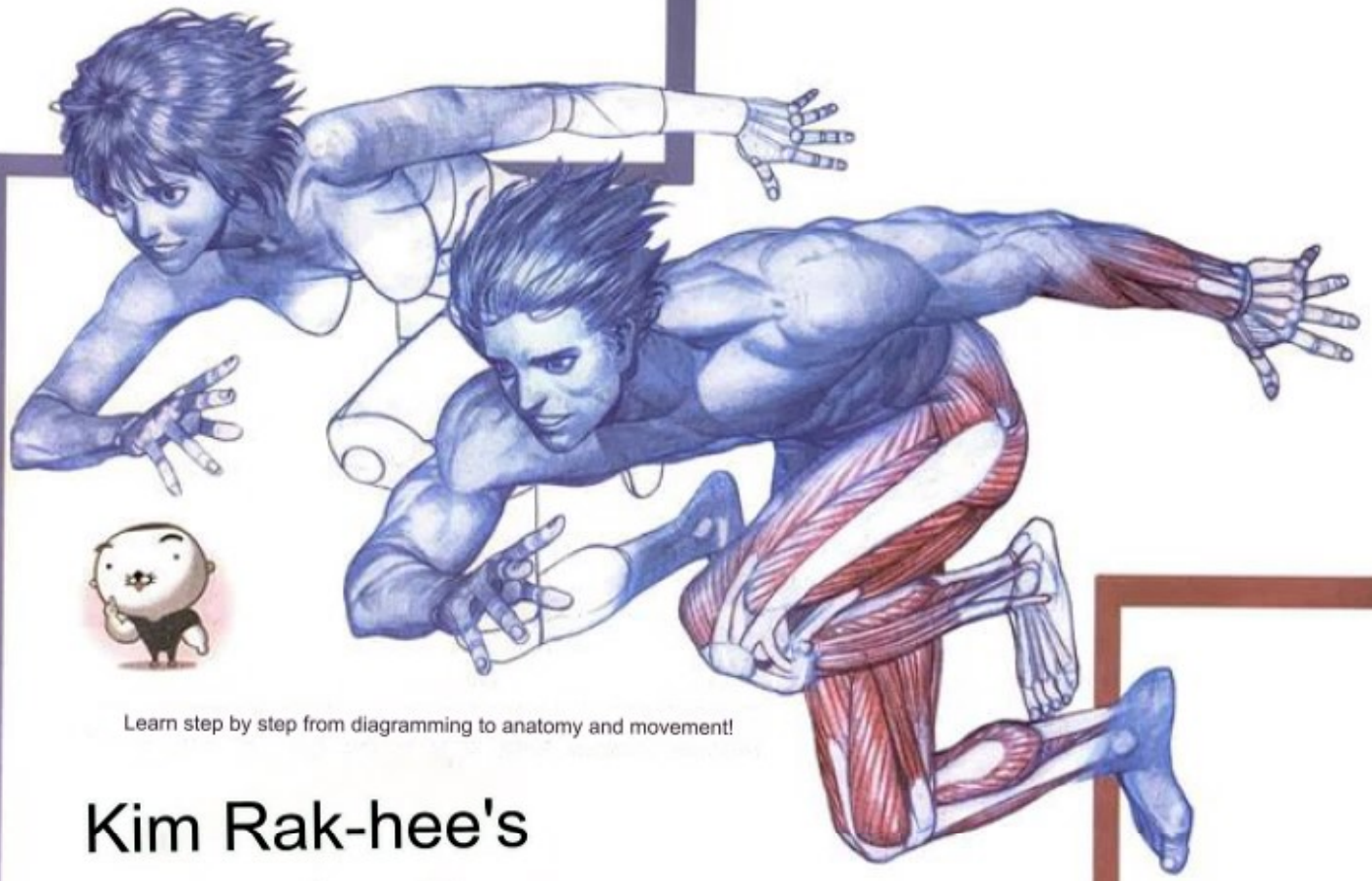


Learn step by step from diagramming to anatomy and movement!

Kim Rak-hee's human body drawing

Written by Kim Rak-hee
윤관현 감수

BM Seongandang

The human body is like the universe.

Greek artists knew this a long time ago. So, all Greek gods were expressed in human form. This means that all literature and art in the world exists in the human body.

The first time I saw Rakhee Kim was a long time ago in a classroom at Sejong University. He was sitting quietly alone in the corner of the classroom, drawing delicately with a pencil, and it was dazzlingly beautiful to see him immersed in the drawing.

Rockhee was not a genius

Before I knew it, I was starting to resemble a genius. It was a happy thing to live and see a little genius. However, it took a lot of time for Rakhoe to present his paintings to the world.

Now the little genius has revealed all his know-how and created a book.

Like the martial arts vision of an absolute master that has never existed before in the world of martial arts, this book will present a new world of human body drawing to many artists.

Even for me, who did not major in human anatomy, this book was the best gift.

I wish this little artist all the glory and blessings in his future.

2019. 11. Lee

Hyun-se

I first heard the name 'Kim Rak-hee' around 2015. It was the time when I was writing the final stages of <Sakyamuni's Anatomy Notes). Since I am not a medical major, I had a lot of worries ahead of the deadline, but around the same time, I came across Kim's work on the <Fantastic Four> comic book during a work meeting with a Marvel representative. Although I didn't make any effort to show it, it was a shock. I've often seen artists who are good at drawing a single picture. This is because masters who freely manipulate realistic human bodies in numerous cuts are extremely rare. I felt both admiration as an anatomy book author and enthusiasm as a writer in the same industry. If only I could have this author's know-how!

Even if you are a master of anatomy, not everyone can draw well. The artist's own secrets, which he learned on his own by facing countless blank sheets of paper and practicing repeatedly in practice, are different from the realm of simple 'art anatomy.' I had to dig up his know-how somehow. I finished the book in a hurry, and contacted him, whom I had never met, and used all my eloquence to urge him (in fact, it was close to threatening) to publish the book. In the end, he succeeded in getting the publishing company to turn his back on him and it was a huge success.

However, after receiving the edited version, I thought it was a mistake. To be honest, my feelings as I face this book and write a recommendation are complicated. It's difficult because we have to promote it. I hope this book doesn't sell too many. It's because I want this book to be the only one I have.

Seok Jeong-hyeon (Painter. (Author of Buddha's Anatomy Notes))

I remember a long time ago when I saw the manuscript of author Kim Rak-hee's short comic. I was impressed by the expressive power and completeness filled with incredible density, but what was even more surprising was what he said while sharpening a 0.5mm mechanical sharpener with a sharp knife: "Hyung. That's not over yet."

Artist Rakhee Kim's attitude toward paintings is more than that of a fierce perfectionist. His delicate portraits, in which he even memorized the locations of blood vessels, were enough to humble even artists who had studied the human body. This is also why I couldn't help but be filled with anticipation when he first told me that he was going to create a human body textbook.

<Kim Rak-hee's human body drawings) has friendly explanations developed through many years of teaching experience. In addition, it is full of various illustrations that can be used without hesitation, from the basics to those who need advanced courses. Above all, it is even more special because it contains illustrations that help with three-dimensional understanding, which I believe must be included in human body drawing textbooks. Cute illustrations interspersed with learning that may be blunt help understanding. I am very happy that such a wonderful textbook came out of the hands of a close colleague, and I am encouraged by the fact that it can be a healthy stimulus as a fellow artist.

I believe that any creation that expresses people, whether it is writing, painting, or video, is a noble work. I hope that this book will be in the hands of everyone who needs the skills to bring characters to life, including myself, who draws comics.

Younggon Lee (cartoonist)

The first time I saw artist Rakhee Kim was when I was in college about 10 years ago. We were all students studying drawing and comics, but artist Rakhee Kim's method of studying the human body was particularly impressive. While watching bodybuilder videos, I observed the movements of the human body from various angles. It was quite impressive to see him studying while capturing the changes in muscle movement according to the person's posture. I am reminded of artist Rakhee Kim from the time when, even while working on his work, he would always play videos related to the human body on the monitor and repeat visual training with a textbook next to him.

A lot of time has passed and now he has written his own human body drawing book. This book provides easy-to-understand everything from skeletons to graphical three-dimensional expressions. This is an easily accessible method for any posture. The expression of the muscles and skin on top conveys a vivid feeling of movement.

The know-how accumulated over many years as a cartoonist and illustrator instructor is fully incorporated into one book. I am confident that if readers follow this book, they will find themselves with a deeper understanding of the various postures of the human body.

Yoon Jung-geun_Pilmong (illustrator)

I have known my brother for over 10 years, including my time in the U.S., since college in my early twenties. He liked his brother's tenacity and consistency, and while watching from the side, he was one of those people who came to trust him more than anyone else. Knowing that my brother's affection for the human body was unique and that he had accumulated knowledge over a long period of time, I could not help but trust him.

From the first time we met, his sense of professionalism in painting was very special compared to ordinary painters, and it showed in his paintings. However, he is still a writer who is still developing. Although I have been teaching students for over 10 years, I am also a writer who I continue to recommend to my students.

His paintings are a study. Even if you don't rush to study, just looking at it will definitely help. I did that, and I think many people do that. It's helpful. Many people who read this book will also greatly agree with these words. He is helpful.

Inhyuk Lee (illustrator)

Entering

I struggled a lot for a long time while studying painting on my own. Since no one was there to tell me the answer, I asked myself countless times, 'Is this the right thing to do?' Drawing a picture is like facing yourself. You can tell by looking at the picture how much you understand, how immersed you are, and whether you are impatient or calm. Putting your heart into a painting also means that you must have a calm mind to create a good painting. As you go through trial and error and stick to each picture until the end, you will eventually discover it. My self has changed with paintings.

This book consists of how to interpret the complex human body in a simplified form, study the operating principles of human body movement through this method, and apply it to actual drawing. As I systematized the theories I had been researching and created pictorial materials so that many students could understand them, I ended up having the opportunity to study my own basics from the beginning.

The more you study the basics, the more new they become. It feels like I am correcting my rigid posture that is biased to one side without me even realizing it. Studying the basics is not only the first knowledge you learn upon entering painting, but it is also a self-objectification task to shake off bad habits that you must continue to practice even after you become skilled at drawing. It is not a gateway to pass through. It's like stretching that you should always do to maintain your body's balance.

While working as an animator, movie storyboard writer, illustrator, and American comics artist, what I felt in various work sites was that, in the end, 'the basics are the most important' in any genre of drawing. In order to solve the problem of the drawing not coming out as expected or taking too long to draw a drawing I liked, I had to study the human body again.

While teaching drawing students, I was able to see up close what they found most difficult and difficult. There were many different types of concerns, but the fundamental problem was lack of basic skills. The methods taught in this book are not just a means to help you understand the theory, but are also the methods I always use when drawing my works. I hope that this book <Kim Rak-hee's human body drawings will be like a marathon pacemaker that will serve as a guide to give you direction and give you strength again when you get tired while drawing.

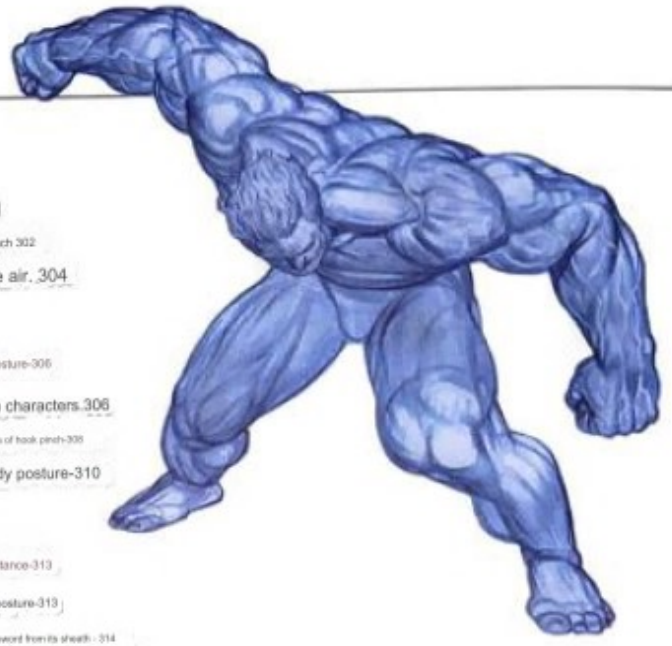
November 2019

Author Rahee Kim

order

04 anatomy in motion

order



05

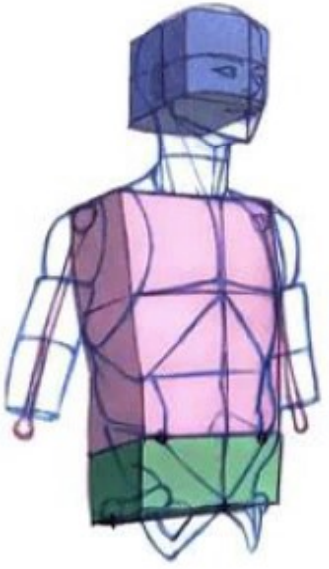
Develop a character

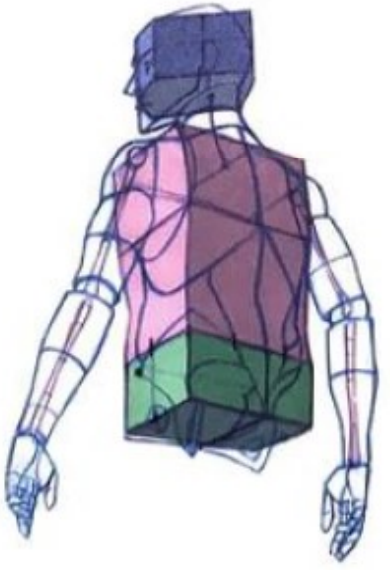
concept based on the basics

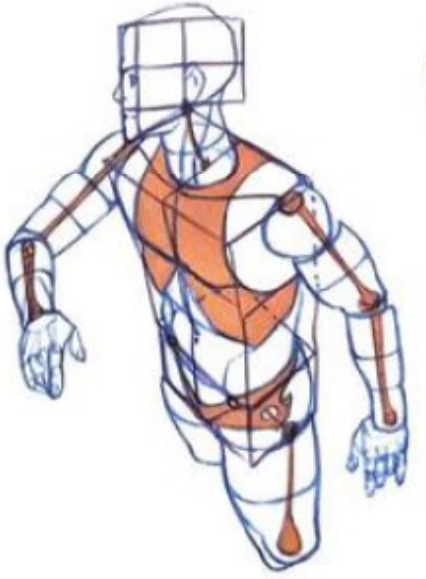
diagram on the skeleton

Just as when you first learn to sing, you practice vocalization first, and when you start exercising, you first develop basic physical strength, SOLID FIGURE 'figure the basic foundation for drawing the human body well. Human figure drawing is not a matter of simply connecting shapes so that they would fall apart if you hit them with a tap, but rather embodies the human body by adding shapes with the flow of the human body on top of an accurate framework, which is like a kind of blueprint.

Through the skeleton, you can check the most basic and important information about the human body: proportion, center of gravity, and movement. You can also study the volume of the body and the overall flow of the human body by drawing shapes on the skeleton. If the skeleton is unstable, the human body will look awkward even if a high-quality description is added. Figure drawing is a very effective way to understand the complex human body three-dimensionally, and it allows you to express various angles and postures by breaking away from flat drawings. In this chapter, we will simplify the basic skeleton of the human body to understand the core operating principles of each joint and add volume using silicone material on top of it. If the skeleton is excluded from the modeling stage just because it is not visible on the outside, or if the appearance is set to resemble a rigid wooden doll, the range of motion of the joints will move differently than in reality and the motion will be limited. Therefore, it is necessary to apply a shape made of soft silicone material on the skeleton that serves as the axis of movement, in order to realize natural movement similar to that of a real person.



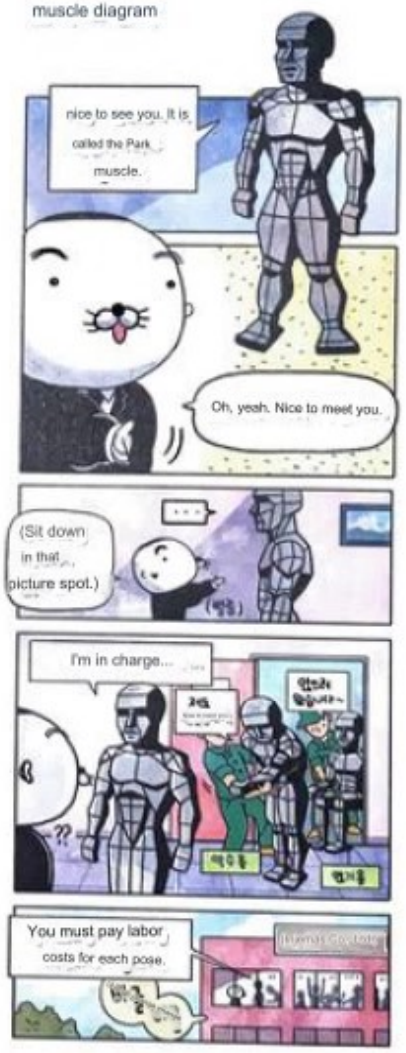




wood carving

flow diagram

muscle diagram



Ellipse geometry

Q&A

I don't know how to study because the shape of the diagrams in each book is different.

"How to simplify the form? Each artist has different interpretations. The important thing is that all movements of the human body must be able to be realized in 3D from any angle. There are no images that are out of sync with the flow of the human body or only work in one posture. , Any diagram that does not express the movement of the character is wrong.

wood carving

Because the number of joints is too small and the material is hard, there are limitations in embodying human body movements.

flow diagram

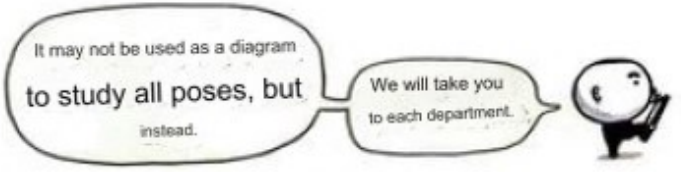
You may develop the habit of adding exaggerated flow to all postures or deforming excessively.

muscle diagram

I can't understand the principle of movement and the form is too complicated.

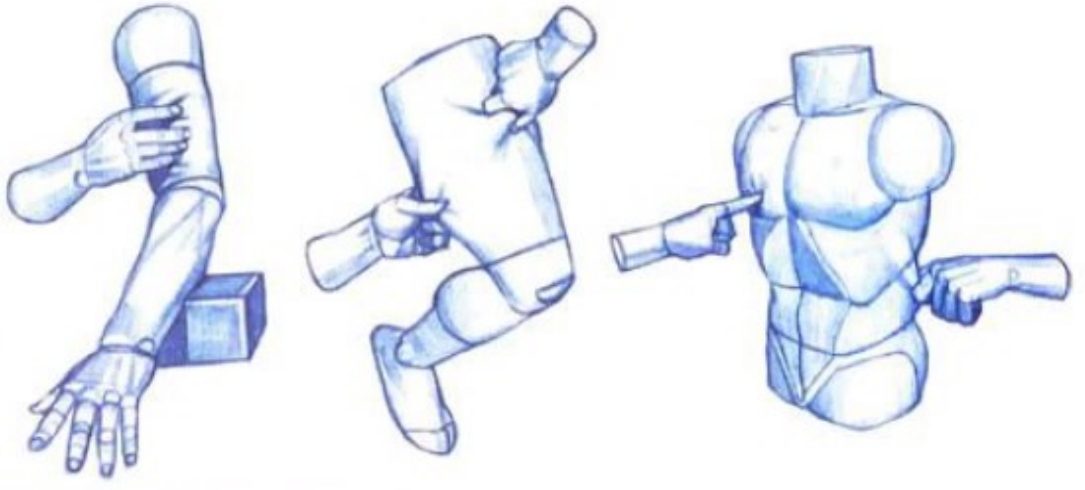
Ellipse geometry

The boundaries between front, side, and back are ambiguous. The form is too simple to theorize.



The material of this shape is hard, so the surface is not pressed or stretched, and the outline is expressed in an oversimplified flow, making it unsuitable for use as a human body shape.

The surface of this shape is made of a material that stretches or presses like our skin, and the large flow of the human body is well expressed, making it suitable for use as a human body shape.



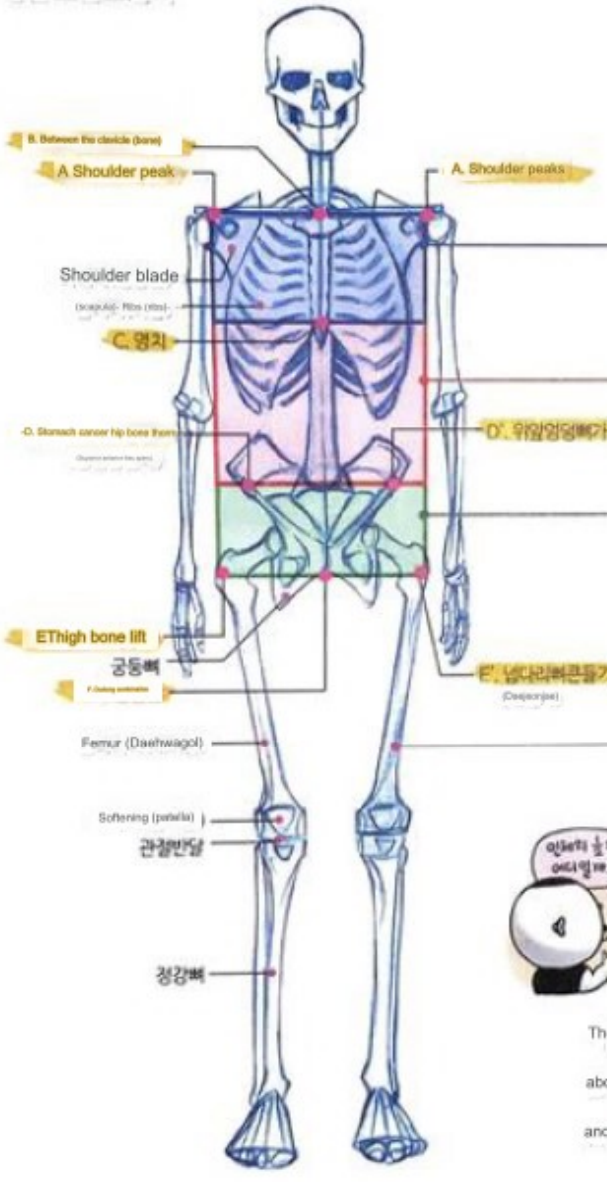
Because of the hard feeling that the word 'shape' often gives us, it is easy for us to perceive a shape as a solid object with a fixed shape. However, if you think of the human body as an oversimplified figure, it becomes confusing when drawing because the volume of the figure is different from the flow of the actual human body.

The shape we will use is made of a soft material on the outside and a hard skeleton on the inside, just like the actual human body. The joints are not made like the joints of a toy, but are a simplified form of the bone joints of the actual human body, allowing the movement of the human body to be realized. The shapes do not collide with each other and make an 'angling' sound, but when pressure is applied, they are pressed and when pulled, they stretch. In other words, it is not a sphere and a cylinder joined together, but a shape that shows the large flow of the human body.

'Figure drawing' is often neglected as it is considered only a basic practice method. After drawing it a few times, I think I understand it well and move on. It takes a lot of research and practice to draw human figures in accordance with proportion, volume, center of gravity, and natural movement. Since the human body shape has the same structure as the actual human body, just erase the lines at the joints where the shapes are connected and the human body will appear immediately. Human figure drawing is a necessary study method for everyone, from beginners to experienced students.

■ Grab the front point

In this book, we will focus on the 'torso box', which is the basic frame of the human body shape. For convenience, I will call them by adding the numbers 1, 2, and 3 to the boxes.



Box 0 (chest)

Draw the top of the box by connecting A, B, A' horizontally. C is located in the center of the bottom of box 2.

Box 2 (waist) This

is the box that undergoes the most deformation due to bending and rotation of the waist.

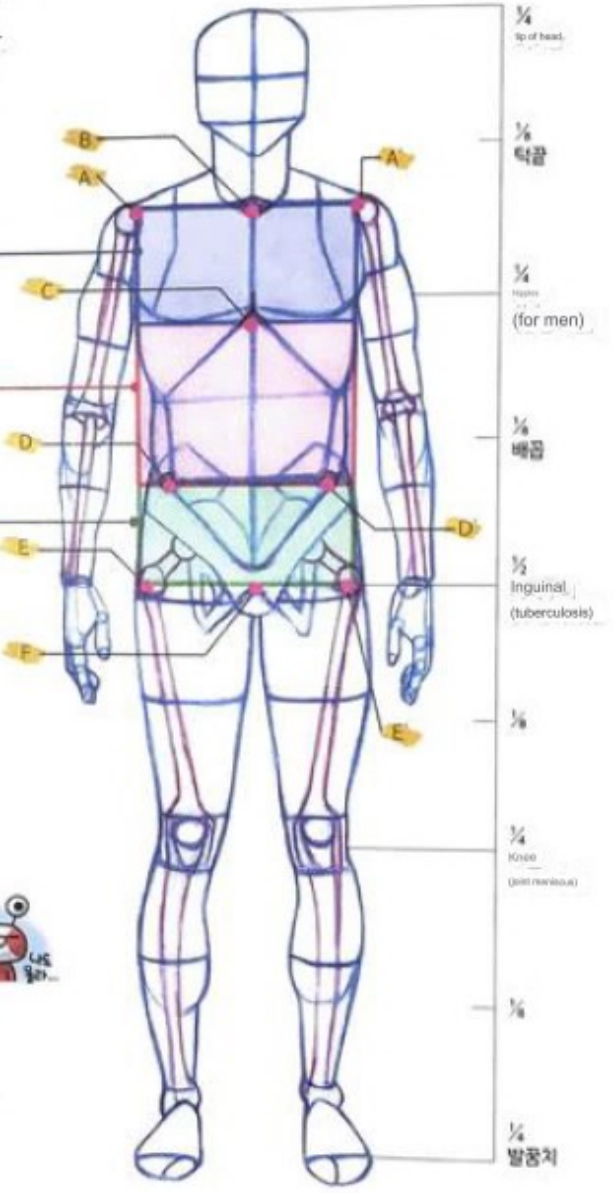
•Bun box (pelvis)

D and D' are located slightly inside the corners of the box. If you lower A, A' vertically, it meets E, E'. It is at the center of 'FEE'.

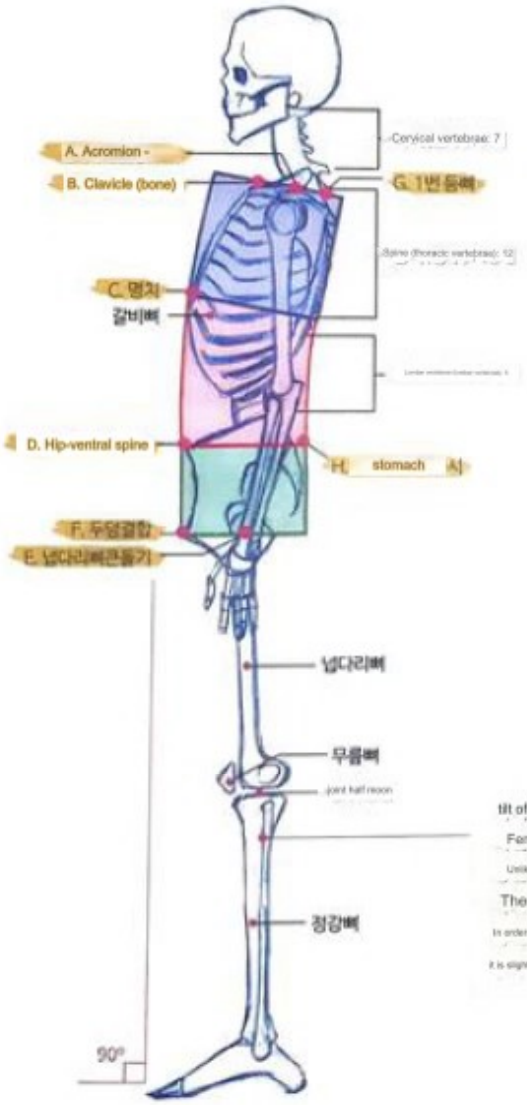
tilt of the leg bones

When standing at attention as shown in the picture, the femur is bent in the direction of the eye and then becomes vertical at the tibia.

The proportions shown on this page are looking at the person from a distance, about shoulder height. The distance between the looking eyes and the object and the position of the eye level change the proportion.



■ Grab the side points



The spine consists of a total of 24 segments: 7 cervical vertebrae, 12 thoracic vertebrae, and 5 lumbar vertebrae. There is a lot of movement in the neck and lower back, but the spine does not move much. It moves slightly when you lean, bend, or twist your body, but compared to the cervical and lumbar vertebrae, it moves little.

Box 0 (chest)

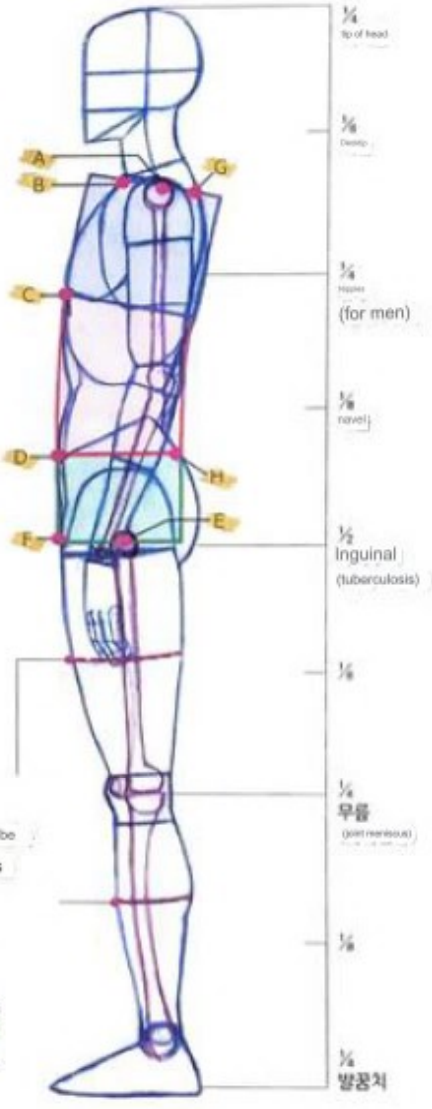
G is the 1st thoracic vertebra, located just below the 7th cervical vertebra, which protrudes prominently when we touch the back of the neck. A, B, and G are on the same line, and A is located slightly closer to the east rather than in the exact center of the box.

•Bun box (waist)

The bun box is connected from box 2 to box 2, forming a slight curve, as shown in the picture.

Box 0 (pelvis)

• Back: Connected horizontally from D to H, the point where the upper and posterior buttocks come out. • Height: In men, D and F are perpendicular to the ground. •Bottom: F and E are located on the same line. The position of E corresponds to a point on the whole body.



tilt of the leg bones

Femur and tibia viewed from the side

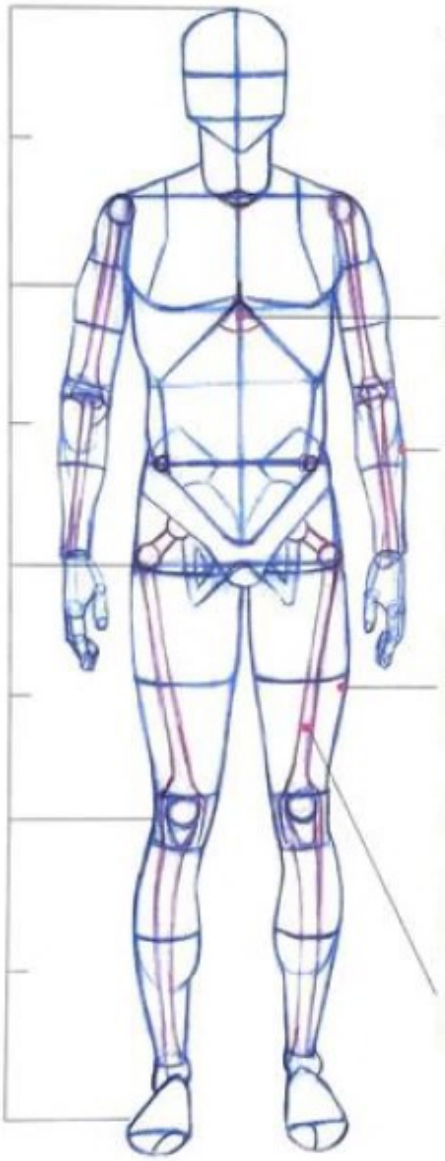
Unlike the front, they are connected in a straight line.

The overall tilt of the leg is in order to balance the center of gravity of the upper body. It is slightly backward rather than perpendicular to nature.

parabola

These parabolas at each node describe the tilt of the body regardless of proportion.

▪ Men and women front view



When studying the male and female bodies

Practicing with men and women of the same height allows

you to compare body differences more clearly.

Differences in angle between men and women

The angle of rib opening is greater in men than in women.

Differences in arm bending angles between men and women

When the arm is lowered comfortably, the elbow

bends outward in men and inward in women. This difference

is caused by the thickness of the muscles around the

armpits.

In men, the thickness of the thighs decreases rapidly from

the knee due to muscles, while in women, the thickness

of the thighs gradually decreases with a smooth flow.

The legs of female athletes with developed muscles show

the same flow as men.

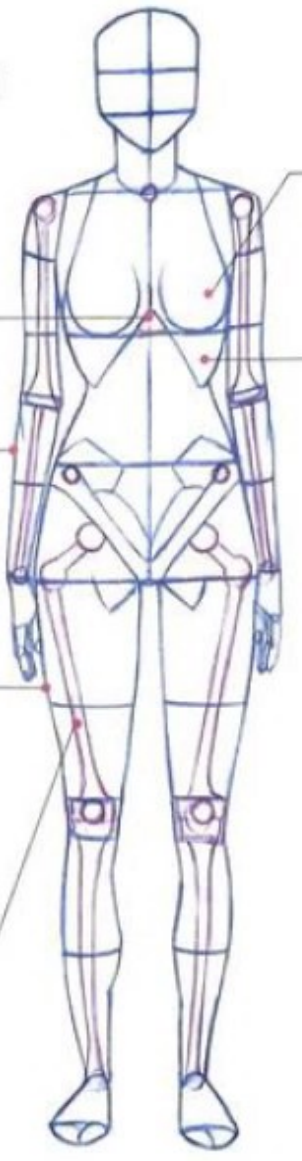
넙다리뼈

Compared to other parts of the human body, the location of the

femur when viewed from the front is not in the center of the

body, but rather leans outward. This is a common characteristic of both

men and women.



female body proportions

The point of human body proportion is slightly above

the middle of the body for both men and women. For

men, this point is the same as the nipple, but for women, the chest

is lower than that of men, so the point is located slightly

above the nipple.

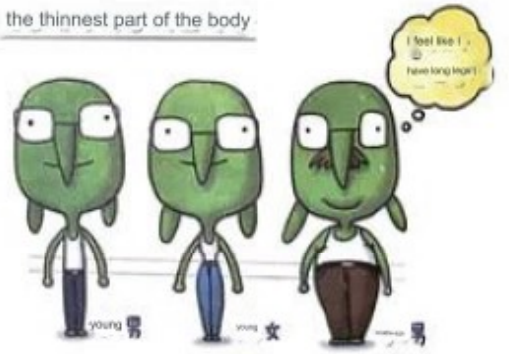
Differences between male and female ribs

Men's ribs are wider than women's, and

women's ribs become narrower than

men's as they go down to the bottom.

the thinnest part of the body



When men wear pants, they tie a belt around the pelvic

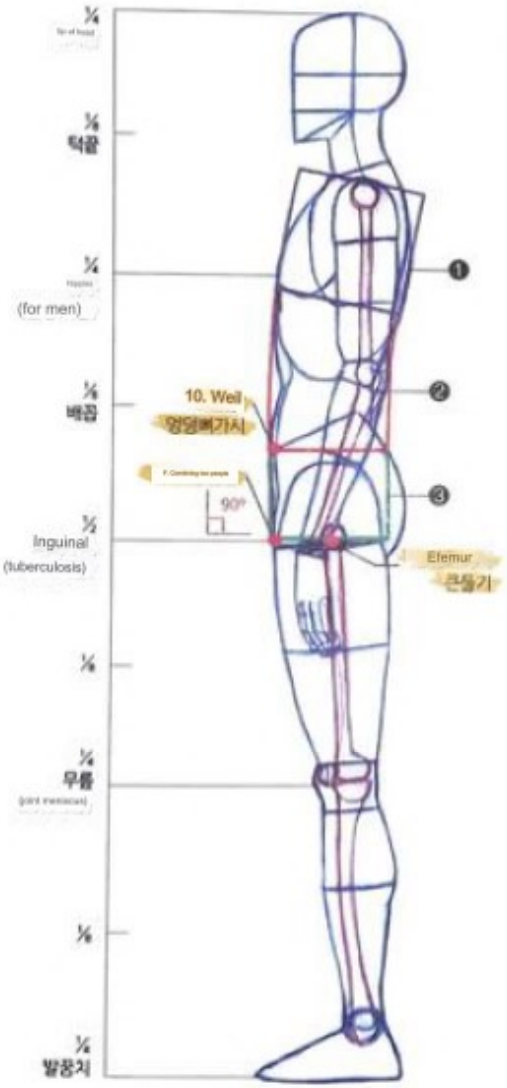
bone line. Because women have the narrowest ribs at

the point where they end, they can wear so-called 'belly

pants' with pants that rise above the navel, making their

legs appear longer than men's. Men can wear belly pants

only when their stomachs are exposed.



Q&A

Why is the spine curved in an S shape?

When we walk or run, when we put our feet on the ground, our body is pressed in the direction of gravity. At this time, the shock can be alleviated thanks to the spine being bent like a spring. If the spine were straight like a pillar, the shock would not be cushioned and it would break.

•Slant of the box (chest)

When you stand still, your body leans back slightly, so the box also tilts backwards. Women's upper bodies lean further back than men due to the weight of their breasts.

The thickness of box 2 (waist) and the width of the side boxes are the same for men and women.

•Inclination of the bum box (pelvis)

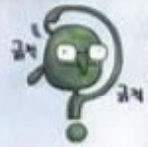
For men, the angle from D to F is vertical, and for women, it is tilted forward rather than vertically to balance box 2.

E is located in the center of the bottom of box 2.

Proportion of the box

In order to accurately represent the volume of the torso, it is very important to look at photos on a regular basis, find the point of the box, and practice drawing the box.

Q&A



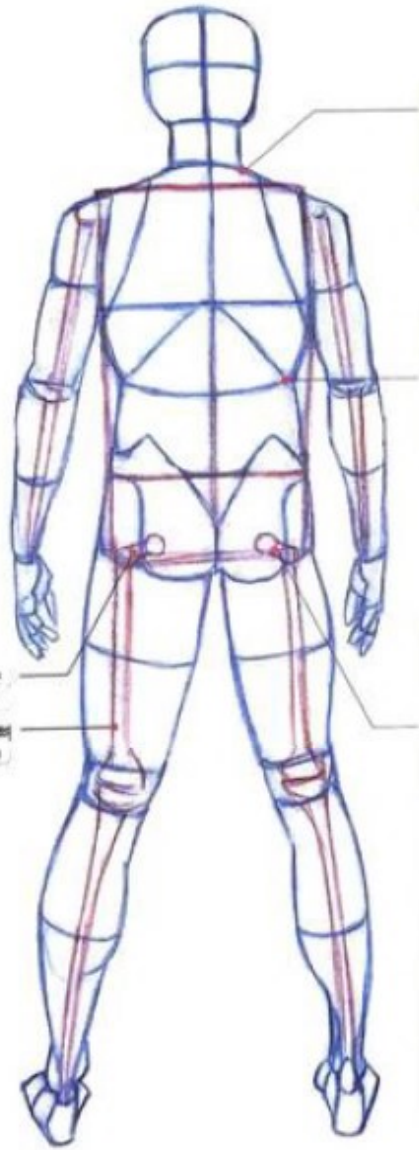
I can't figure out the length of the arm when I draw it.

When you stand at attention, your wrist touches the greater protuberance of the thigh bone, which is a point on the entire body. It will be easier if you use this as a guide to determine the length of your arms.

joint size

For women, please draw the joints of the bones in small sizes.

■ Men and women rear



Femoral neck
(femoral neck)

넙다리뼈
(Daehwagol)

Trapezius muscle (trapezius muscle)

In men, the height of the trapezius muscle is higher than in women due to developed muscles. In women, the trapezius muscle is lower than in men, making the joint look longer.

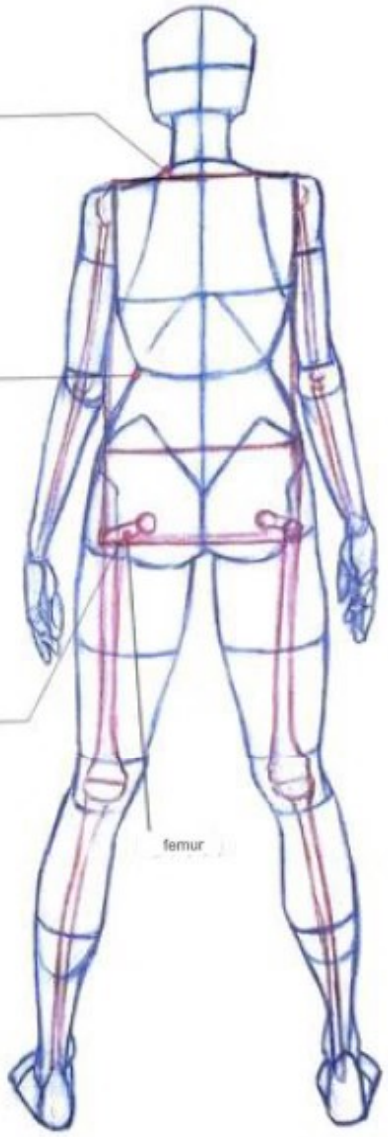
음통

Men's side lines are straight, while women's small ribs and hips contrast, creating a concave flow in the middle.

Is the reason women have big buttocks solely because their pelvic bones are large?

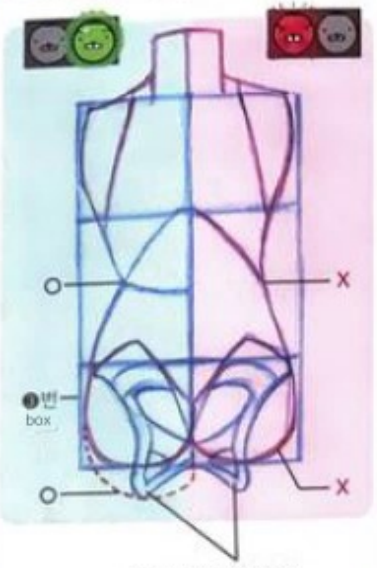
Although women's pelvises are larger than men's, the difference is not as big as you might think.

The reason why women's buttocks look bigger is not only due to the size of the pelvis, but also for comprehensive reasons such as the angle of the thighbone being bent more than that of men and the distribution of fat in the buttocks due to the influence of female hormones. Additionally, women have the characteristic of having a gap between the groins due to the angle of the femur.



femur

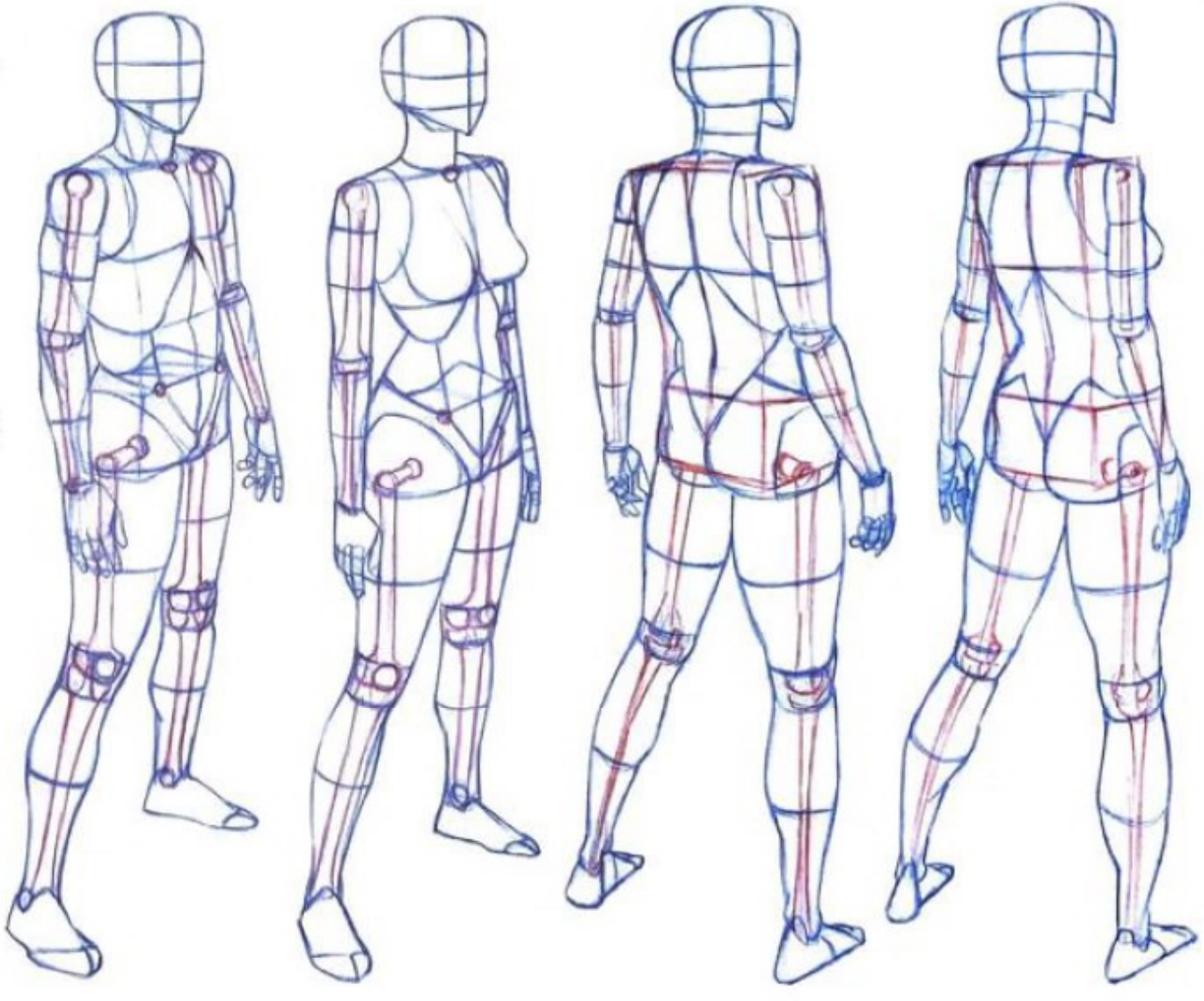
오답노트 Women's waist and hips



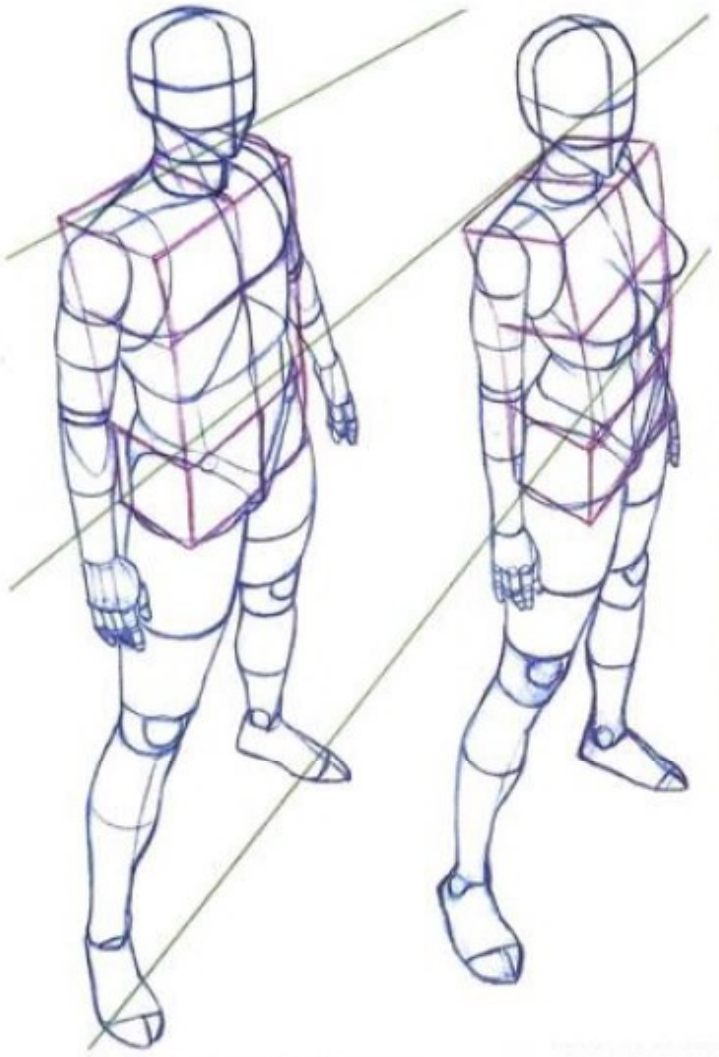
1. To express a woman's narrow waist
The flow of the waist is too curved.
Rather than drawing, the ribs end
The angle changes at the point where the pelvis begins.
It's a good idea to save points.

You can't stuff your butt into box 2.0. The buttocks stick out of the box the length of the lower part of the handle-like branch under the pelvis. This is a common characteristic of both men and women.

It is often easy to think of a stable center of gravity as 'vertical'. If an object is tilted or curved, its center of gravity feels somehow precarious. However, the flow of the human body is created according to the curved shape of the spine mentioned earlier. The information needed when drawing a hemilateral view includes, firstly, the angle of the bone seen from the front and side, secondly, the thickness of each part, and thirdly, the flow of movement. If the half-side is not drawn well, it is due to a lack of understanding of the front and side, so take a close look at the front and side information again!



■ High angle and low angle for men and women



◂ High angle

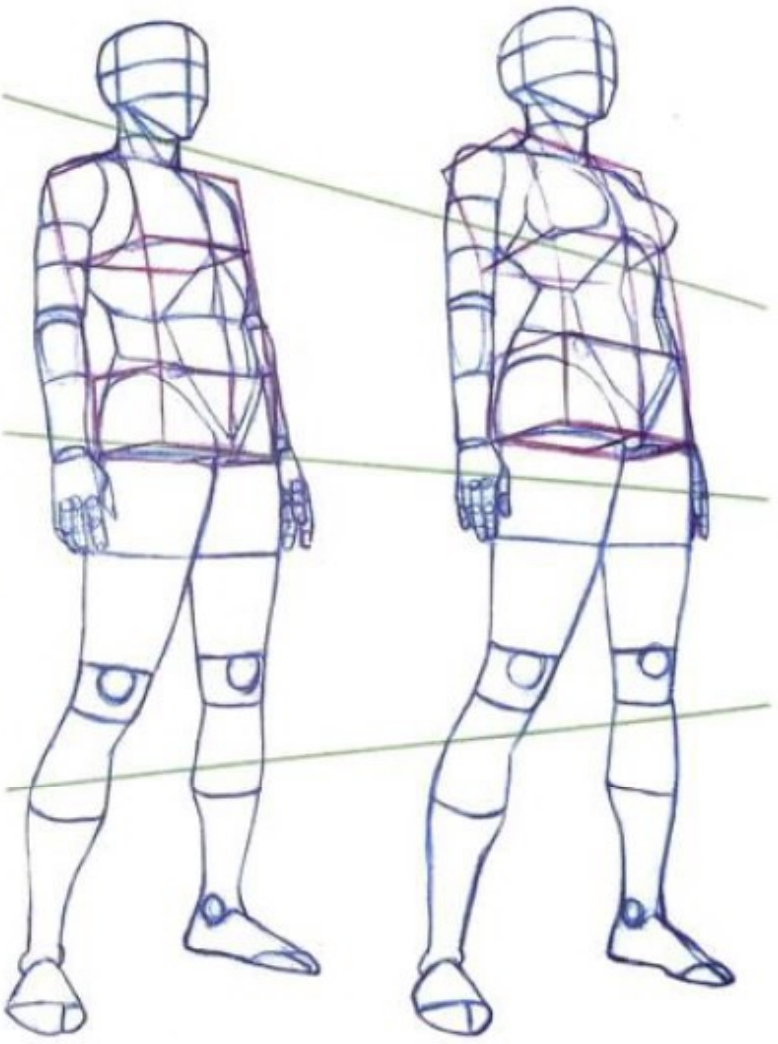
It is important to cover parts of the body by overlapping the face and neck, and to apply perspective while maintaining proportion and volume of the entire body.

torso flow

You can see that the body is tilted back both at high and low angles.

Low angle>

Many students find low angles more difficult than high angles. It's because I have a habit of drawing the face first, or because I don't study the lower body more than the upper body. To draw low angles well, studying the lower body is especially important.



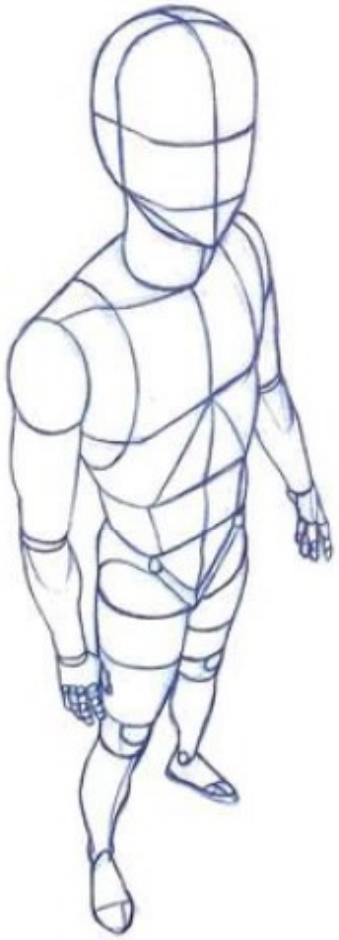
At high angles and low angles, the proportions of the human body change depending on the viewpoint, making the application of equal division complicated and difficult. From this point on, the proportions of the human body must be adjusted by feel, but space must not be determined by feel. If you draw the character first without considering the space at all, or roughly get a sense of the perspective line, there is a high chance that the human body will be drawn at an angle that does not match the angle. After clearly setting the eye level, it is important to create space and draw the human body according to the slope of the lines leading to the vanishing point.

■ Common mistakes with high or low angles

Incorrect answer number 2, the drawing exaggerated the perspective, making the head larger and the body drastically smaller.

For the picture with incorrect answer number 2, neither high angle nor low angle could be used and it was drawn only from a normal perspective.

2. Incorrect answer number 2: Drawing too distortedly or failing to change the angle at all, as shown in the picture, is due to the habit of drawing by feel. We need to study 'space' before the human body.



•Incorrect answer picture

This is a characteristic often seen in my son, who draws only figures without setting up a space. If you get into the habit of drawing only people without a background at high angles and low angles, you will get caught up in excessive perspective and end up drawing people who draw off even when you don't intend to. This character is also likely to be drawn with an incorrect sense of proportion and exaggerated perspective.

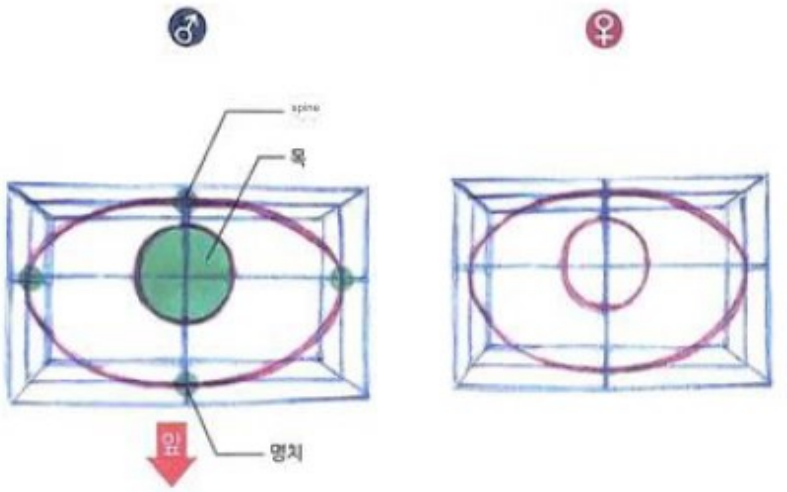
① Wrong answer picture •

I tried to draw a low-angle figure with the eye level close to the position of the feet, but I was unable to change the perspective boldly, so the figure was drawn in proportion from the normal perspective. It's the opposite of the wrong answer picture in number 2, but the solution is the same. After creating a space by setting the correct eye height, you must draw the person according to the theory to break away from the habitual proportions and draw the human body at the desired angle.

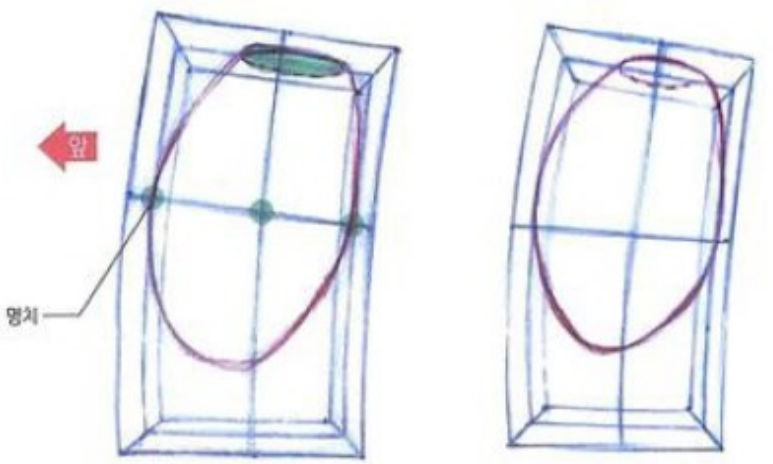
Steps to study pictures

Beginners learning to draw often try to express impactful postures or angles without having the basics in place. However, the point that should not be missed when learning drawing is that drawing is an 'applied subject'. Addition when learning math. Just as you need to understand the basic theory of subtraction to be able to apply all numbers to come up with an answer, the basics of drawing should also come first.

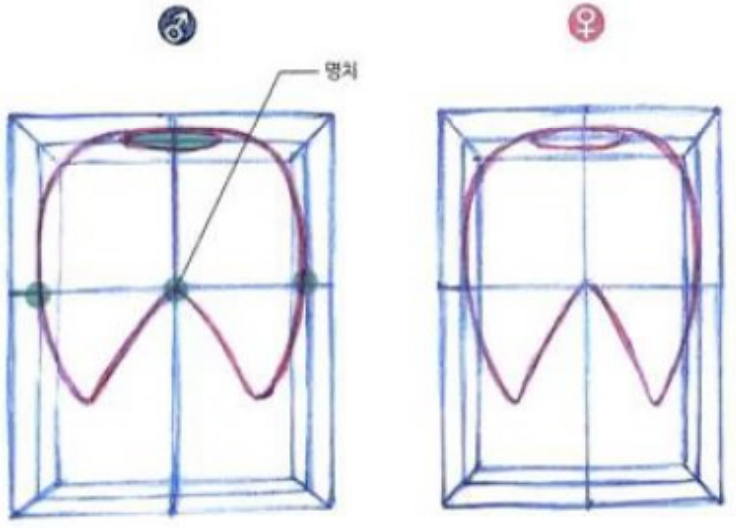
Chest cage (ribcage) in 2 boxes



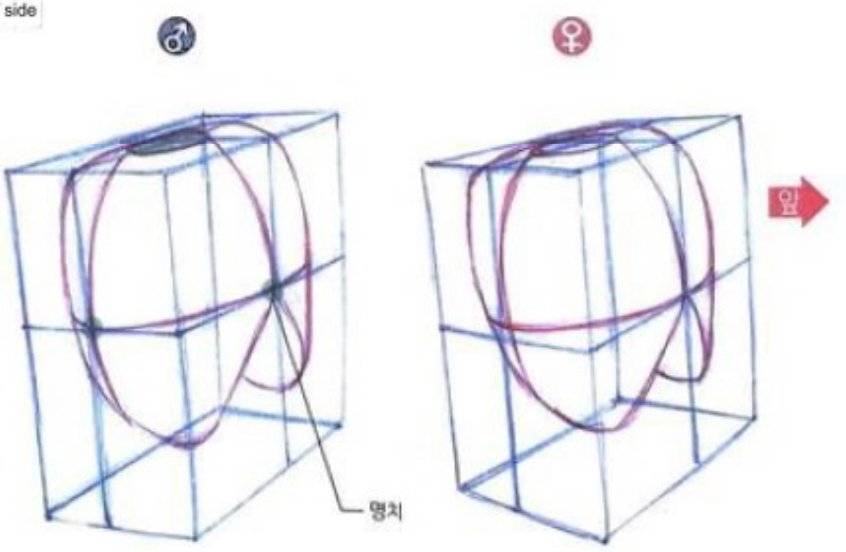
■ side



■ front

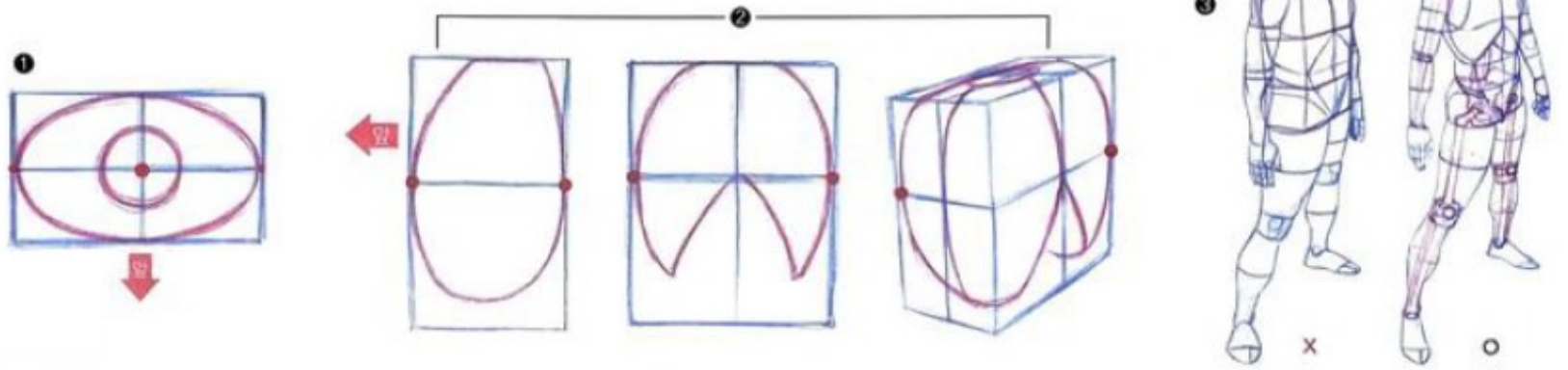


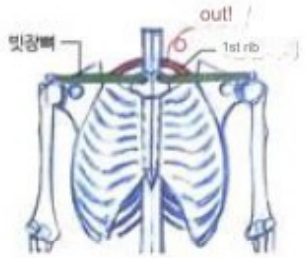
■ Half side



오답노트 Shape of chest cage

Picture number 2 is incorrect because the neck is located in the center of the box. The position of the neck should be close to the back. The point where both sides of the chest cage touch the box should also be slightly tilted to the back. ※If you fill the chest cage according to the outline of the box as shown in the picture, your torso will become fat as shown in the wrong answer picture in number 2.



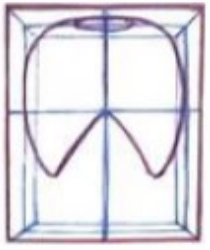


Shape of chest cage

The chest cage shape excludes the part where the first rib rises above the clavicle. The upper part of the ribs is covered by the trapezius muscle, so it does not affect the outline of the body, and the clavicle was omitted to use it as a reference for creating the top of the box.

In reality, the ribs become narrower as they go up.

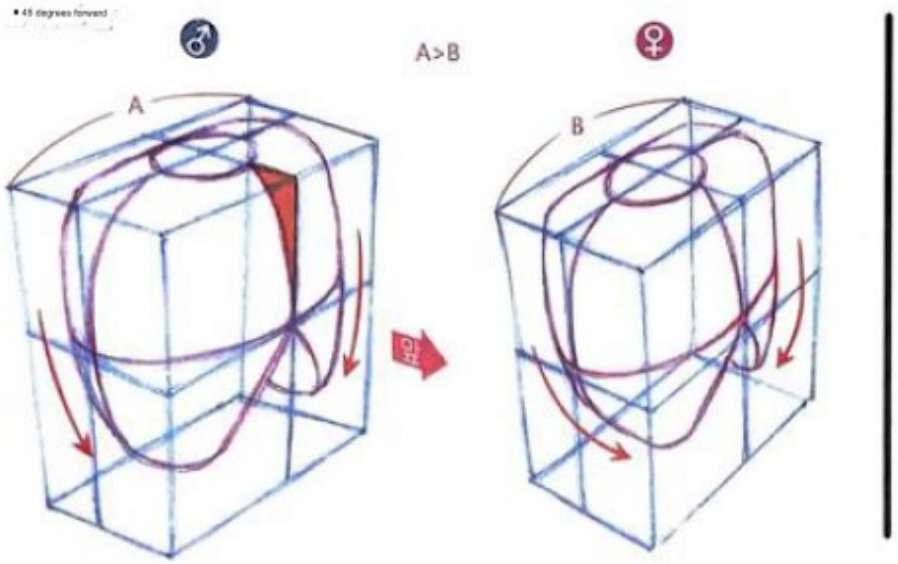
Therefore, the actual ribs and the graphical ribs do not have exactly the same shape.

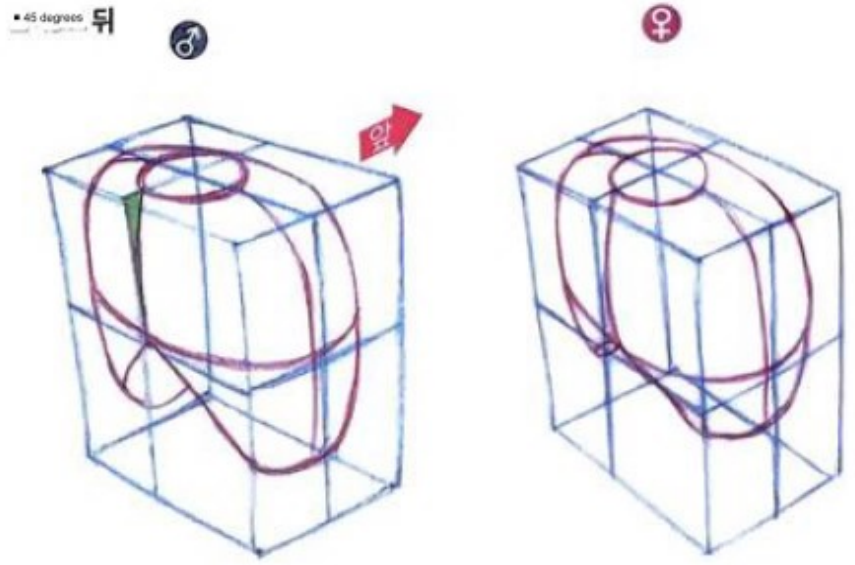


depth of the box

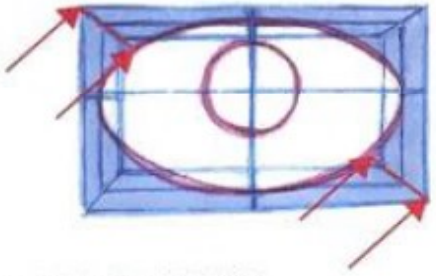
In order to accurately draw the volume of the chest cage within the torso box, you must not think of the box as two-dimensional. You must understand three-dimensionally that there is an oval-shaped breast cage inside a six-sided box.

Considering the hidden people, we create a three-dimensional box with depth.





The lateral width of the male box is wider than the lateral width of the female box, and towards the bottom, women's ribs become narrower than those of men.

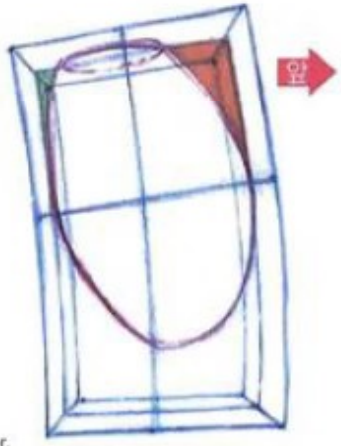


Recognizing empty space in corners

Because a circular object is placed inside a square box,

the corners of the box become empty. From the half side

view, the gap between the edge of the box and the ribs appears wider.



Difference between the front and back of the chest cage shape

If you look at the chest cage shape from a side angle,

the front shape is curved, resulting in a curved shape

The back shape is straight

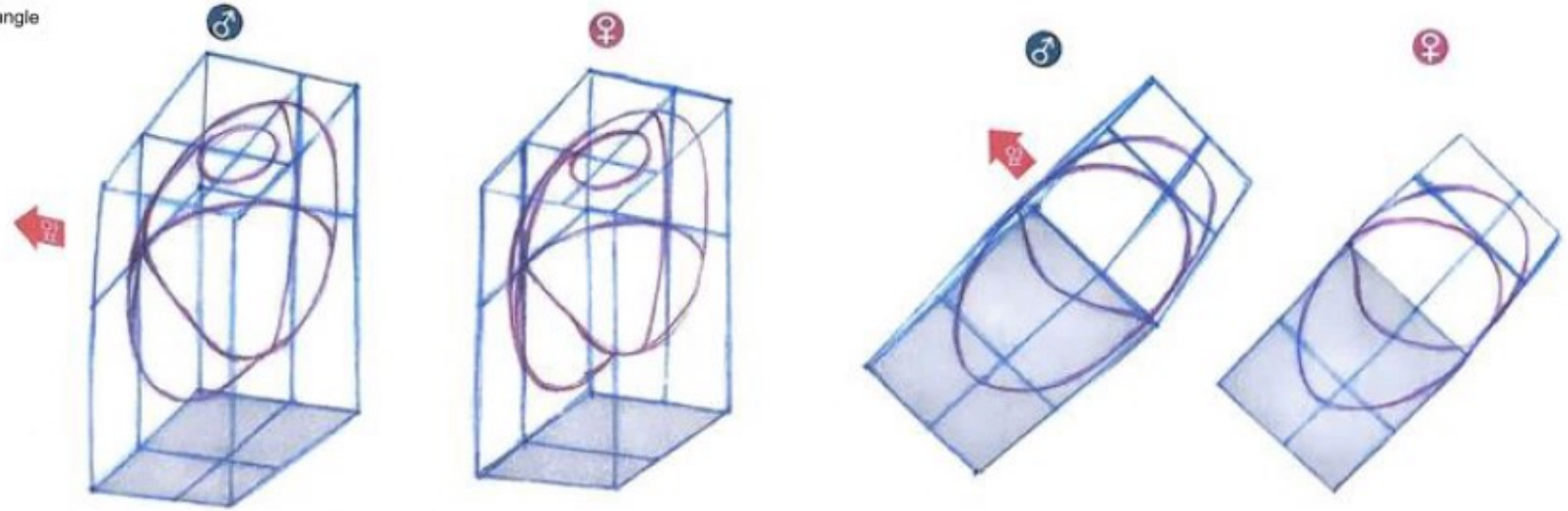
You can see it.

between the front and back of the box.

There is a difference in the empty space

Please be careful!

❙ | low angle

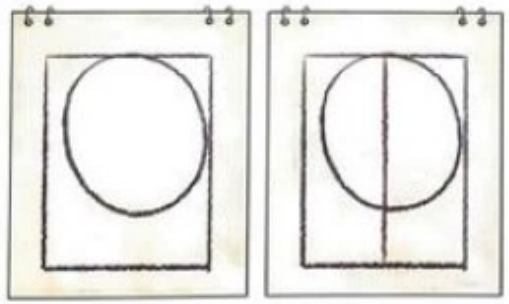


Advantages of using box throttle

If you hold the box throttle, you can clearly see at what eye level and in which direction the oval ribs are facing through the angle of the box and draw them. Also, when drawing the hidden neck or opposite shoulder joint, you can pinpoint the exact position by passing through the box.

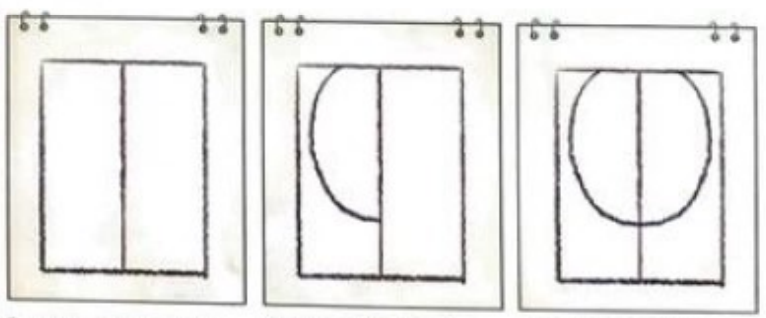
오답노트 How to draw a chest cage (hongkwak)

wrong order |



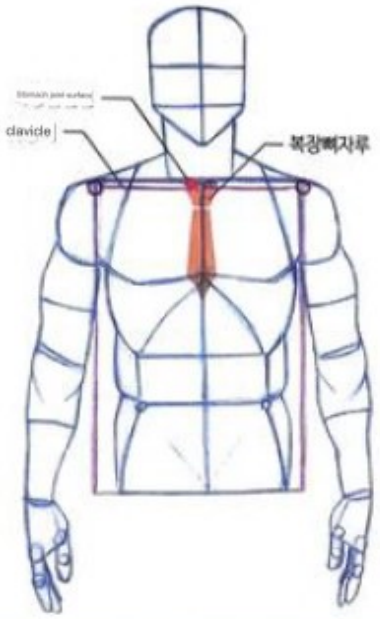
❶ Draw a chest cage inside the box. ❷ Draw the center line of the box.

correct order



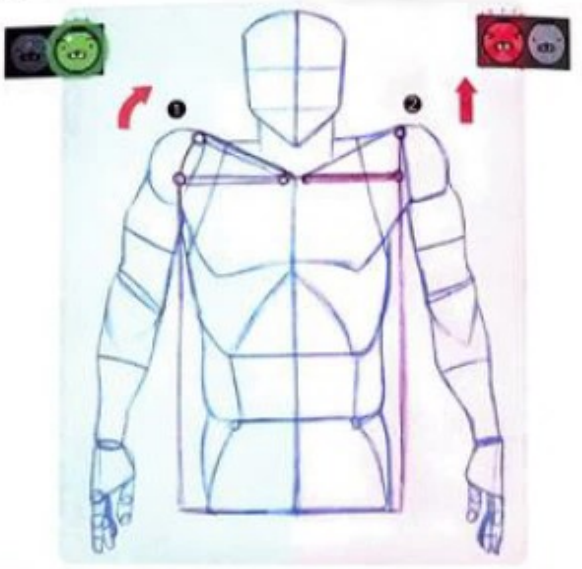
❶ Draw the center line of the box. ❷ Draw a breast cage on one side. *Draw the opposite side for symmetry.

3 The clavicle (bone) moves along the shoulder

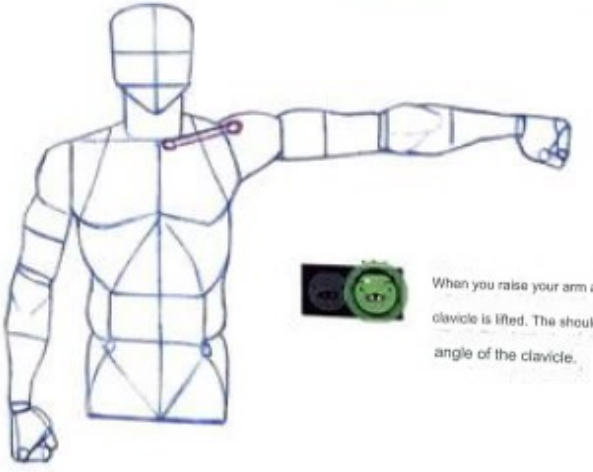


오답노트 Movement of the clavicle when lifting the shoulder

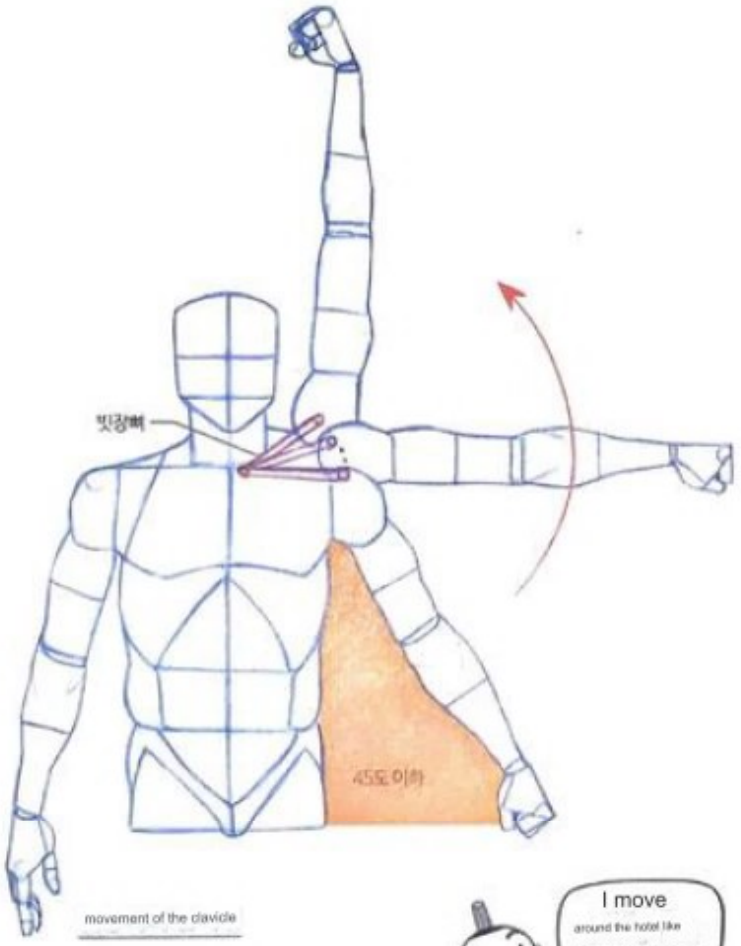
If you shrug and lift your shoulders, your shoulders will rise in a parabolic curve like in number 3. The shoulders do not rise in a straight line like in number 2. Since bones do not change length due to movement, the clavicle only changes its angle around the sternal joint plane, which connects to the sternum.



오답노트 Movement of the clavicle when raising the arm

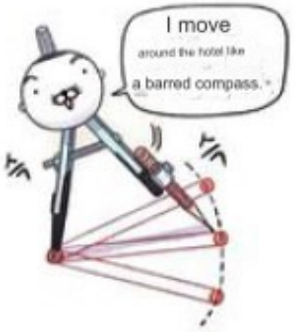


When you raise your arm at a 90-degree angle, your clavicle is lifted. The shoulders also rise along the angle of the clavicle.



movement of the clavicle

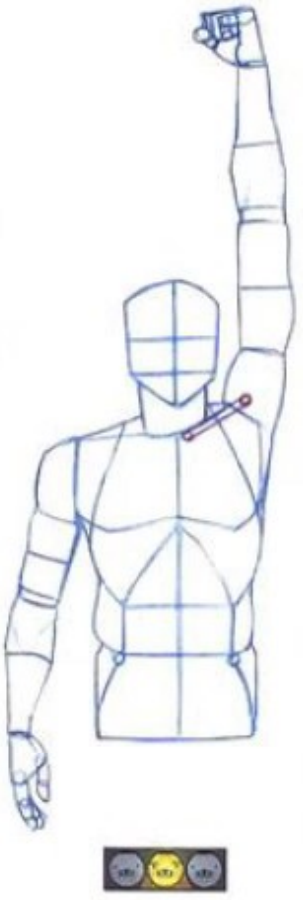
Unless you intentionally move your shoulders, your clavicle does not move when you open your arms to 45 degrees. The point at which the clavicle rises is above 45 degrees.



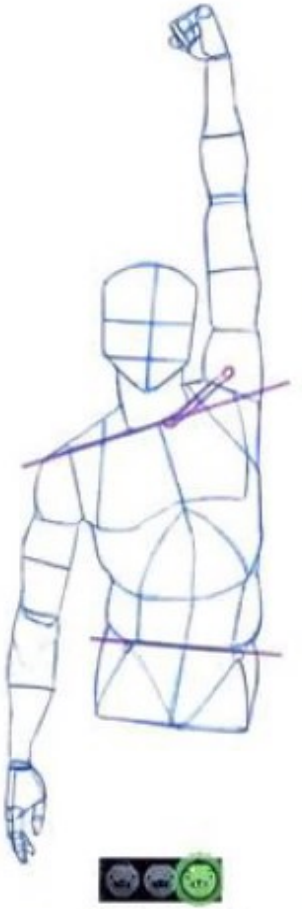
오답노트 The most natural movement to raise your arms

When you raise your arm, your clavicle is fixed and if you only move your shoulder, it looks like a toy.

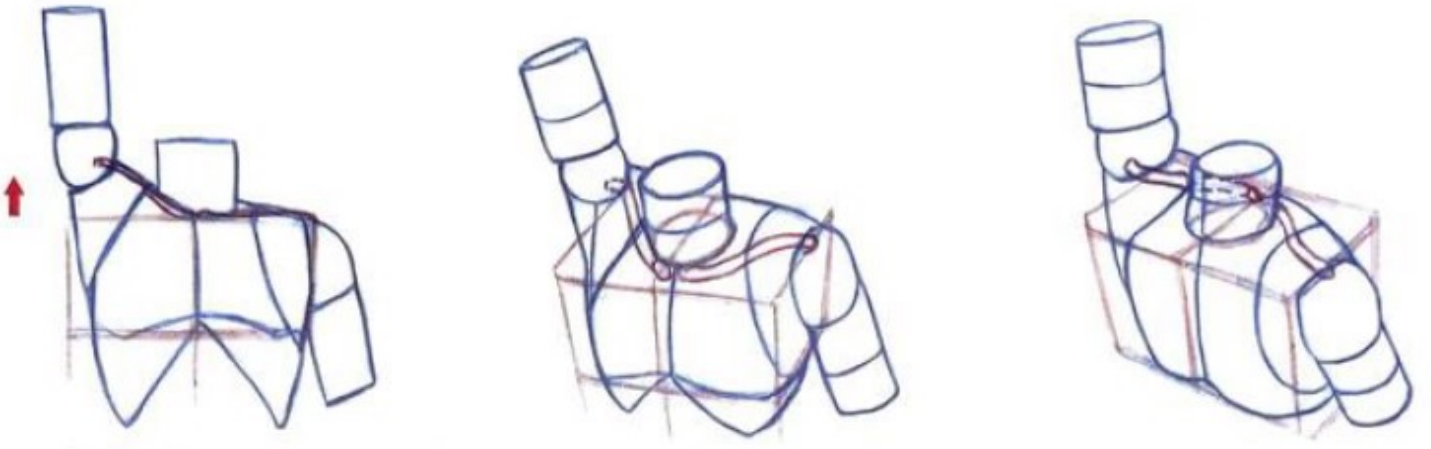
This is the most common mistake.



If the torso does not move when the arms are raised, the overall flow of the human body becomes unnatural.

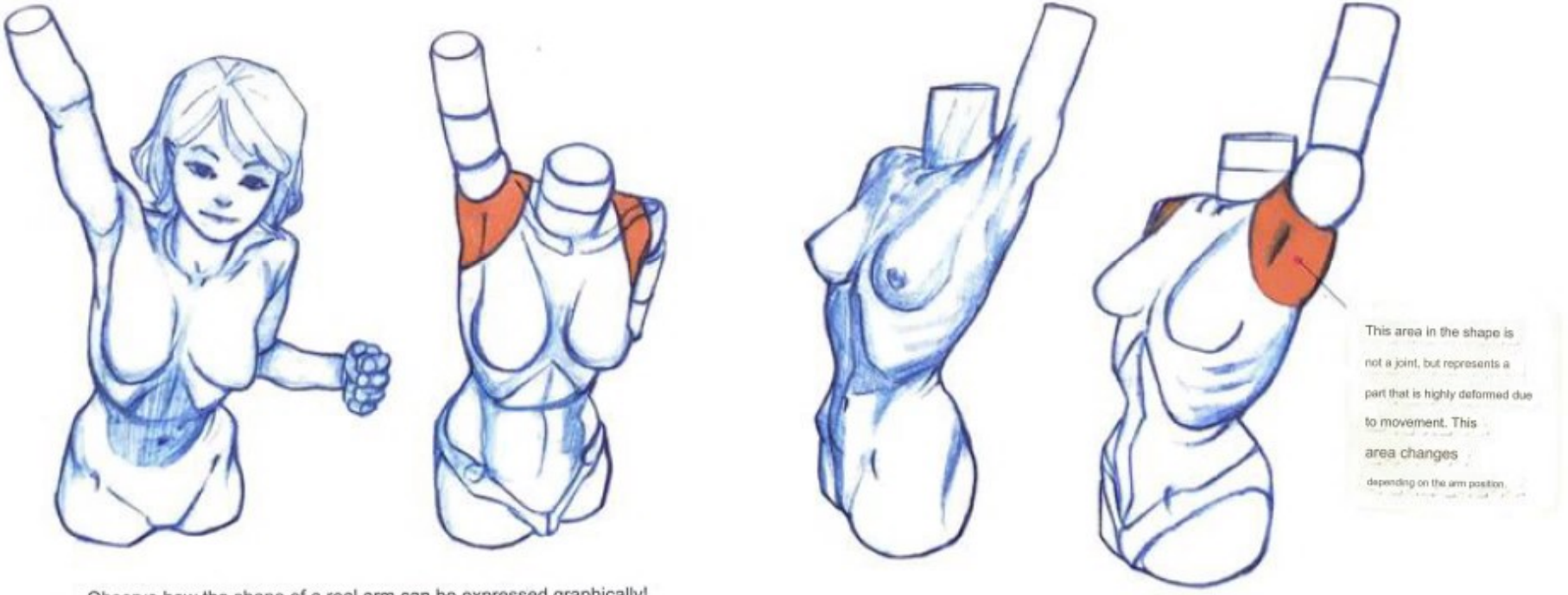


As the arms rise, the shoulder tilt and pelvic tilt intersect, creating a natural movement.

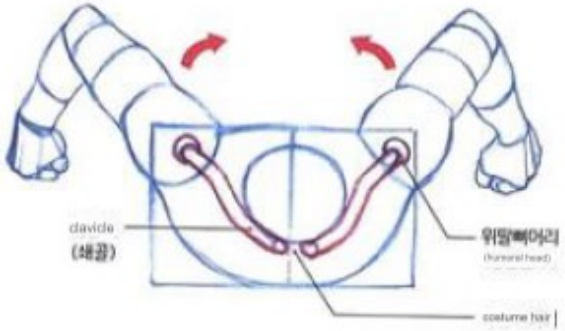


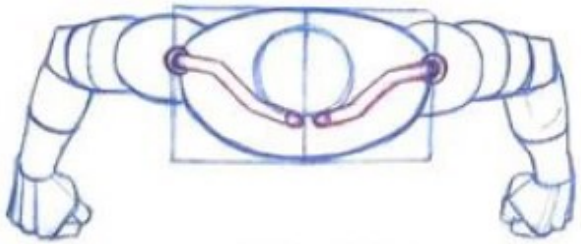
Appearance of the clavicle when the arm is raised at each angle

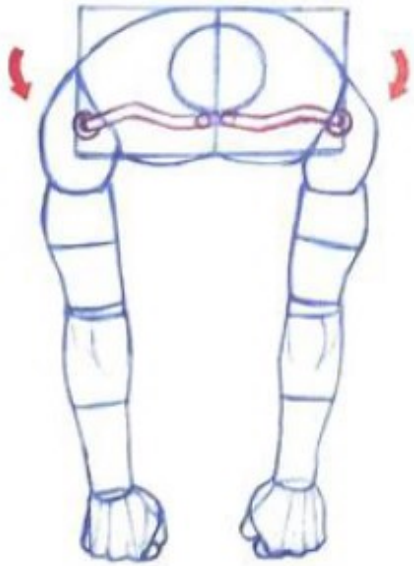
When you raise your arm, you can see that the end of your clavicle moves to the east.



Observe how the shape of a real arm can be expressed graphically!





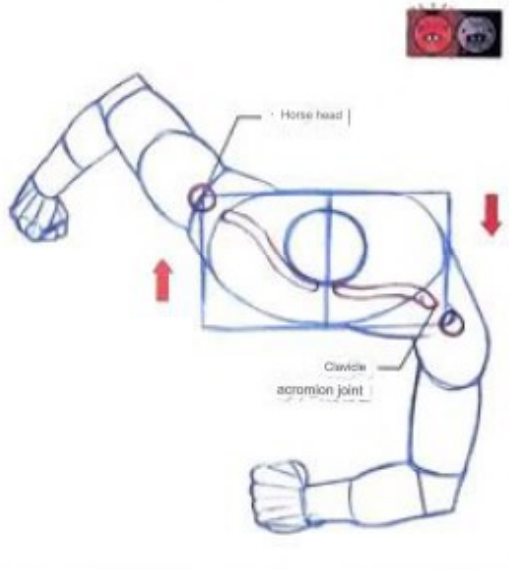


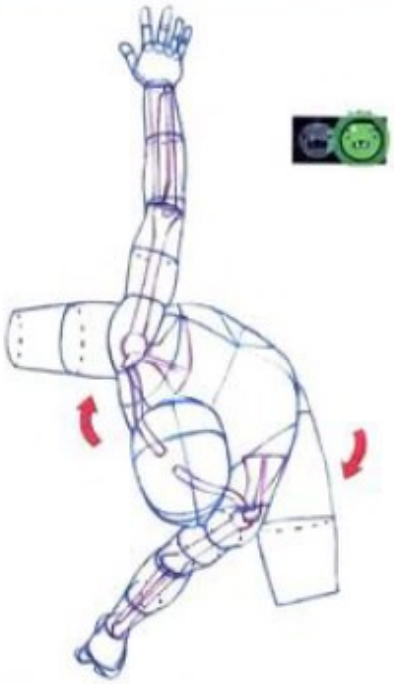
Movement of the clavicle when the arm is moved back and forth

When you move your arm back and forth, your clavicle moves with it. The shoulder moves back and forth in a circular motion around the joint where the clavicle and sternum are connected. When you bring your arms back, the head of your humerus moves inside the box, making your shoulders look narrow when viewed from the front. Conversely, if you extend your arms forward, your clavicle becomes horizontal and your shoulders become wider. The pictures on the left also show information about the maximum range of motion that the arm can move back and forth, so please refer to it!

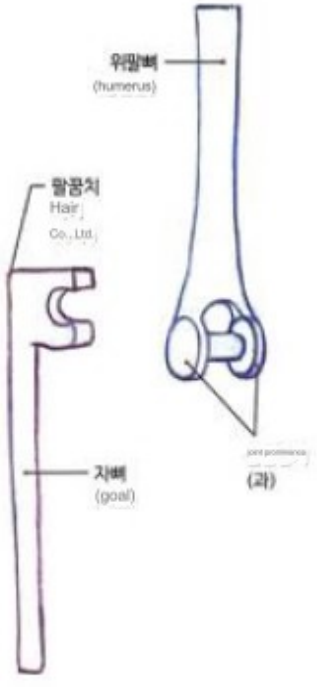
오답노트 movement of the shoulder joint

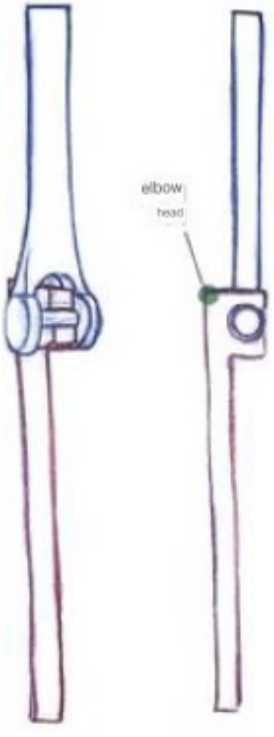
If you move the shoulder joint in a straight line along the side of the box, it will appear dislocated.
The head of the humerus must be located on the acromion joint of the clavicle.

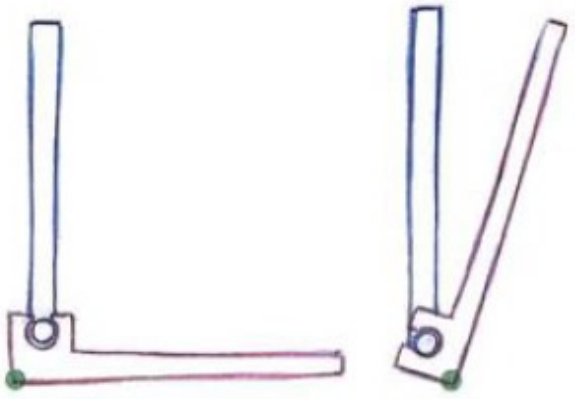




4 The skeleton that drives arm movement







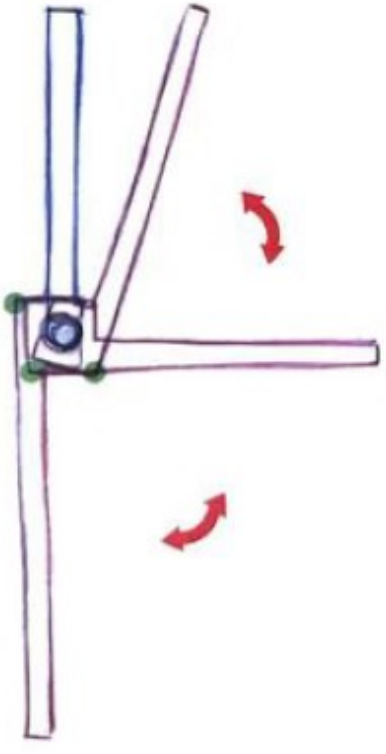
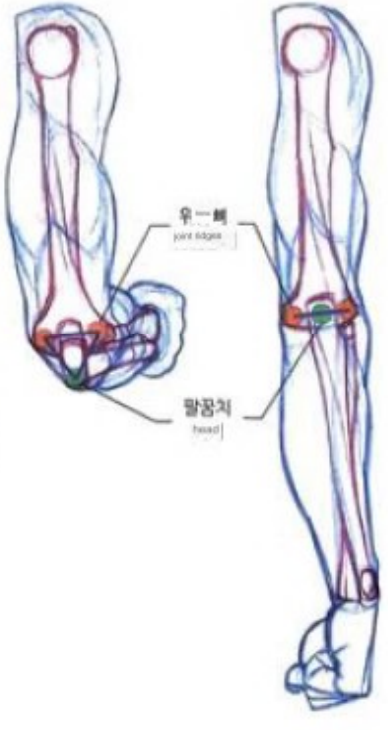


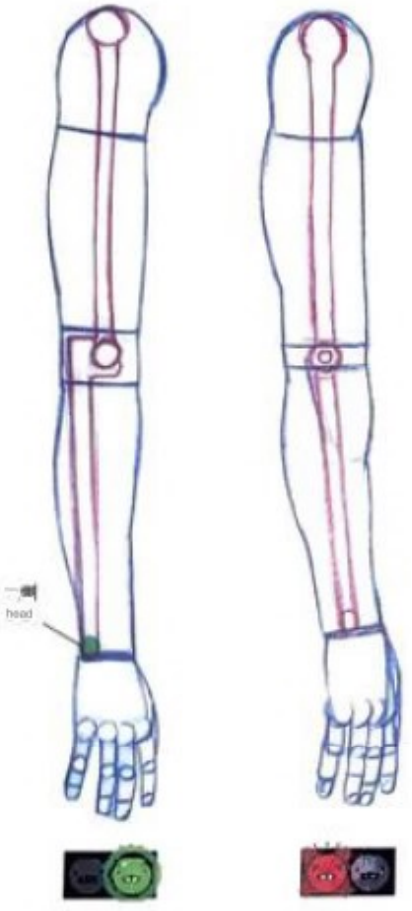
diagram of arm joints

The elbow joint is shaped like a C, with the ulnar bone biting into the upper arm bone. The forearm is made up of two bones, the ulna and the notte, but in the diagram, only the ulna will be represented.



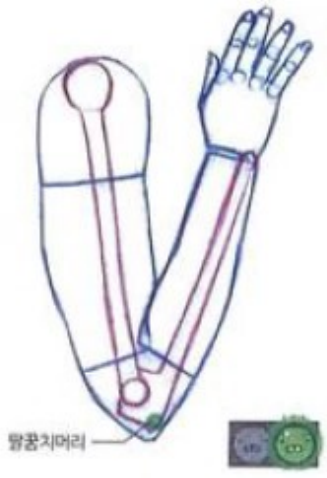
bending exercise of the lower arm

When you move your forearm up and down, the position of the pointed elbow head changes. On the other hand, the articular prominence of the humerus does not move. When you bend your arm, the joint prominence of the elbow head and humerus are in a triangular position, and when you straighten your arm, they are in a straight line.

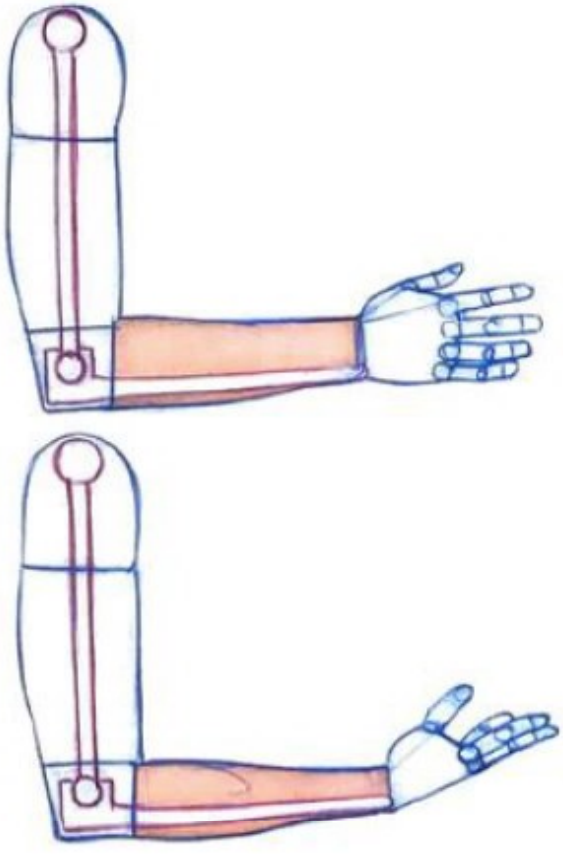


Compare the differences in the shapes of the elbow joints. Additionally,

자세 the head is positioned on the side of the wrist where the little finger is, rather than in the middle.



Every time you move your arm, the position of the elbow head (olecranon) changes, causing a change in appearance. If the elbow joint is drawn in a circle, the change in position of the elbow head is not expressed.



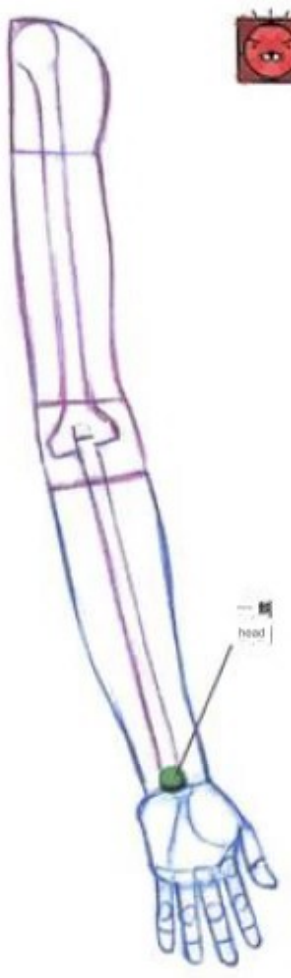
Hand direction and arm silhouette

The silhouette of your arm changes depending on the direction your palm faces. When the lower arm bone rotates, the muscles attached to the bone become twisted or

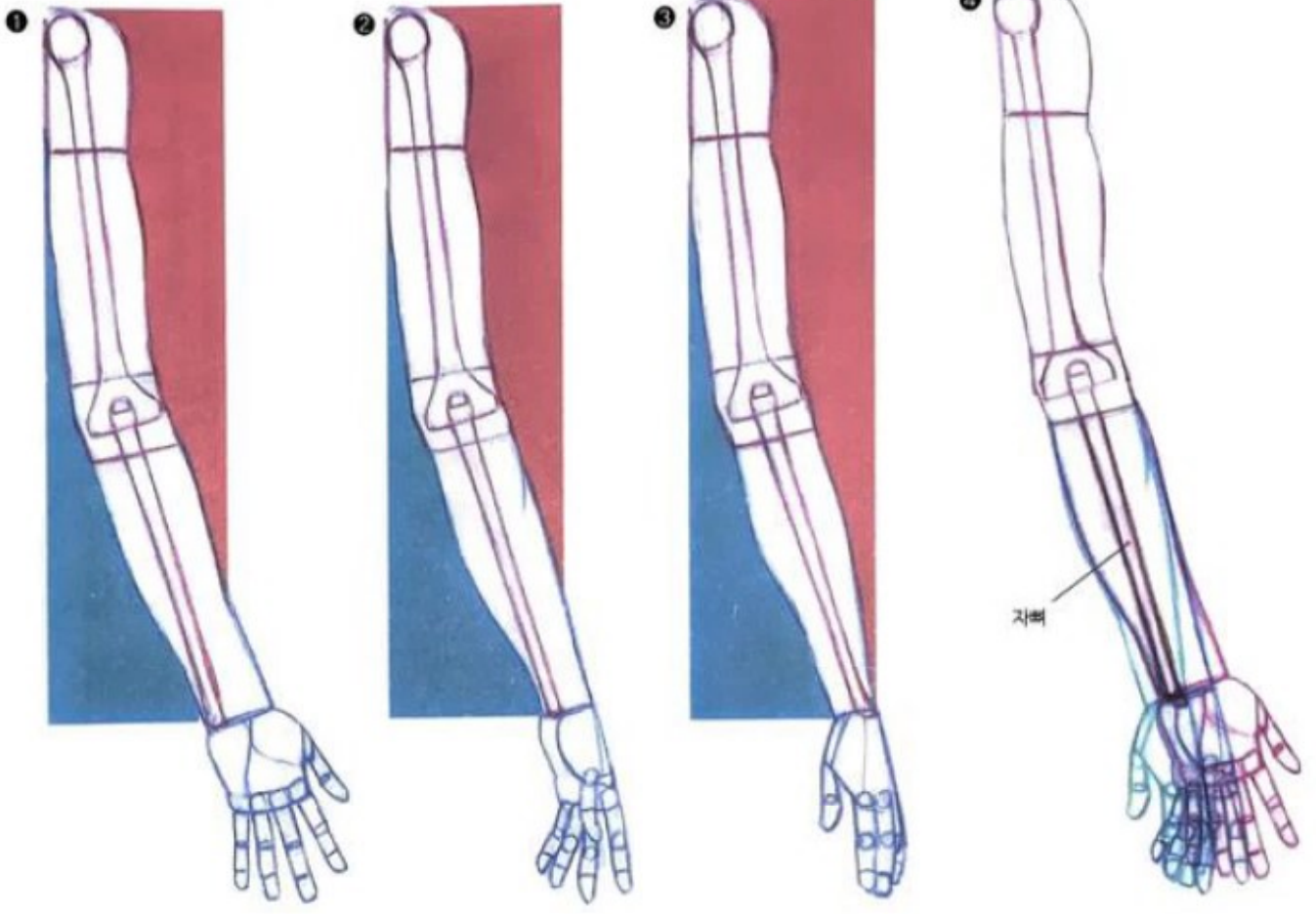
As it loosens, its shape changes.

When drawing an arm, rather than starting from the upper arm and moving down, first determine the position and direction of the hand and then draw the arm flow.

오답노트 _location of the ulnar head

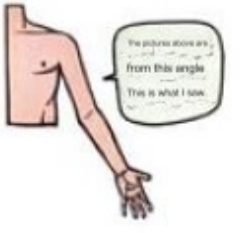


If you place the jeol head in the middle of your wrist, the overall arm angle will be wrong when you rotate your arm.

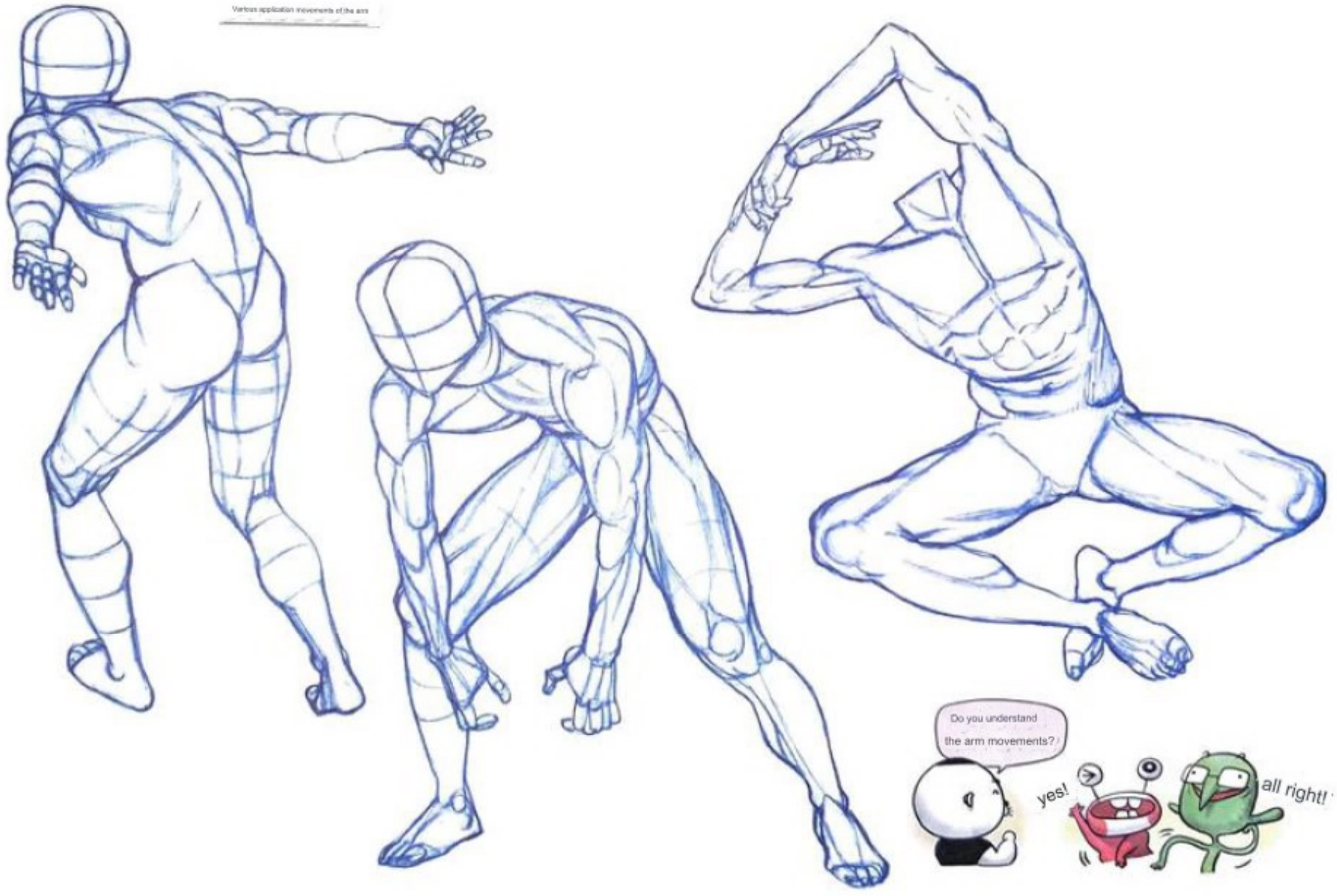


Arm movements: turning

When the palm is facing forward, as in number 1, the angle at which the arm is bent is the greatest. If you place your arm so that the back of your hand is visible like in number 2, you can see that the overall flow looks straighter than in number 2. 2.2. If you look at number 4, which is a combination of number 4, you can observe that when you put your hand down, the ulna does not move, and the hand turns down using the ulna as a reference. The reason why the ulnar bone is used as the standard for the diagrammatic arm skeleton is because the ulnar bone is not affected by hand movements.



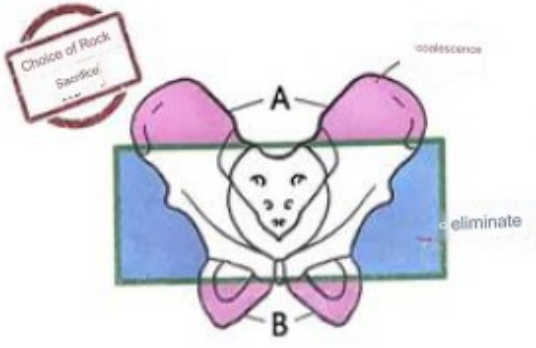
Various application movements of the arm



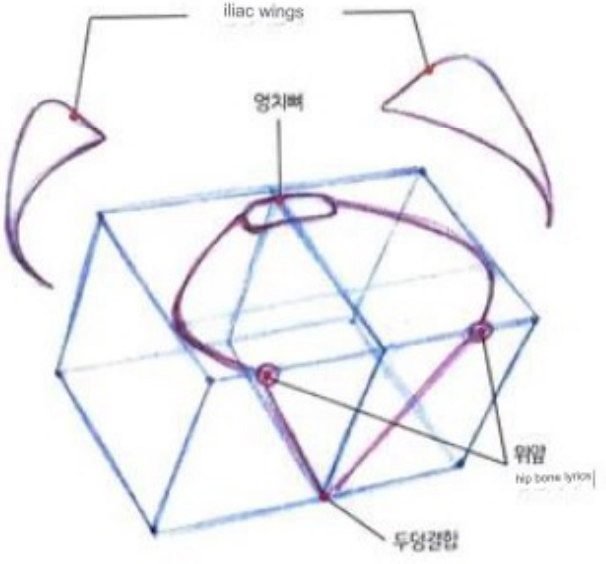
Easily understand the more complex pelvis

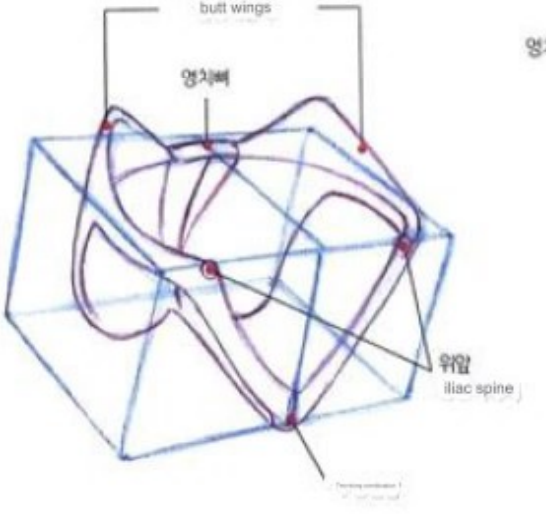
Two ways to shape the pelvis

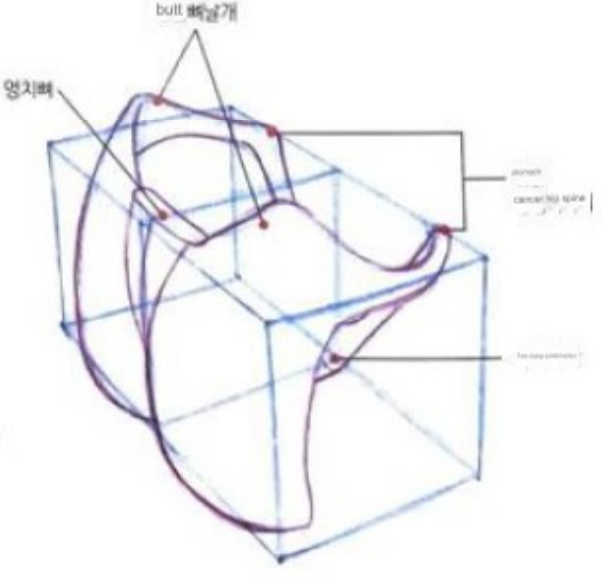
Method 1. Box up the entire pelvis and carve it into detailed shapes.

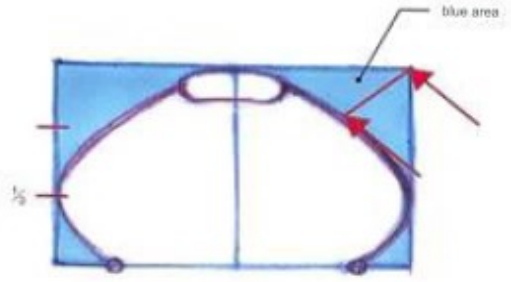


Method 2. After boxing the area with large volume, add parts A and B. (We will learn about B in detail later.)



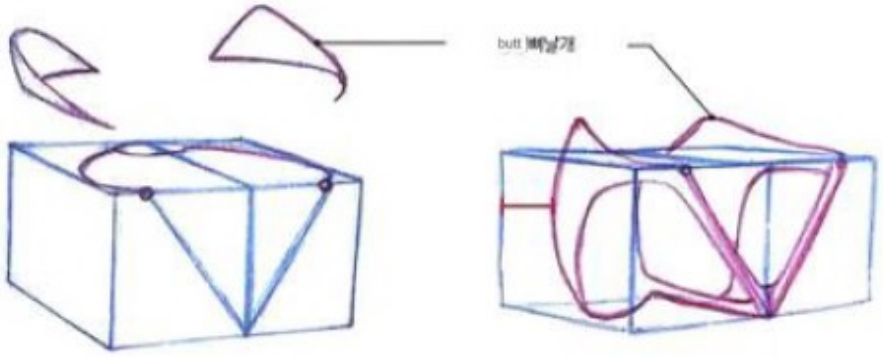






The shape of the pelvis seen through intuition

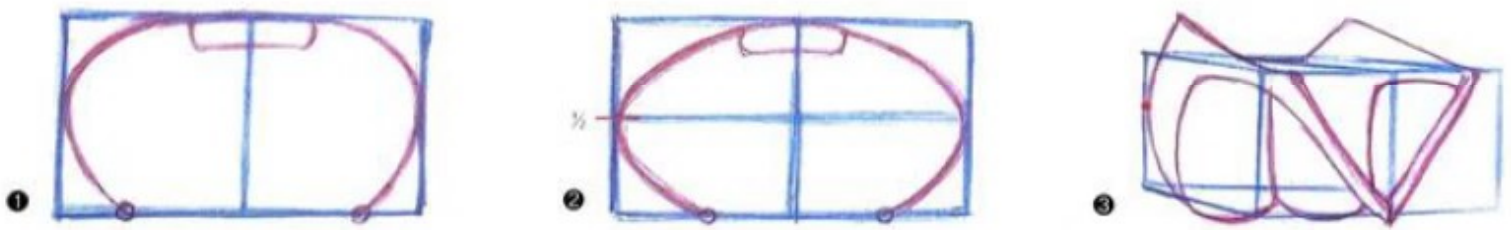
The point where both sides of the pelvis touch the box is the point. The shape of the pelvis is closer to a triangle rather than an oval like the ribs.



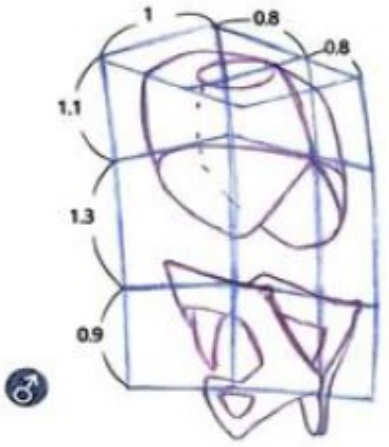
Creating a pelvic diagram

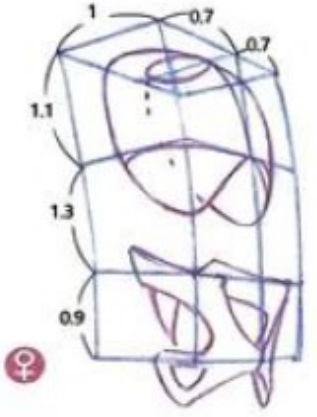
The pelvis looks really complicated. The more difficult the form, the more it must be simplified to understand. Pelvic shaping is a triangular panty line that connects to the buttocks along the flow of the iliac wings. The blue area in the picture on the far left is the space that needs to be cut out, so be careful not to let your pelvis touch the side edge of the box at a half-side angle.

오답노트 Pelvis diagram



As shown in ❶, widen the pelvis to fill the box, or do not place the point that touches the box in a position. Contrary to these precautions, ❷ is an incorrect drawing in which the pelvis touches the side edge of the box. If you draw it like this, of course your butt will get bigger, right?

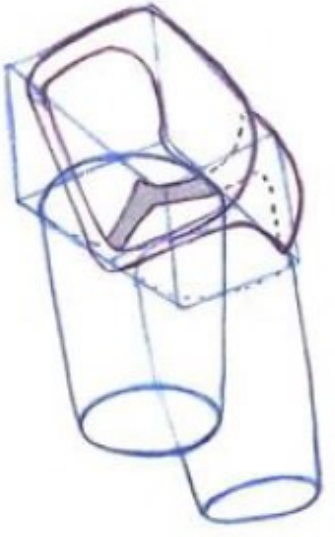


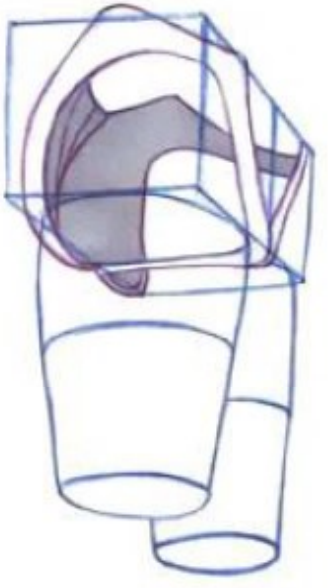


Q&A

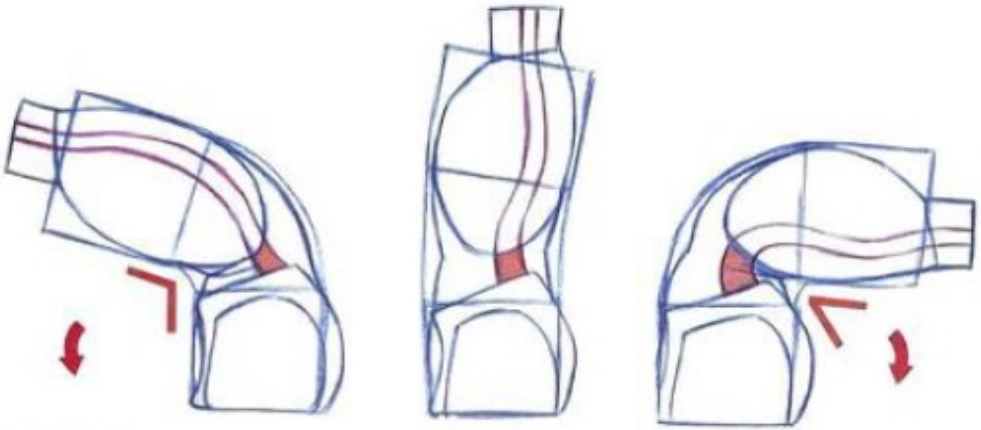
How do I make the body box proportional?

Please refer to the proportions through the boxes on the left. The frontal width of women is slightly shorter than that of men. By repeatedly creating a box by connecting the points you learned when determining human body proportions by looking at pictures of actual models, you can get a sense of the proportions of the torso box.





It is very important to practice holding the pelvic point in the correct position while understanding and drawing even the invisible parts in three dimensions.



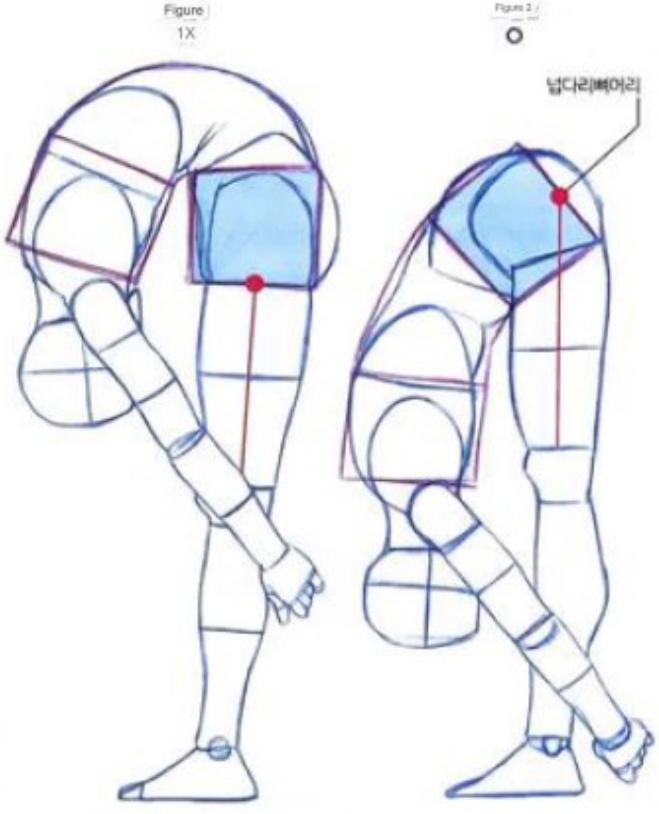
movement of the waist

When you bend your back forward, pressure is applied to your organs, so the angle at which your spine bends forward is not large. On the other hand, the spine is bent back more. The point where the spine bends is the colored part of the lumbar spine in the picture above.

The part of the lower back that can be felt externally is the spinal process, so you should not think of the spine as being in the back. The body of the spine, which is the center of movement, is located deeper in the body than you might think.

오답노트 waist movement

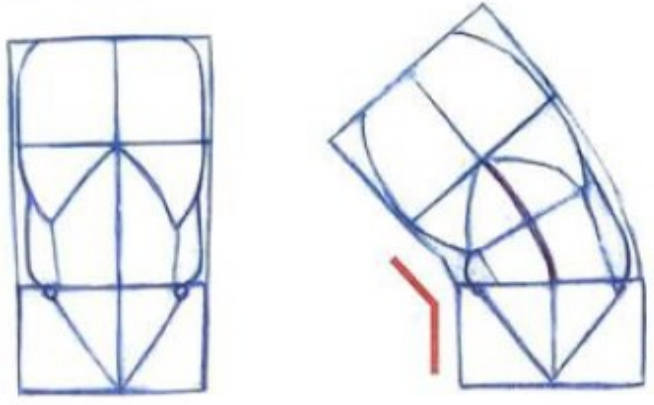
The back doesn't bend this much. If you choose the wrong key point where your spine bends, you will end up with a picture like this that looks like a broken back. Compare it to the answer picture above!



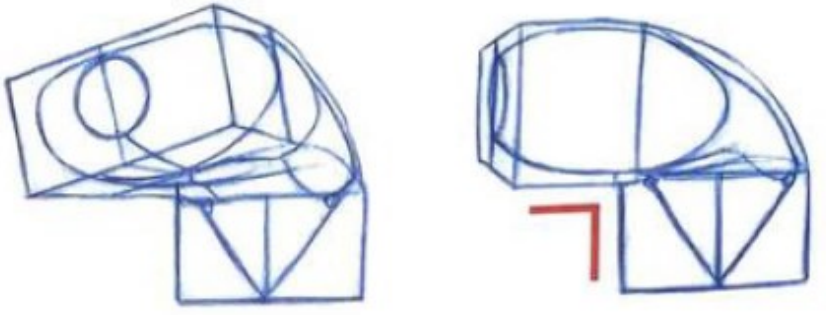
Relationship between the lower back and femur

The reason the body can be folded like a folder is not because the spine is bent as shown in the picture, but because the hip joint, which is the axis of the femur head, moves and the pelvis tilts, as shown in Figure 2.

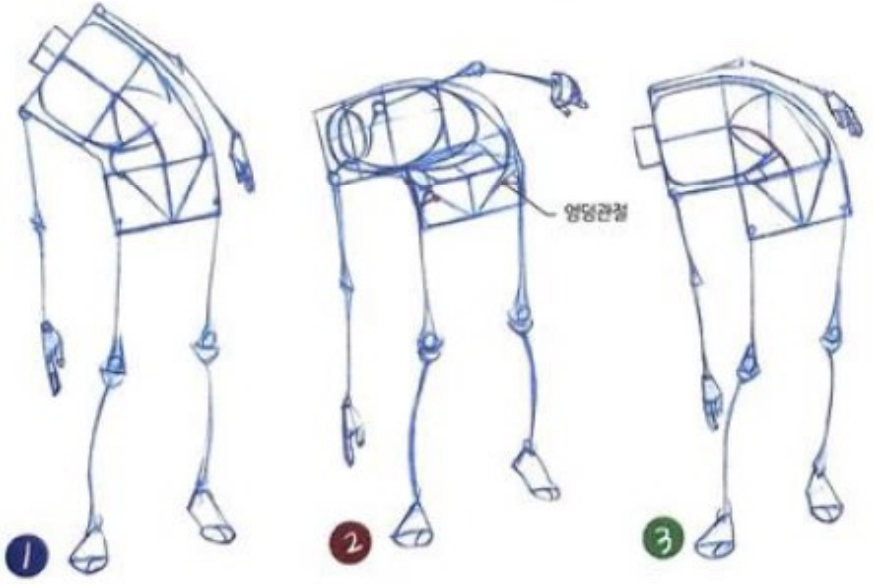
bending posture

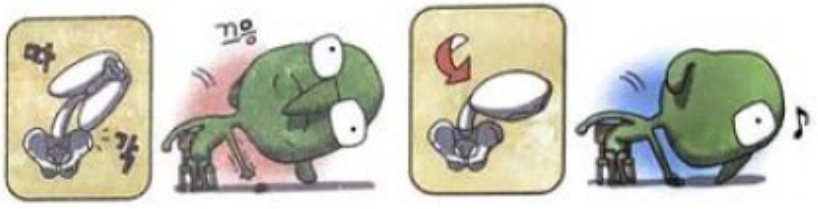


If you bend your back to the side with your upper body facing forward, your lower ribs and pelvic bones interlock with each other, preventing your back from bending too much.



When you twist your upper body, the grooves in your ribs move toward the pelvic bone, creating more space. This results in a posture that allows more bending at the waist.

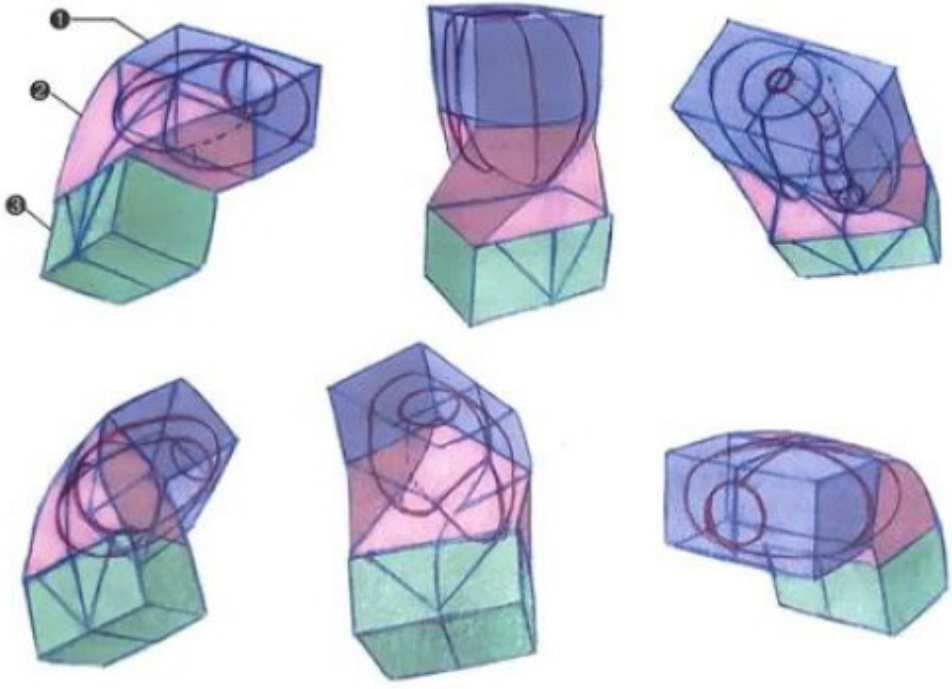




1 When I try to pick up an object that has fallen on the floor sideways, my ribs and pelvis come into contact and my movement is restricted, so I cannot bend my upper body much.

2 As mentioned on the previous page, when you lean forward, the hip joint between the pelvis and thighbone moves more than the lower back, and this movement is the most natural posture when picking up an object that has fallen on the floor.

③ If the motion of the waist bending sideways is expressed excessively as shown in the picture, the ribs will damage the organs, right? In reality, this is an impossible position.



movement of the box

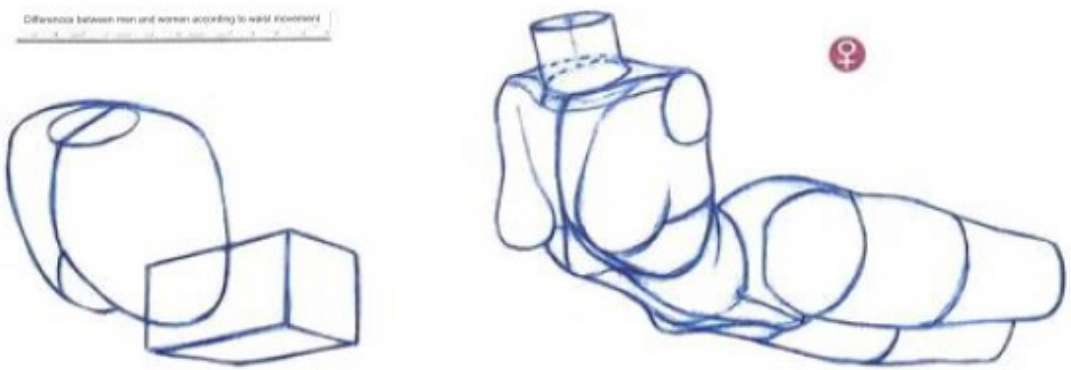
Box 2 may undergo slight deformation depending on movement. Box 2 changes its shape flexibly, bending and twisting. It is drawn curvedly according to the flow of trends.

Box 2 has no change in shape at all.

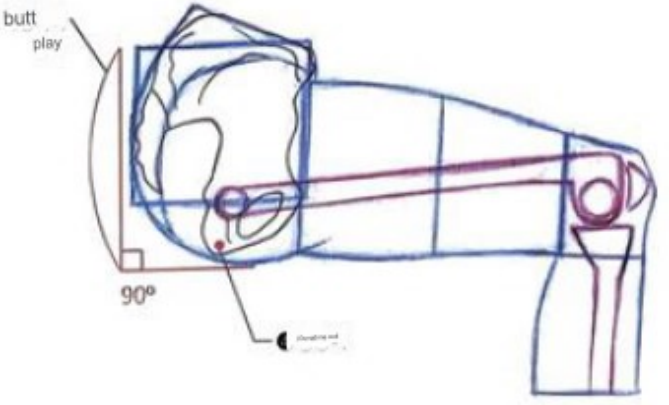
Degree of deformation of the box

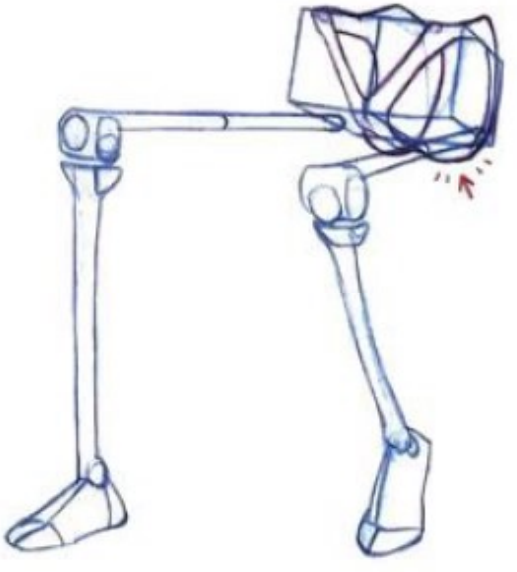
Box 2 (waist) > Box 2 (chest) > Box 2 (pelvis)

Differences between men and women according to waist movement



2 Points of leg movement



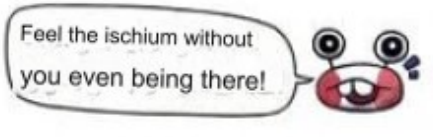


❶ When you move your thighs back and forth, the thighbone moves around the greater protuberance of the thighbone.

❷ The articular eminence of the femur refers to the protruding part behind the knee, and when the knee is bent, the tibia moves along this articular eminence.

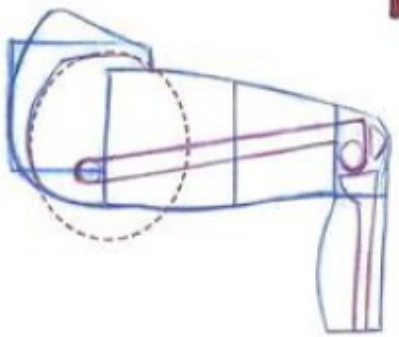
❸ The kneecap moves along the shinbone and has a significant impact on the external appearance of the knee when it moves.

- The ischium serves as an indicator of hip height when the pelvis and femur are at 90 degrees.

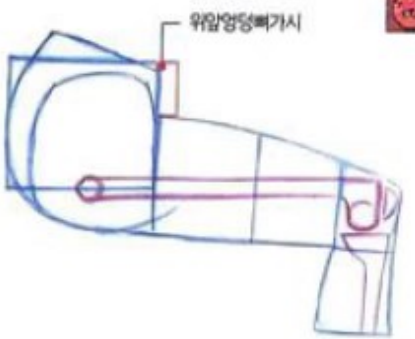


Since the arch bone supports the buttocks in a sitting position, the area where the buttocks are should not be drawn flat.

Additionally, your thighs should come down to the line marking the knee joint area.

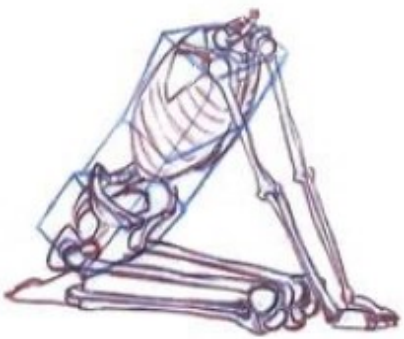


The thigh shape cuts into the pelvic area. The border of the joint area changes position every time it moves. If you use the visible part as the standard for proportion, the shape becomes unnatural when the shape moves. In order to have consistent proportions, shapes must be drawn based on a skeleton whose length does not change.



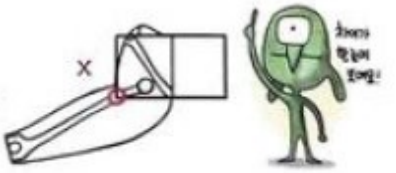
When bending your legs, be careful not to set the distance between the upper anterior iliac spine and the beginning of your thighs too far apart.

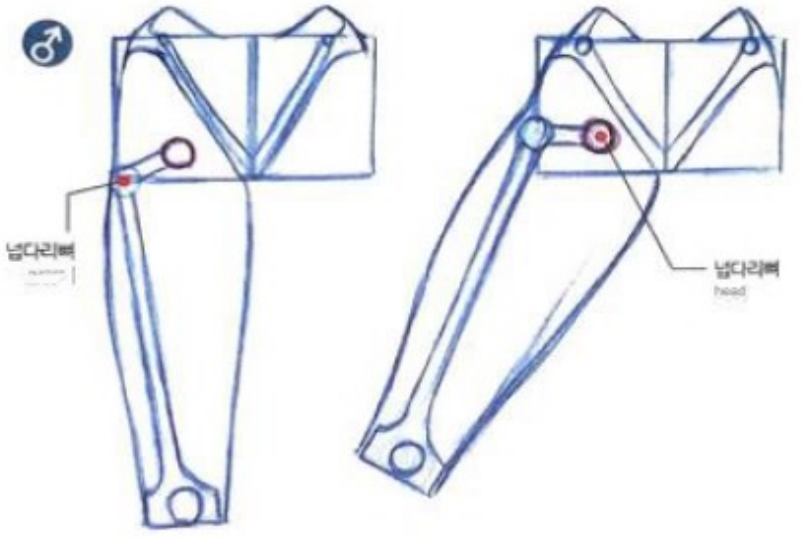
Applied movement with bent legs

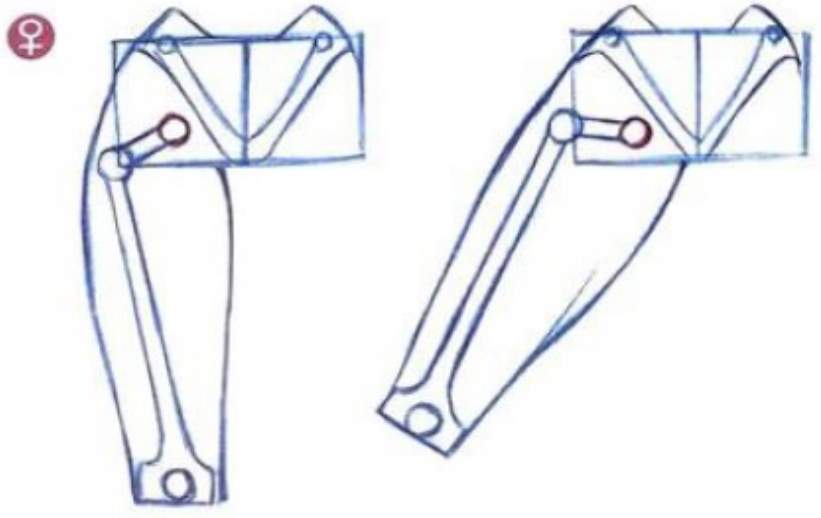


Thigh differences between men and women and movement of the femoral head

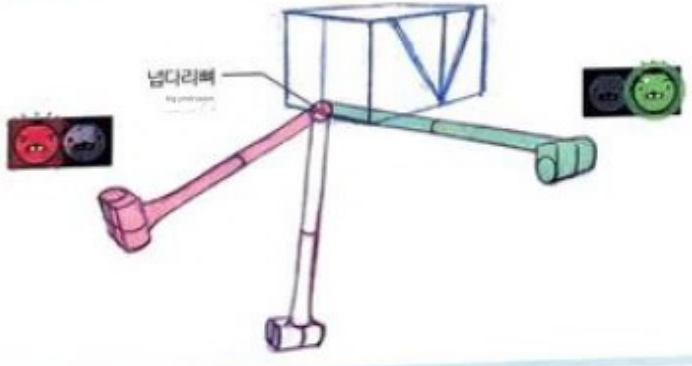
In men, there is not much fat above the greater protuberance of the femur, so the greater protuberance of the femur is in close contact with the skin. In women, fat accumulates around the hips and thighs due to female hormones. So, unlike men, the large protuberance of the femur is covered with a layer of fat and is not noticeable on the outside. When moving the thigh back and forth, the greater protuberance of the femur is used as a reference, but when moving the leg from side to side, as shown in the picture below, the head of the femur is used as the axis.







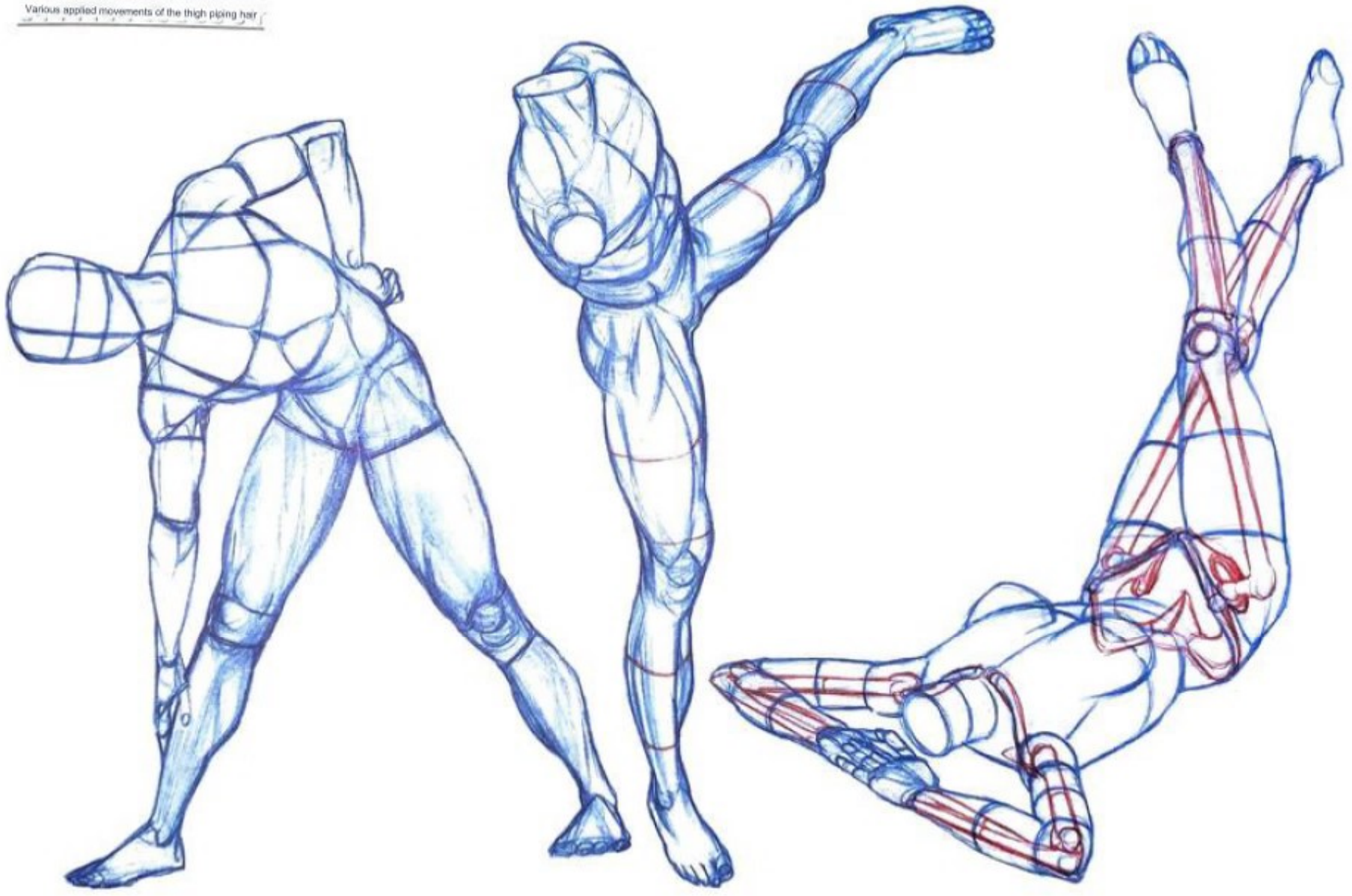
오답노트 Femoral head and greater femoral protuberance

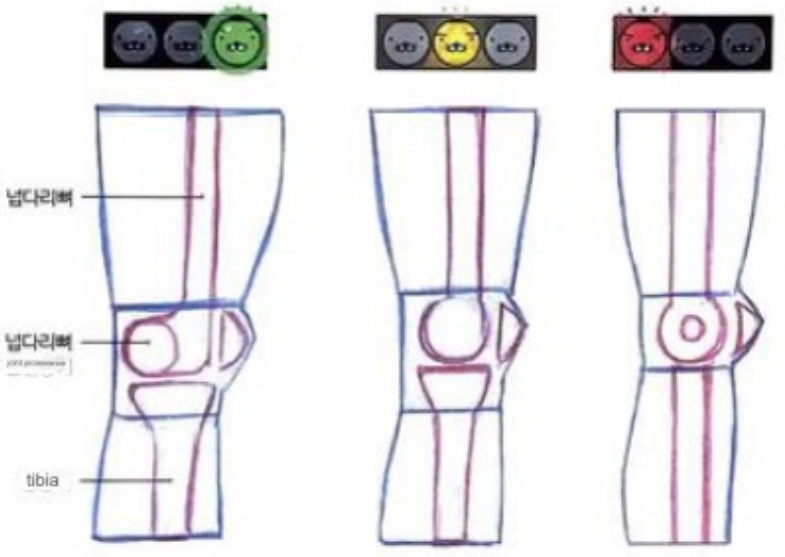


If you do not know exactly the shape of the joint that serves as the axis of movement, the shape of the movement will be wrong. The joint where the femur meets the pelvis is bent in the shape of a golf club. So, you shouldn't think of the humerus as a straight line like we learned earlier. When you move your leg to the side, it is important to be aware of its position because the head of the femur moves around the axis.

When moving the leg back and forth as shown in the green femur on the left, it is not wrong if the large protuberance is the center, but an error occurs when the legs are spread to the sides as shown in the red illustration of the femur. how is it. It's so easy, right?

Various applied movements of the thigh piping hair

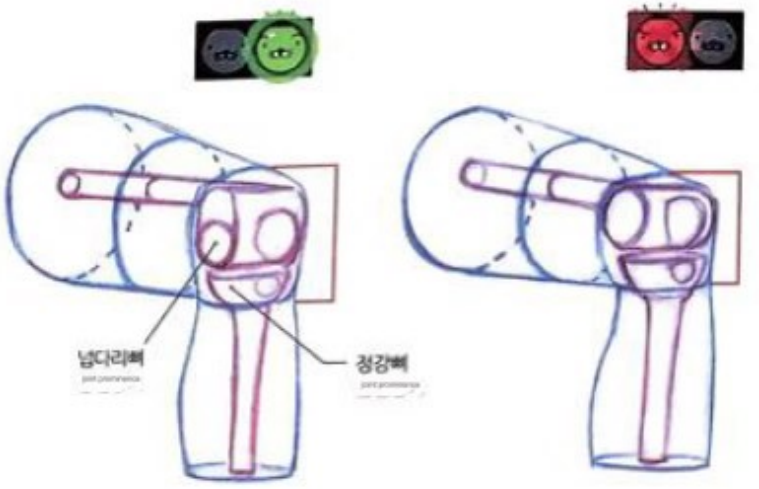




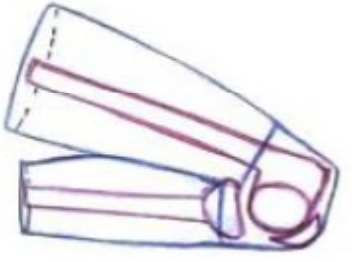
When you look at the knee from the side, the joint is elongated backwards, resembling a golf club. The part where the bone protrudes like this is called the 'articular ridge.'

If the joint prominence of the femur is drawn as a round joint rather than a golf club shape, the knee will appear thin when viewed from the side, giving a poor feeling.

The worst example is to draw the joint ridge of the femur as a circle and the tibia as a straight line, as shown in the picture. This is the most wrong way to draw the knees poorly.



When the leg is bent and the joint prominence of the femur is raised, the height of the knee becomes longer. You should think and draw your knee as a square shape rather than a circle. (Femur joint prominence + tibia joint prominence = thickness increases)

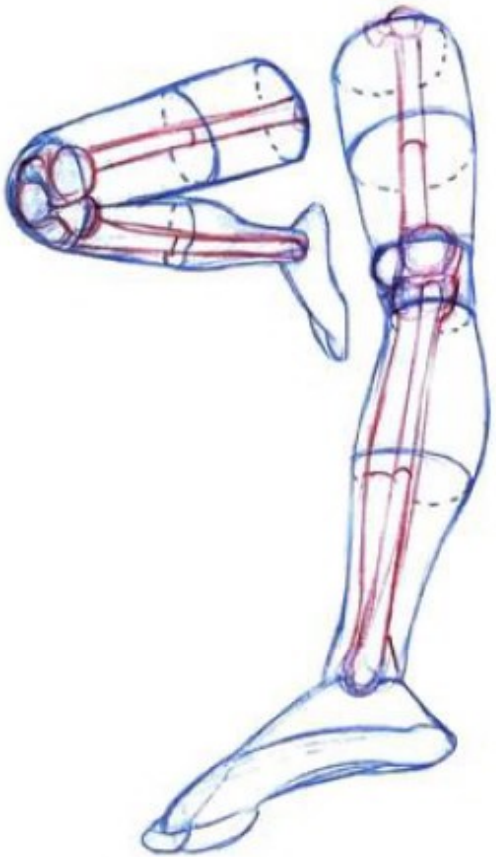


The shape of the knee joint when the knee is fully bent

오답노트 Knee joint shape when folding the leg

The joint prominence of the femur is shaped like a golf club, creating the maximum bending angle in the thigh and calf when the leg is bent.

Applied movements of the legs



8 Center of gravity is really important

Study about center of gravity.
Ana is exhausted.

I'm upset because the character Ana drew keeps losing focus...

Rock sacrifice appeared then!

View the picture objectively

Although I said it as a joke, we actually already have a sense of center of gravity. For example, we can feel the difference in the running postures in the picture on the right. In this way, when looking at a photo or a drawing drawn by someone else, it is easy to tell whether the posture is stable or unstable, and whether it is stationary or in motion. But why do I draw the center of gravity incorrectly when I draw directly? The reason is that when you look at your own drawing, you cannot be as objective as you look at other images. Also, I feel the awkwardness of the center of gravity. There are many cases where we don't know exactly where to fix it.

① Just stop and run

② While running

③ Falling

The proportions, volume, and shape of the body were exactly right, but somehow

If it looks awkward, the culprit is your center of gravity.

However, because this center of gravity changes every time it moves, there is no formalized theory. for example

What should I do if my figure keeps falling backwards when I'm trying to keep it standing?

You should bend your back forward or pull your legs back to balance your balance. The center of gravity must be learned by feel by revising and re-editing the drawing until it no longer looks awkward. First of all, in order to maintain a stable center of gravity, you must step on the floor.

The position of your feet is very important. Let's first look at the width of the foot and the direction of the sole.

Center of gravity and foot position

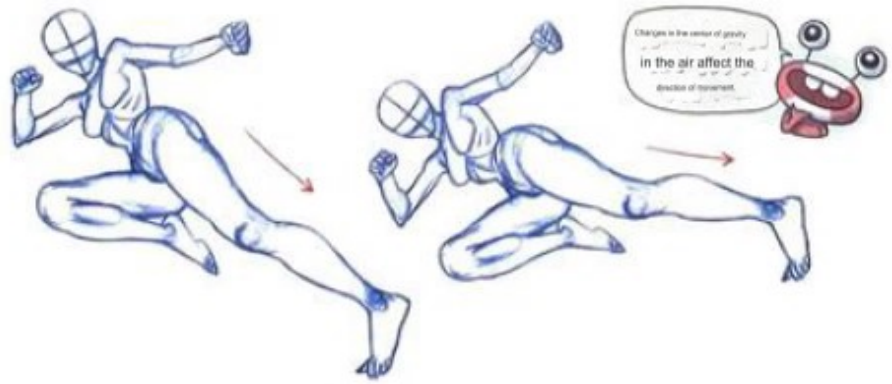
Stride length and position of feet	❶	❷	❸
			
center of gravity	falls easily	Falls when force is applied back and forth	most stable

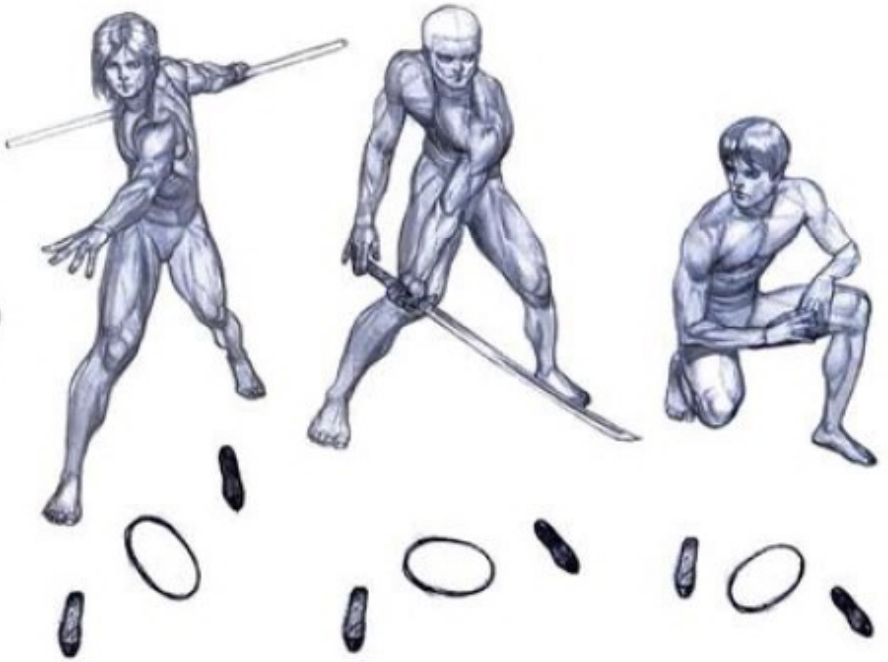
If you stand with your feet planted in an 11-shape position like in number 1, the range that your upper body can move does not go far beyond the light green area. The standing posture is the easiest to fall into and the easiest to make mistakes when doing it. In number 2, the feet are spread out to the sides, allowing the upper body to move left and right, but when force is applied back and forth, the balance collapses. If you place your feet in a diagonal position with the space between the sides and the front and back as shown in number 2, the range of movement of the upper body will be expanded and the probability of drawing the center correctly will be highest.

Let's take a pose ourselves

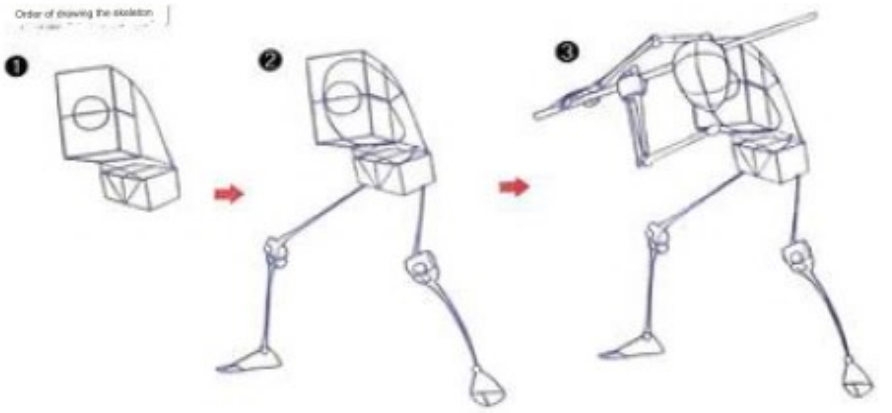
The diagonal stepping posture is often seen in dynamic actions.

You can always create a much more stable posture by posing and feeling the weight on which foot you are putting on before drawing. On the other hand, when the human body is floating in the air, you do not need to think as deeply about the center of gravity as you do when on the ground.

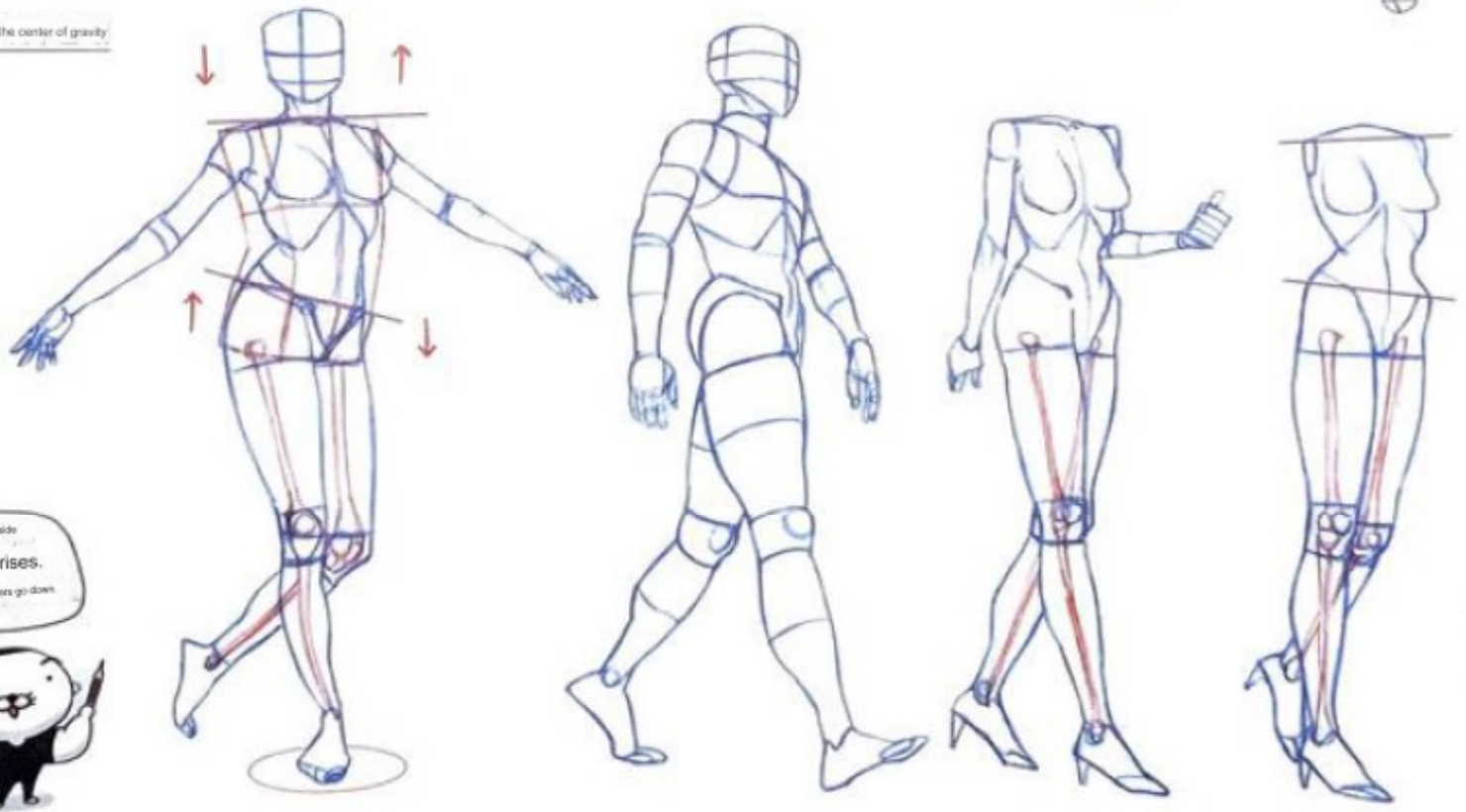




To draw a person with a stable center of gravity, you must first adjust the tilt of the torso, as shown in number 2 on the right. This is because the posture of the lower body changes depending on the flow of the torso, which carries the most weight in the human body. In step 2, you not only select the position of your feet that matches the center of gravity of your torso, but also find the posture of your legs according to the flow you want to express. In step 2, draw arm movements that match the flow of the torso and legs drawn earlier in a line that does not affect the center of gravity. The object you are holding in your hand also affects your center of gravity, so this is also an important factor that cannot be left out in the calculation.



Tips for adjusting the center of gravity



When you take a step, your weight is placed on the foot, and as a result, the shoulder line and pelvic tilt shift to align the body's center of gravity.

Figure 1

of gravity

중심점
중심점

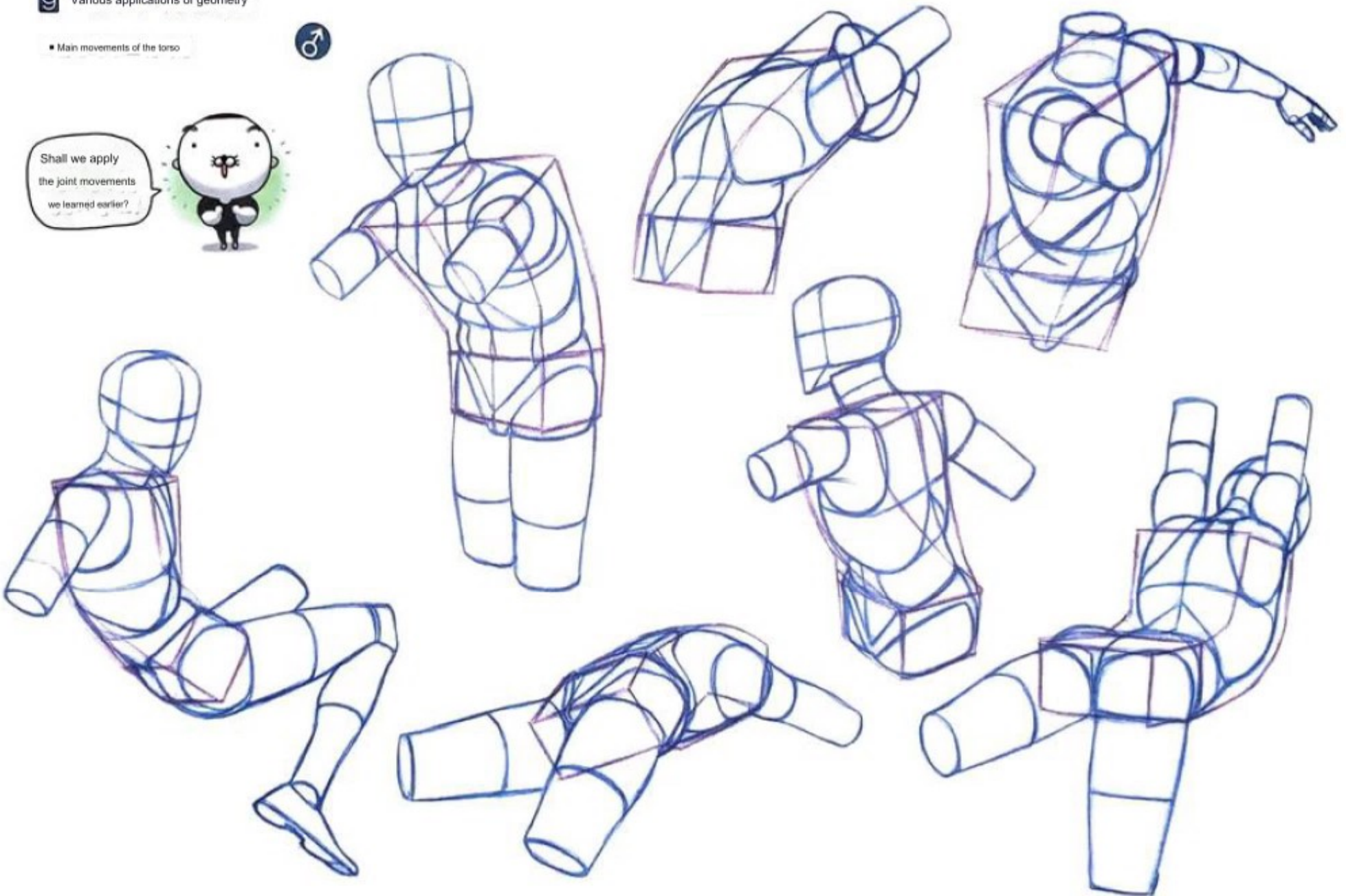
Figure 2

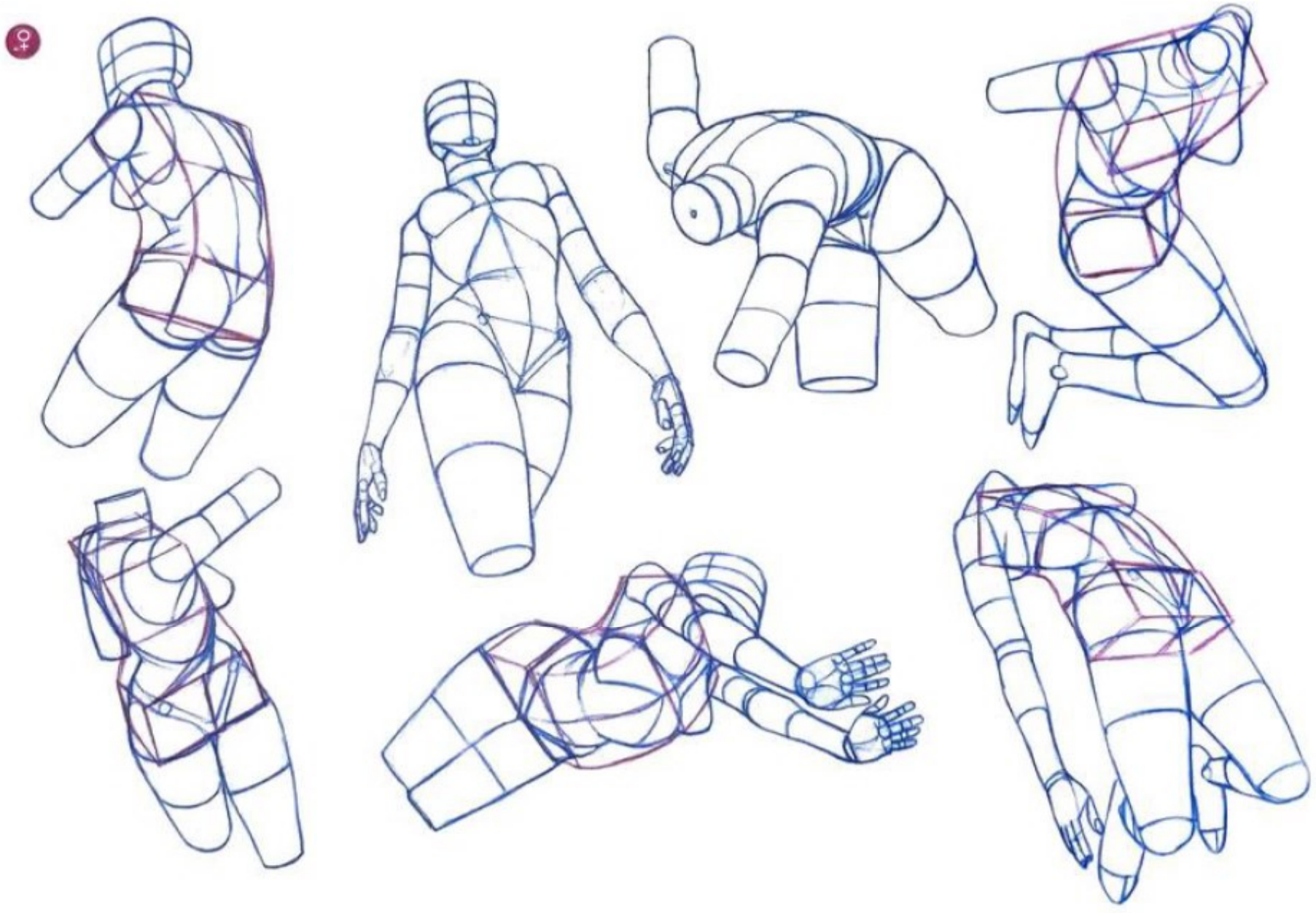
Figure 3

Finding the center of gravity according to posture

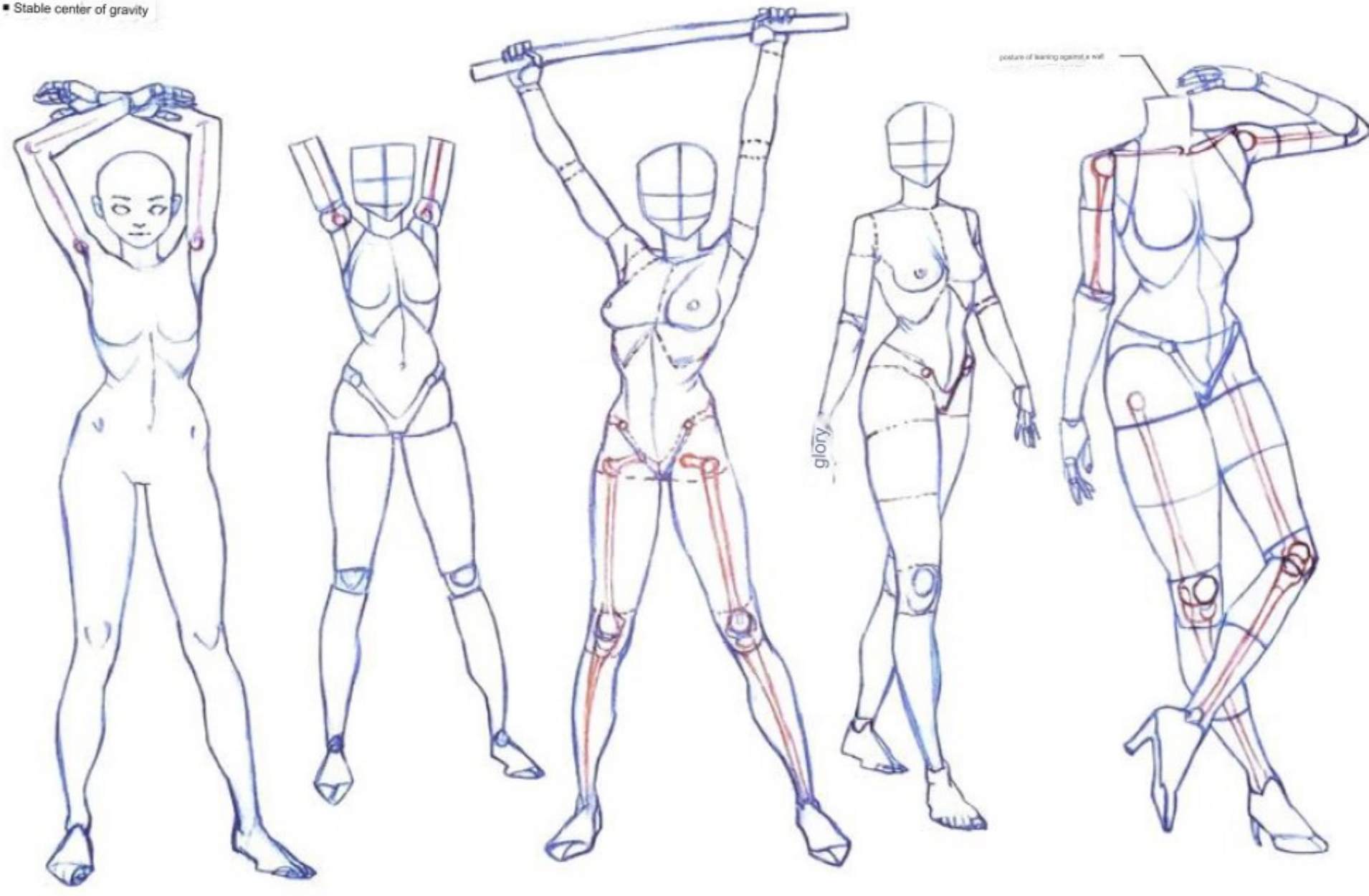
When determining the center of gravity, look at your posture from a side angle and divide it vertically into two so that the left and right sides have the same weight. The point where the center of gravity meets the floor is called the 'center point'. In order for the center of gravity to be correct, the center point must touch the foot directly as shown in Figure 2.3, or if it does not touch the foot as shown in the picture, the center point must fall on the line drawn between the feet. There are several ways to adjust the center of gravity. Please note that this method is one of them.

- Main movements of the torso





■ Stable center of gravity

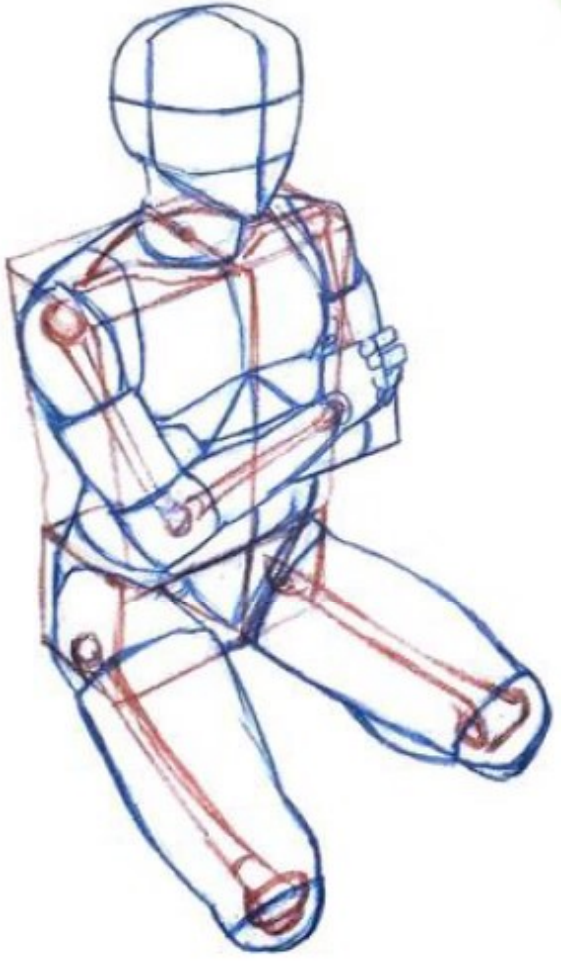


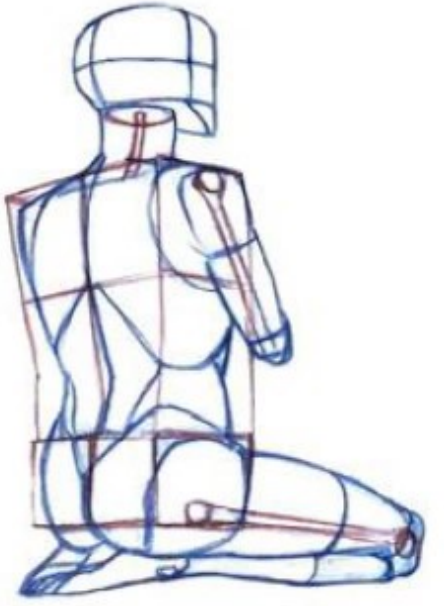
When drawing, draw in order from the largest volume to the smallest volume. Rather than drawing a large picture based on a small part, breaking it into smaller parts based on a large part increases the chance of drawing it in accurate proportions.

When drawing the human body, it is easier to determine the proportions and movement if you draw the bulky body first.

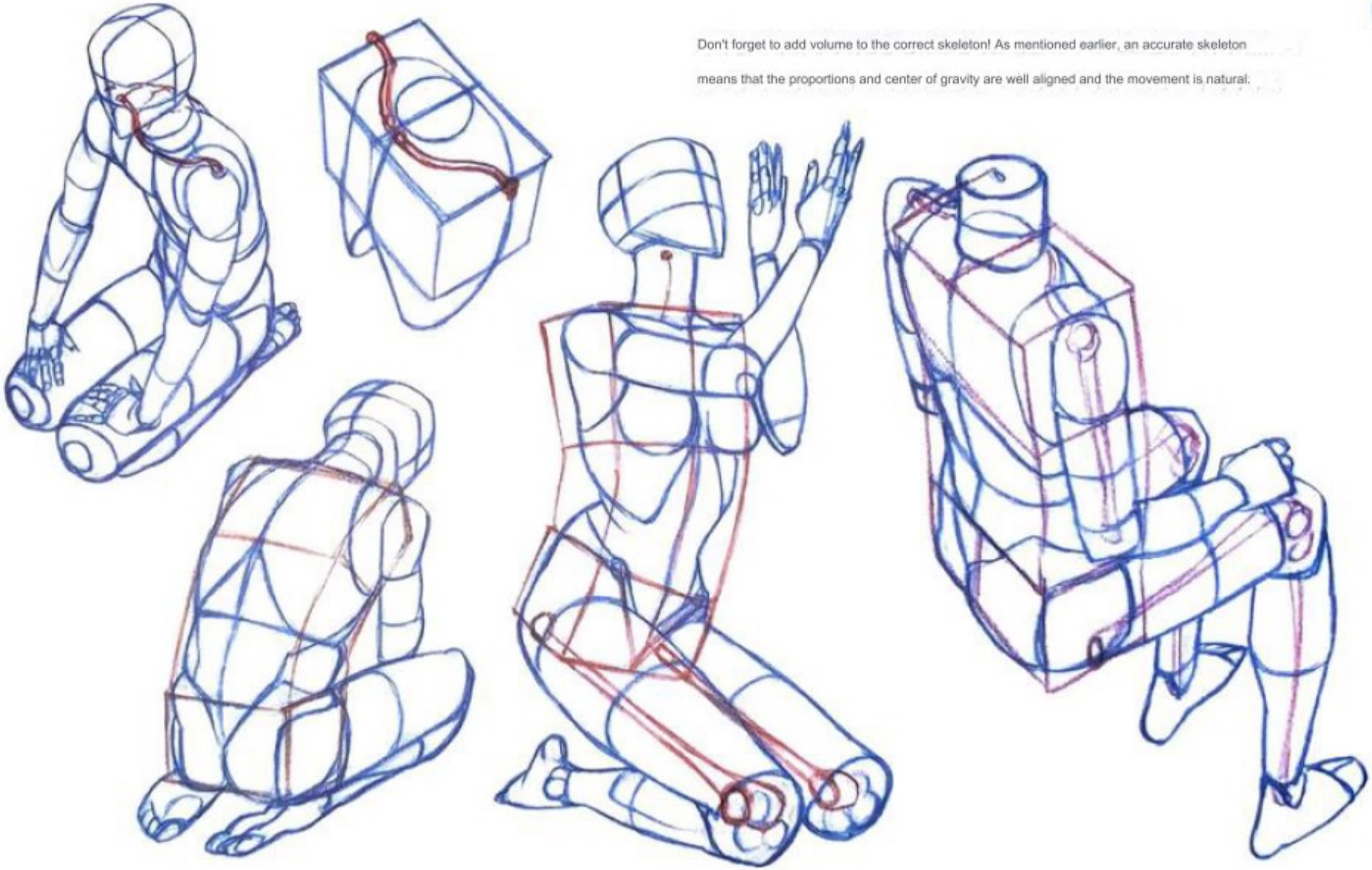
■ Sitting in a variety of ways

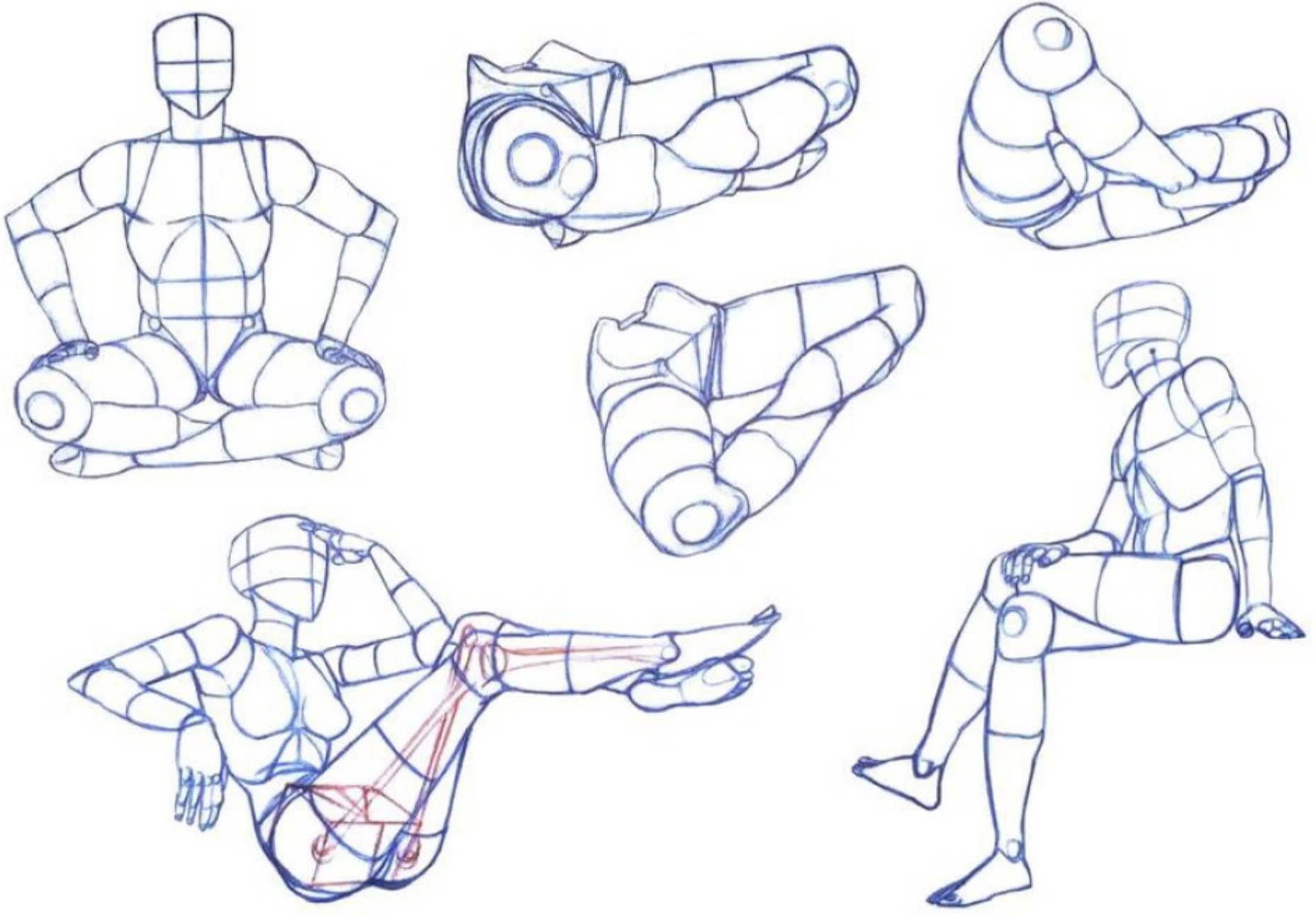
Drawing one posture from various angles helps you understand the flow and volume of the body three-dimensionally. Study the movement of your joints by changing your posture little by little.

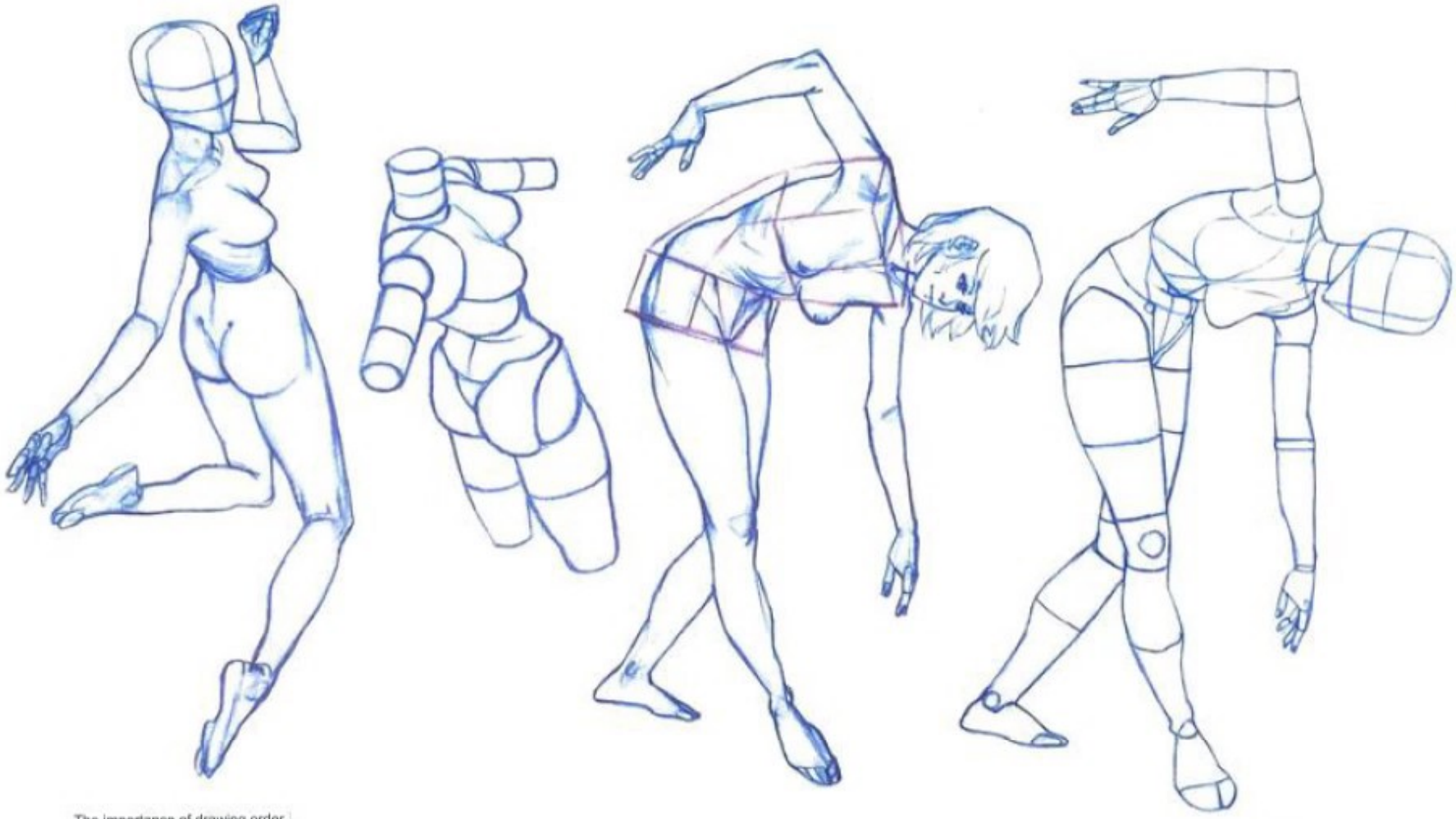




Don't forget to add volume to the correct skeleton! As mentioned earlier, an accurate skeleton means that the proportions and center of gravity are well aligned and the movement is natural.







The importance of drawing order

To draw a picture with solid fundamentals, you need to combine theory and practice. If you focus too much on theory, the characters will be portrayed in an unflattering way. Conversely, if you only practice practical skills without theoretical knowledge, your application skills may decrease and it may be difficult to draw various poses or compositions. When practicing, it is important not to try to complete the drawing in one go like professional artists do, but to draw it one by one from the skeleton to the diagram. Professional writers work by mentally calculating the framework and diagramming process through a lot of practice, rather than skipping it.

■ From graphic to human body

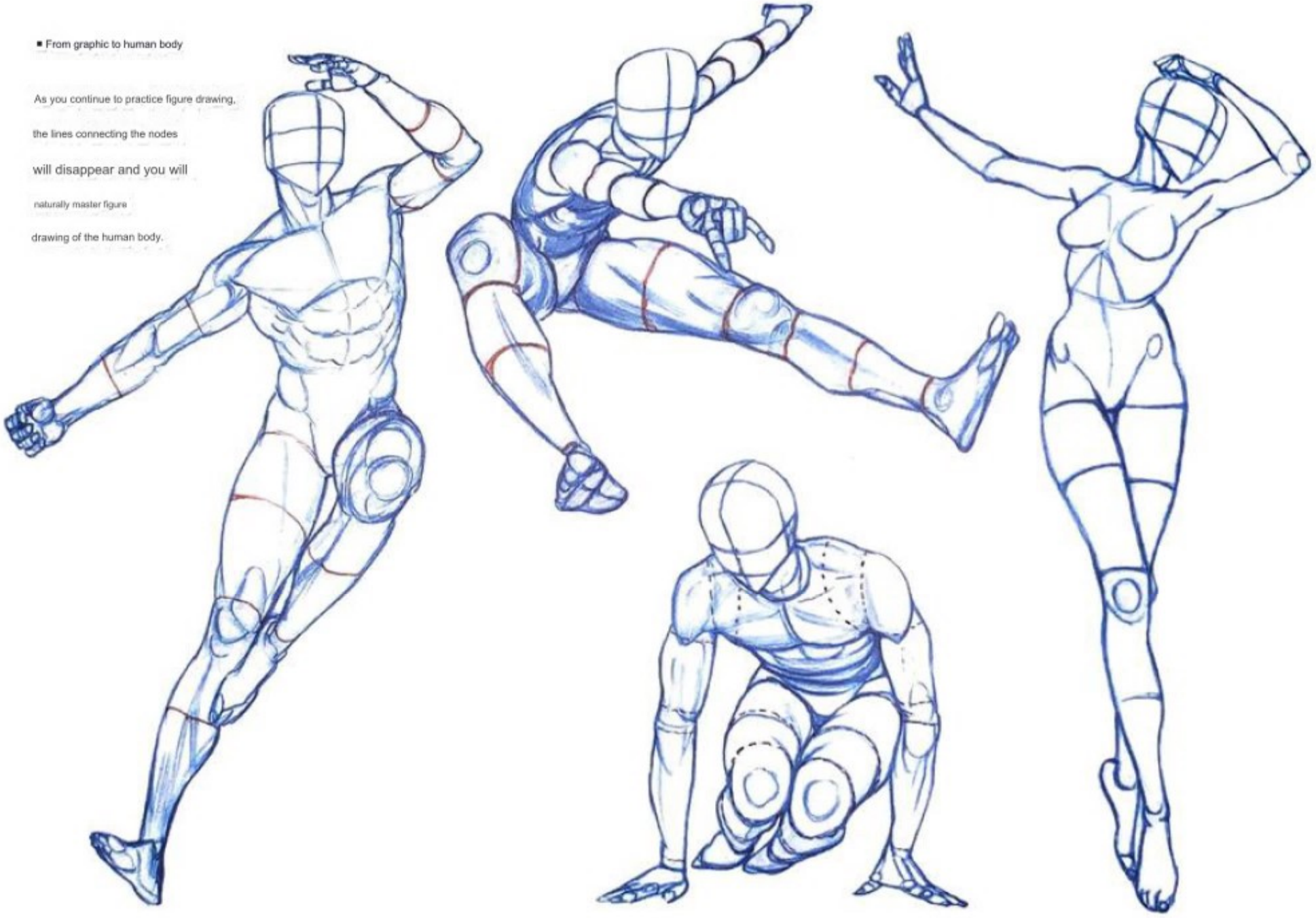
As you continue to practice figure drawing,

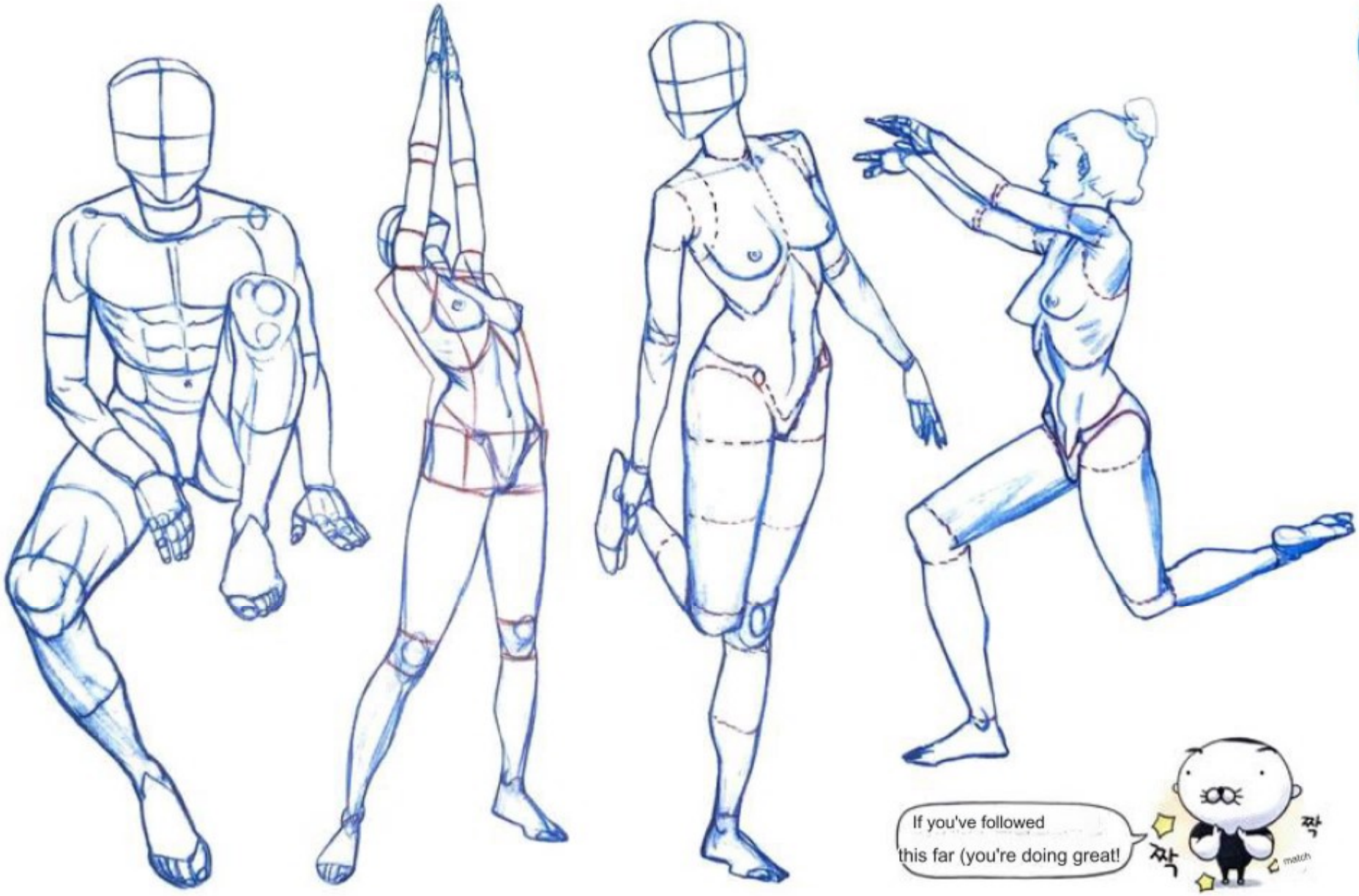
the lines connecting the nodes

will disappear and you will

naturally master figure

drawing of the human body.




If you've followed
this far (you're doing great!
짝
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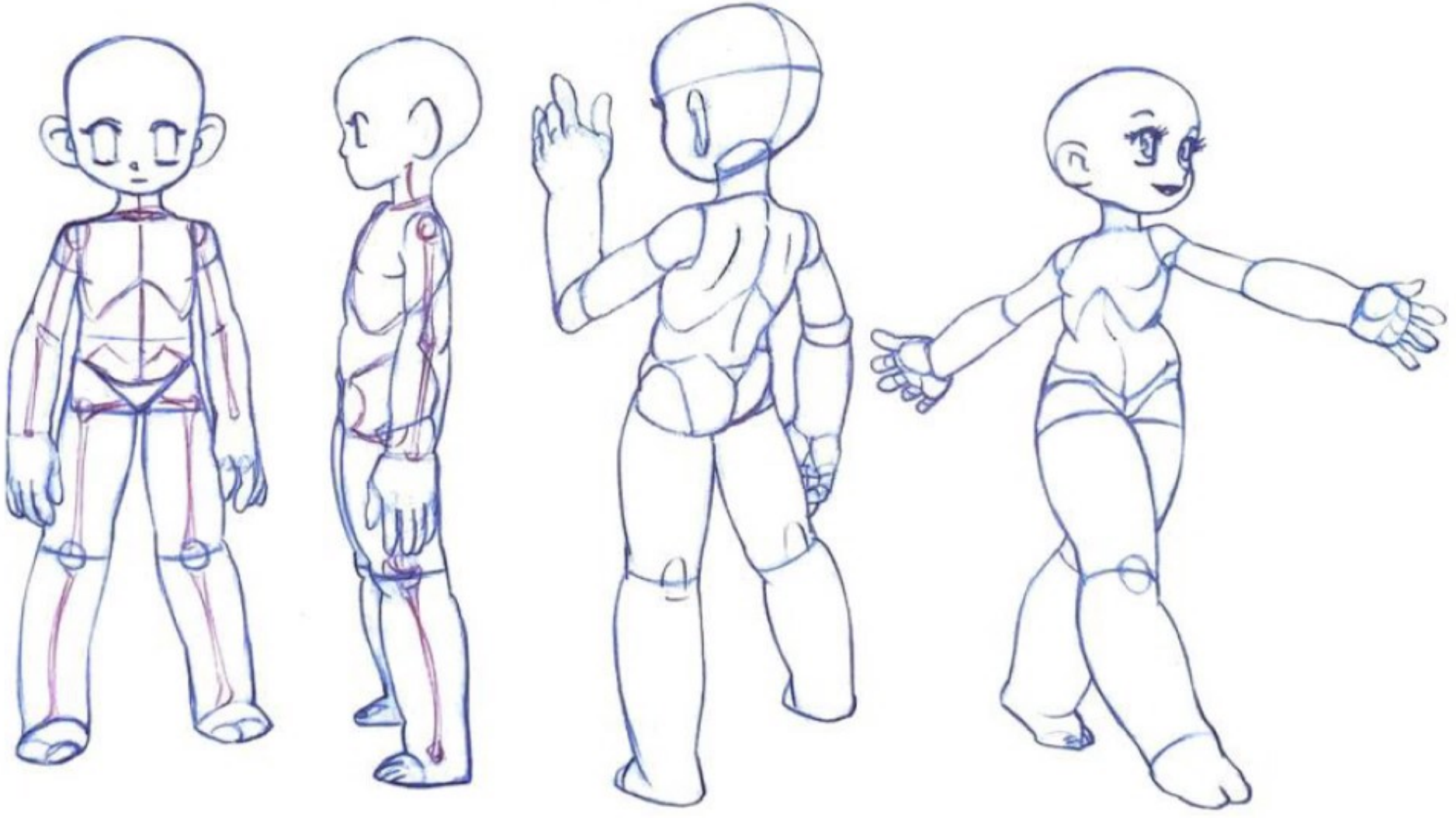
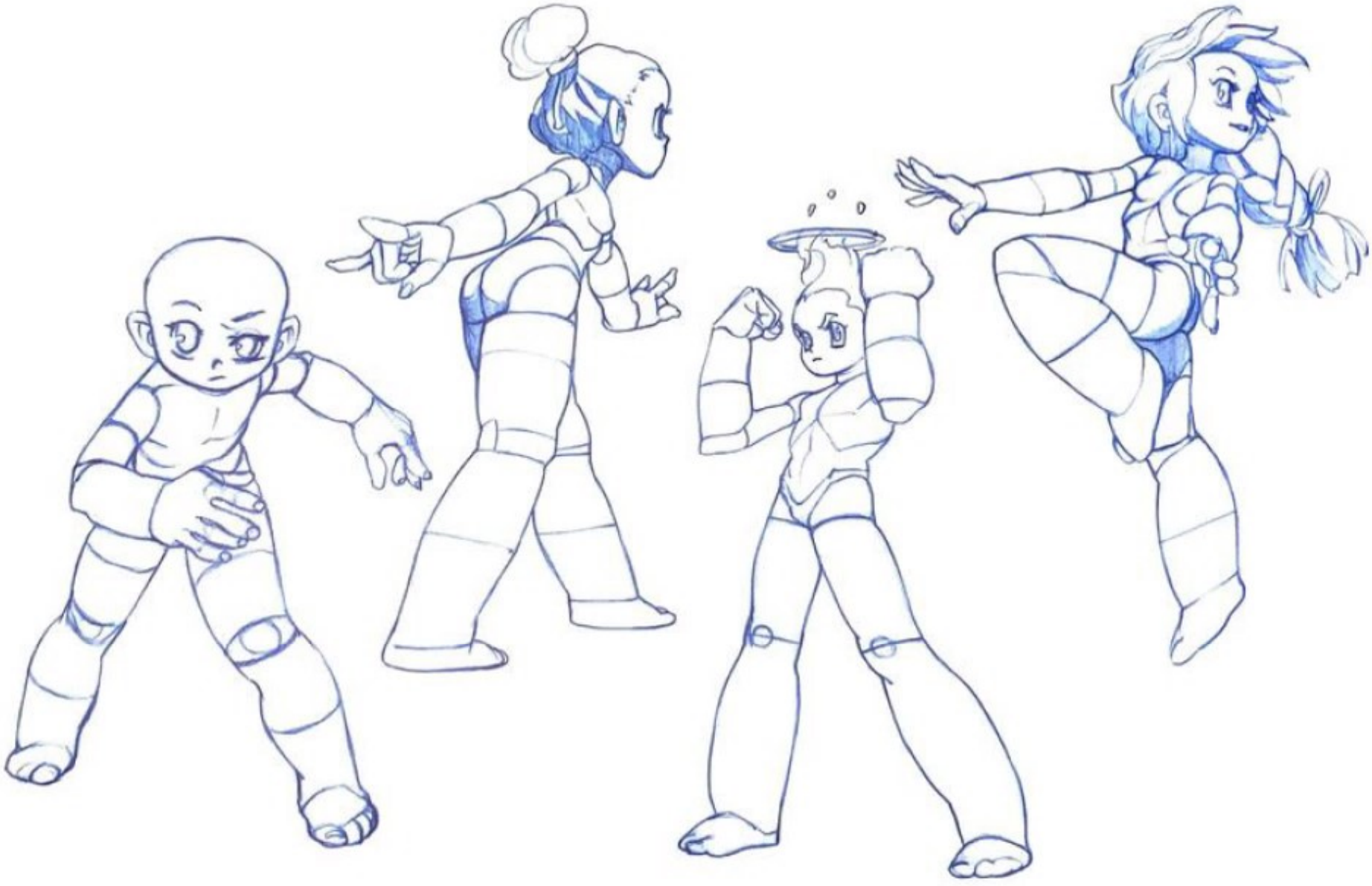
match

■ Understanding characters deformed through graphic drawing

Geometry can be applied not only to the realistic proportions of polarized fonts, but also to various pictorial styles.

When designing a deformed SD character or creature, you can more easily draw a three-dimensional shape if geometry is the basis. If the proportions or appearance change every time you draw a character, or if it is difficult to change the character's posture and angle, practice drawing to improve your structural understanding!





face recognition

Why is it important to draw faces? Humans, who have lived in social solidarity for a long time, have developed skills to communicate with each other. For communication, complex interactions using faces were important. To be able to identify who is who, I had to be able to recognize differences in appearance and read subtle facial expressions that convey the other person's emotions and intentions. Community life has made us more sensitive to information about faces. Scientifically, when the human brain looks at an object, only the area responsible for vision is activated, but when looking at a human face, most of the sense organs, including sight, smell, hearing, and touch, are activated simultaneously. When we look at faces in pictures, our brains react just as sensitively as when we look at real faces. In this way, the sense of recognizing a face is immediate and delicate, so drawing a face requires high precision.

The face is also one of the most interesting parts of the human body. This is because it is a powerful means of expression that can give an impression to a character and directly express emotions. This is also the area where students practice the most. The main concern they have when drawing faces is that they always draw only limited angles. Just as good selfies all have similar angles. Structural research on the face is necessary to express attractive appearances and persuasive facial expressions from various angles. In this chapter, we will cover how to understand the face three-dimensionally by shaping it so that the shape and proportions do not collapse even from various angles.

We will also anatomically study how light and dark are created on the face through the structure of the facial bones and what muscles are used when making facial expressions.

Drawing faces
is really hard!

Ana, who has been covering up the parts she can't draw due to her lack of drawing skills.

Thanks to my hard drawing practice,
I went on an outing with the character.

Oh my, the character wants to ride a Viking.

Ana is embarrassed.

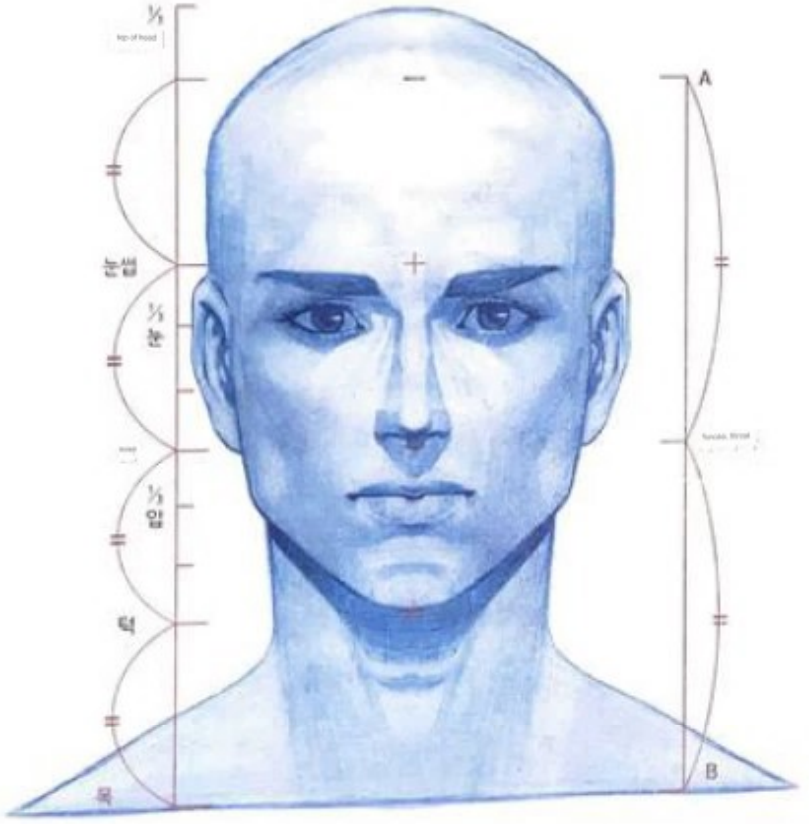
The character learns why he was only
at eye level for so long.

Ana decided to take on the challenge to
expand her character's scope of activity.

This confirms once again that it
is difficult to draw faces with angles.

Then, let's learn how to
draw faces with Rock Hui-saeng!

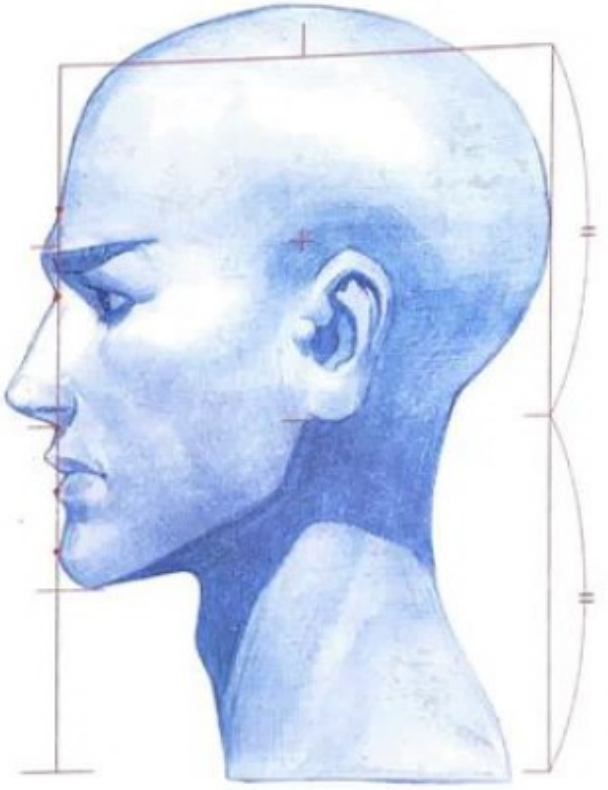
■ Male facial features and division



Proportions of the male frontal face

There is no correct answer to facial proportions because each artist has different preferred facial proportions. I adjust the proportions of the face by placing each point in the same equal position as shown in the picture above. Dividing the length from A to B in half is the location of the nose and neck. The length from the tip of the chin to the clavicle is the point of the neck.

The width of the head at the front is narrower than the width at the sides.



Baseline of the side line of the face

•Parts that protrude outside the line: eyebrow arch, nose, upper lip

•Parts that touch the line: forehead starting point above the eyebrow arch, nose root point, Subnasal point, lower lip, protruding forward from the chin

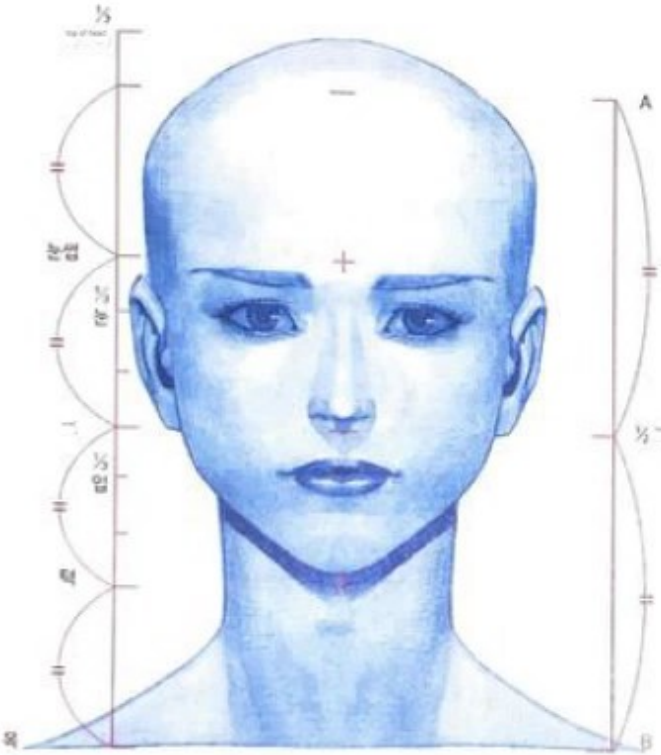
•Denched areas inside the line: forehead, lip gap, Sublipomandibular sulcus, the downward curved side of the chin

How to measure the width of your facial features

One eye fits between the eyes. The width of the nose is the same as the width of the eyes.

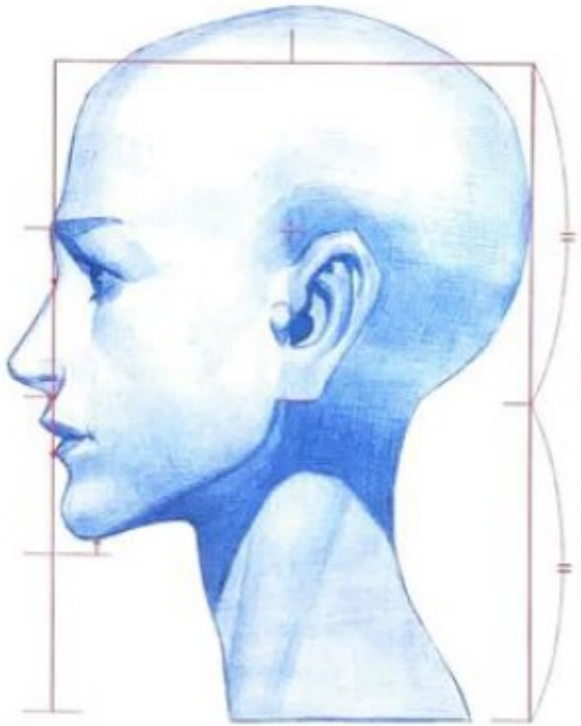
If you lower the point where the pupils of both eyes start vertically, it will reach the corner of the mouth.

The width from the point where the eye ends to the outer line of the face is the length of the eye.



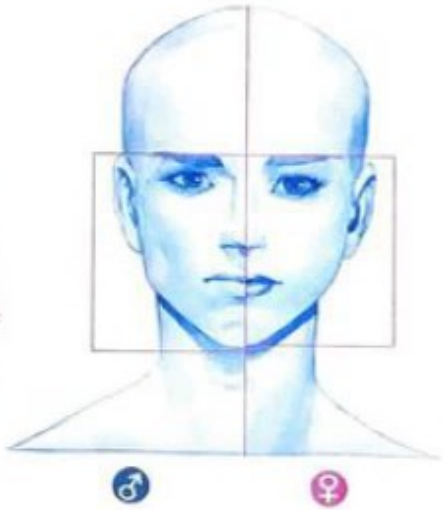
Proportions of the female frontal face

Women have wider upper eyes and shorter chins, giving them a youthful appearance. Women have slimmer chins than men due to the influence of hormones. The size of the ears is equal to the distance from the eyebrows to the nose, and the eyebrows are drawn longer than the length of the eyes.



Facial features seen from the side

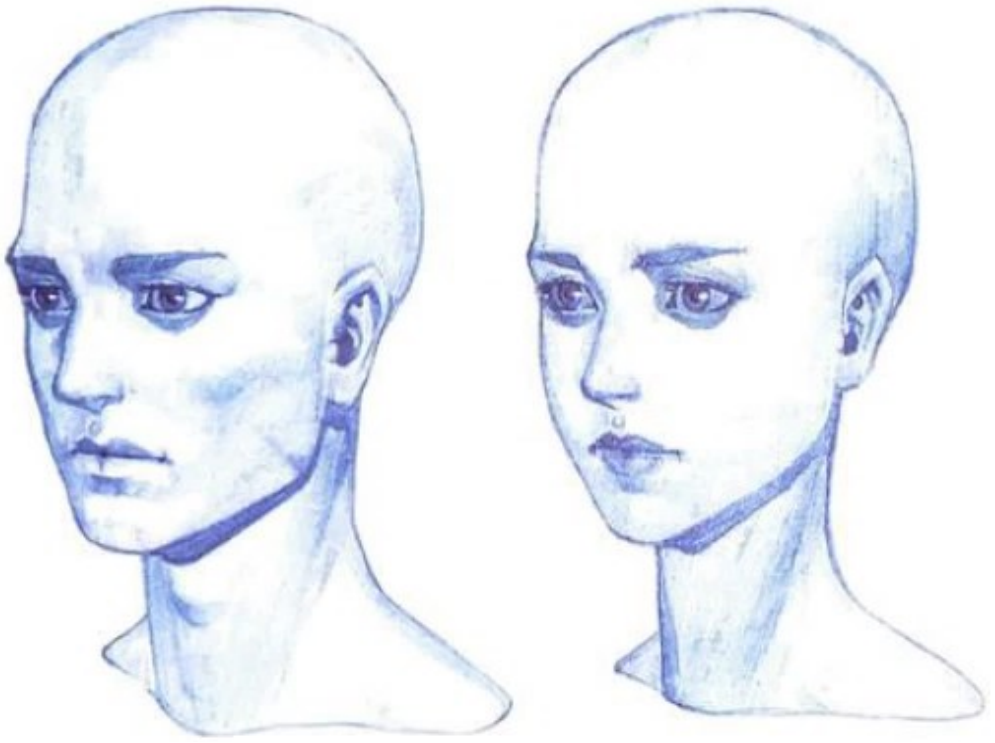
When viewed from the side, the slope of the nostrils is horizontal, but the slope of the bottom of the nose is not horizontal. In women, the protrusion of the eyebrow arch is gentler and the point where the bridge of the nose begins is lower. Additionally, the lower jaw is less developed than that of men, so the point that protrudes forward from the chin does not reach the baseline of the side line of the face.



Differences between male and female faces

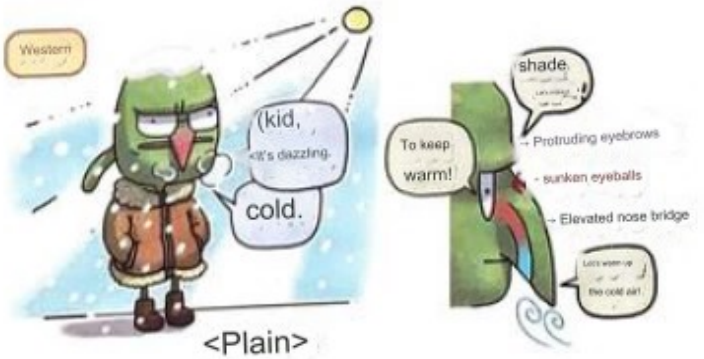
If you directly compare the frontal faces of men and women, you can see at a glance that the length from the upper eyebrow to the tip of the chin is shorter in women than in men. The jaw flow is straight in men and curved in women. The neck length is the same for both men and women, but women's necks are thinner and the height of the trapezius muscle is lower, making them appear relatively longer.

■ How is a standard face created?



Facial characteristics of Westerners and Asians

The appearance of the face develops in various ways depending on the climatic environment, topographical characteristics, and race, resulting in many differences in shape. Western people have developed eyebrow arches that serve as shade to protect the eyes from direct ultraviolet rays in the plains. Also, in colder regions, the eyeballs, which contain a lot of water, need to be protected by body heat to prevent them from freezing, so the eyes turn inward, and the tubes through which we breathe in to warm up the cold air become longer, making the nose higher. Because of this, Westerners have three-dimensional curves in their facial features. Asians do not have developed eyebrows because the forests block out sunlight. Due to the tropical climate, the eyes protrude and the lips become thicker to release the increased body temperature. There is no need for the nose to be high, so the overall face is flat. There is also a difference in three-dimensionality in the shape of the skull, with Westerners having a 'long head' that is long front and back, and Asians having a 'short head' that is flat on the sides. In paintings, faces with a proper mix of Eastern and Western characteristics are preferred. Rather than drawing several faces with different impressions from the beginning, it is better to practice a standard face sufficiently to maintain proportions from the front, side, and half-side angles, and then try changing the impressions based on this.



<Plain>

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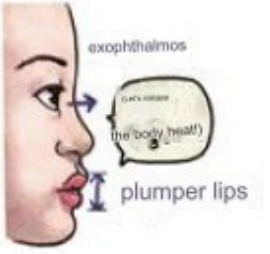
<Rain Forest>



■ Changes in impression and age according to proportion

Figure 1

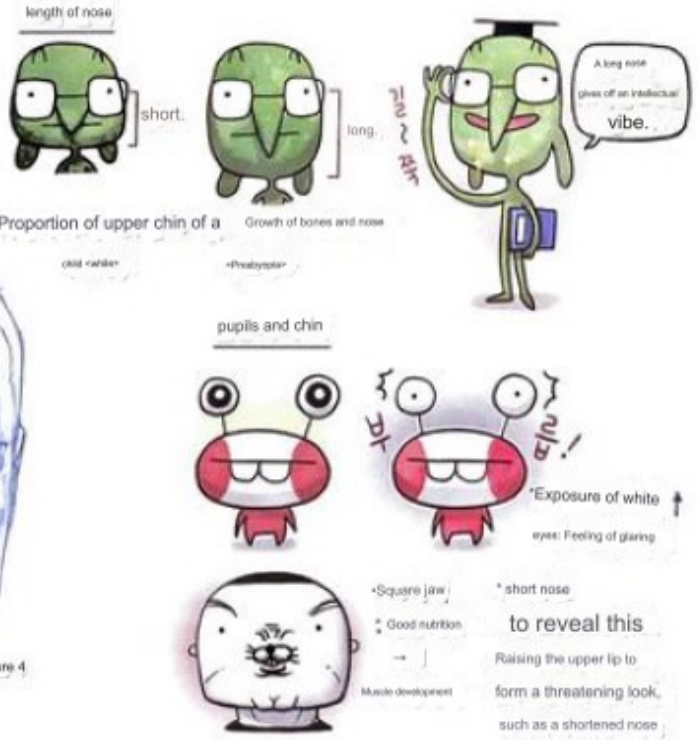
Figure 2

Figure 3

Figure 4

Figure 5

Figure 6



· As the nose area becomes longer as one becomes an adult, a long nose gives a mature impression (Figure 2).

Conversely, if the nose is short, it approaches the proportions of a child and gives a youthful appearance (Figure 1).

•Generally, when I get angry, I open my eyes and a lot of the whites of my eyes show. Eyes with this large white area give off an aggressive look (Figure 3). People who are physically muscular are more likely to have a square jaw because their facial muscles are also developed. So a square jaw gives a sturdy impression (Figure 4).

· As you get older, your body loses fat. This causes the outline of the facial bones to stand out and wrinkles to form. Skin that has lost fat causes the eyelids and earlobes to sag, making the eyes smaller and the ears longer and longer. Additionally, bone density decreases, causing overall bone deformation. In the face, the cartilage of the nose sags down, making the nose longer and curved like a hooked nose (Figure 5.6).

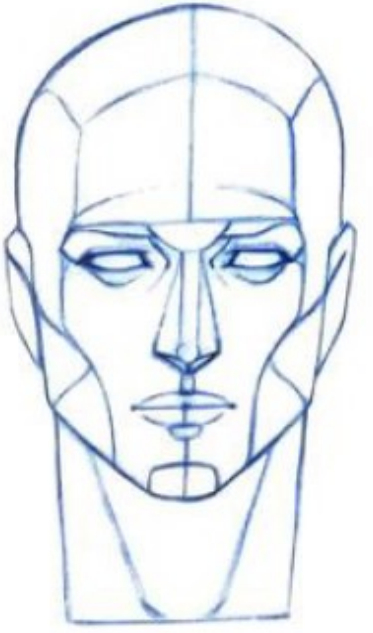
2 head 뼈

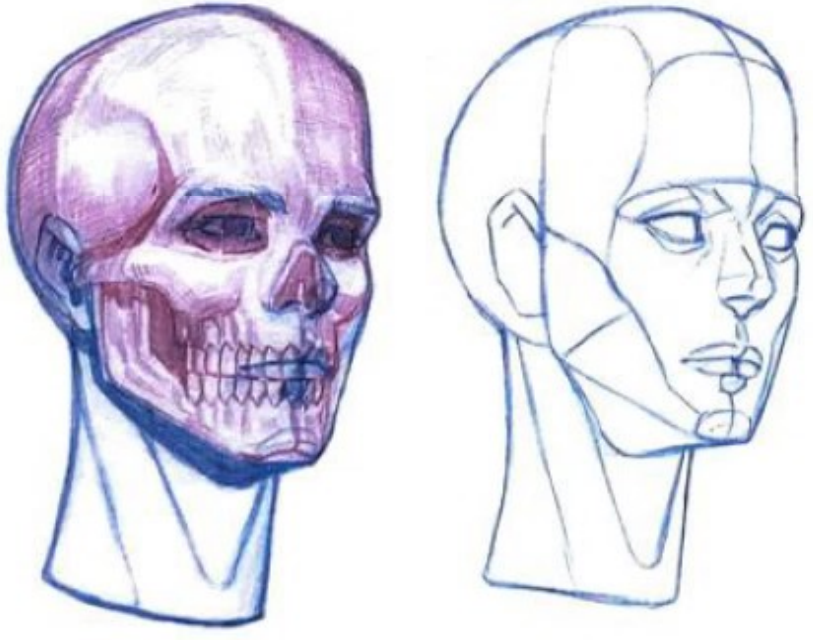
You need to know the skull to know where it bends.

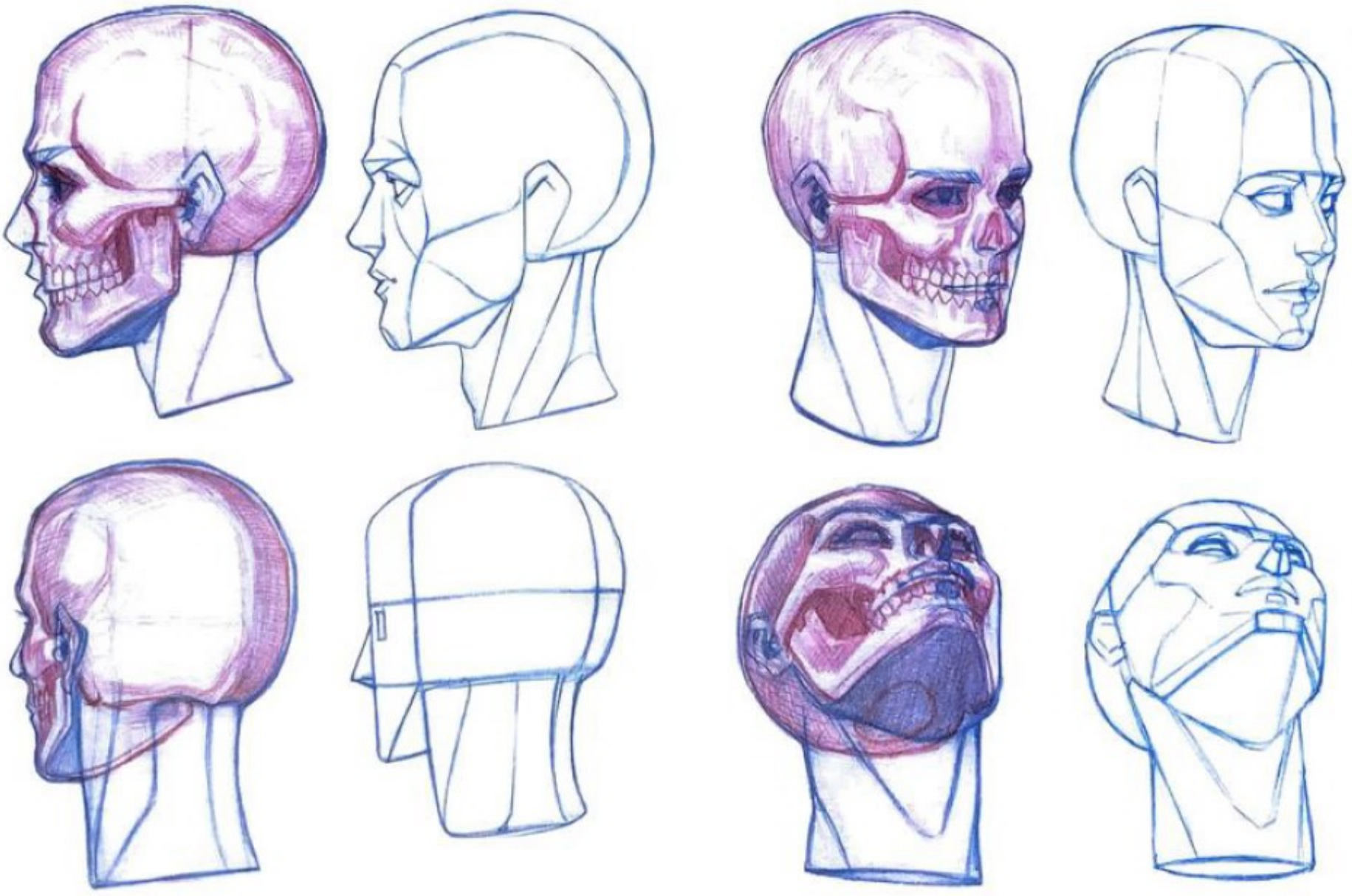
The skull (skull) has an overall spherical shape, but it is not completely round like a ball, but rather has the shape of an oval elongated from front to back.

The places where bones are touched are where the angles bend, most notably the eyebrow arches and cheekbones that protect the eyes.

The light and dark areas are divided according to the flow of the skeleton.





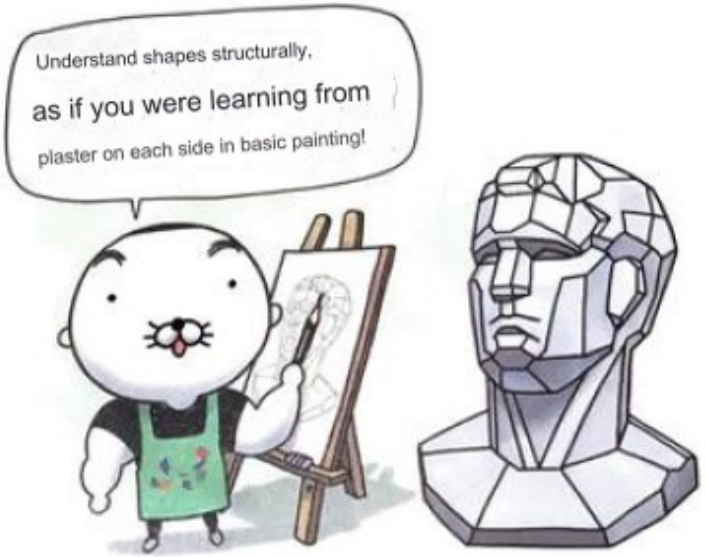


LQ&A

There are no sharp edges on the face, so why should we study each side?

If you approach the face only as a round face, it is difficult to understand the three-dimensional effect. So, when you need to add light and shade or draw various angles, you end up glossing over the shape. To clearly understand complex shapes structurally, facetification is effective. Split the face by omitting detailed curves and grouping similar areas together.

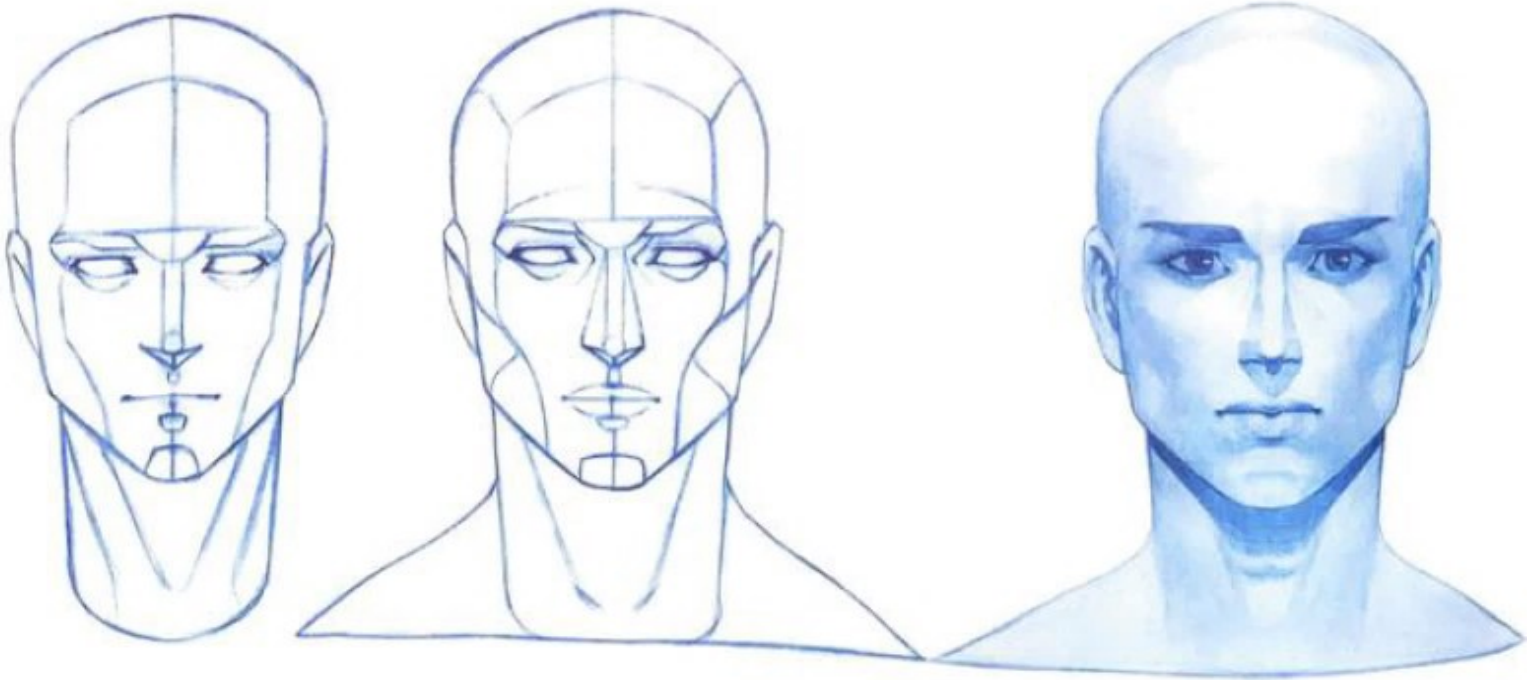
After establishing the main flow, the angles are gradually reduced to create the actual face.

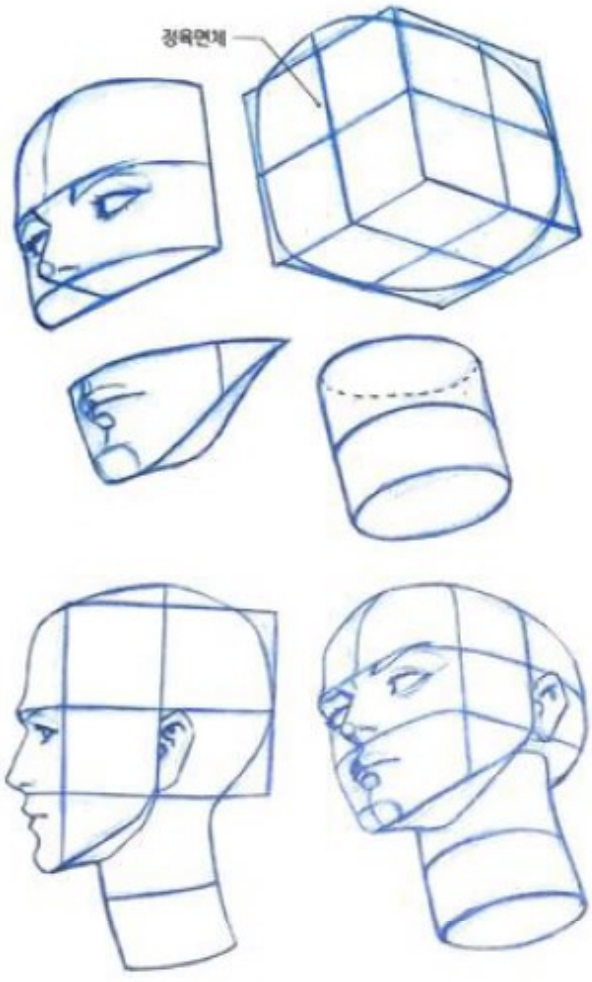


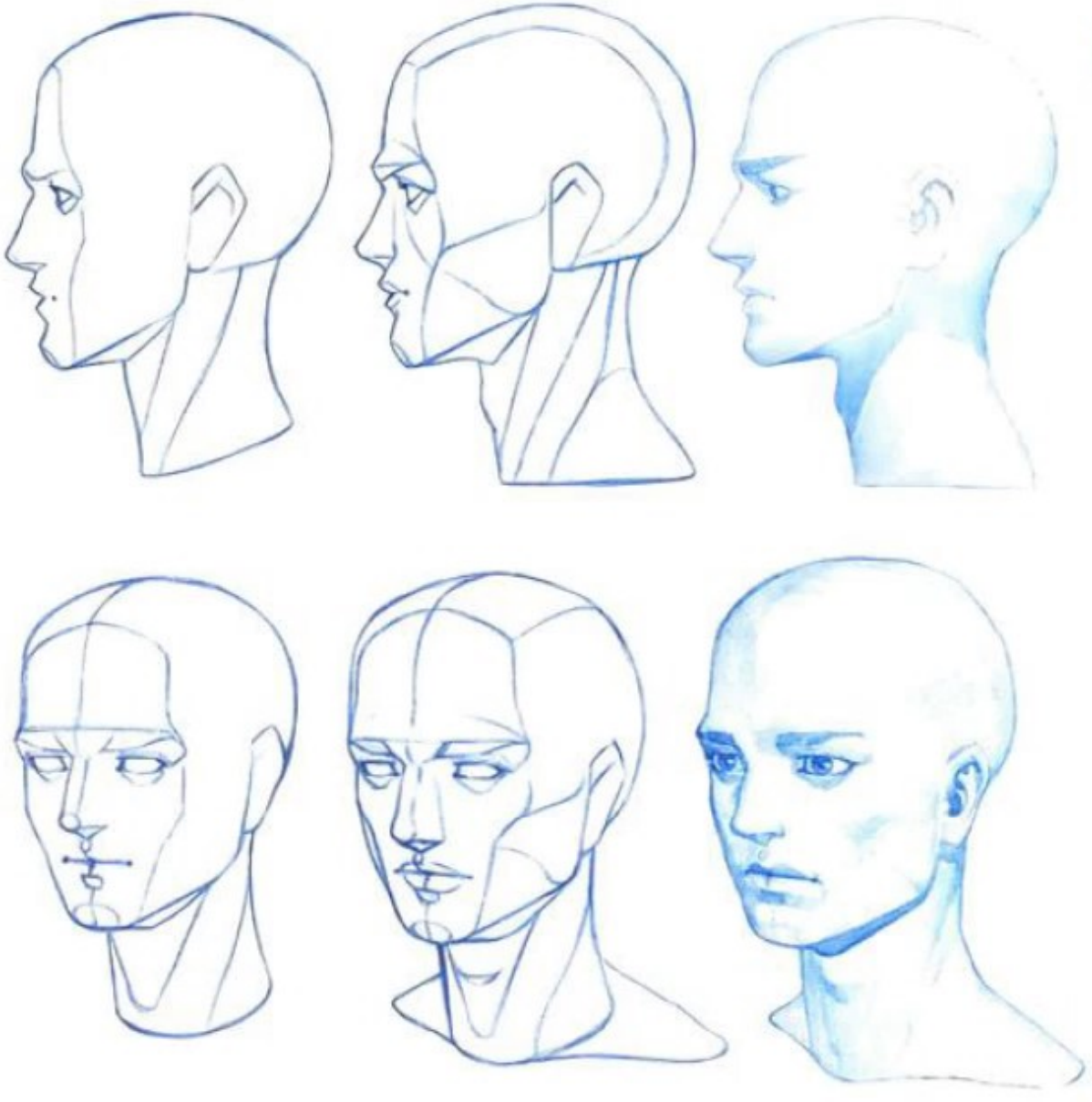
The order of facet painting

First, let's figure out the basic structure of the face by determining the exact positions of the eyes, nose, and mouth, then dividing the face into front and side views. Based on the front and side, the sides are subdivided according to the detailed muscle flow.

There are more cleavage areas around the cheekbones, eyebrow arches, and nose.

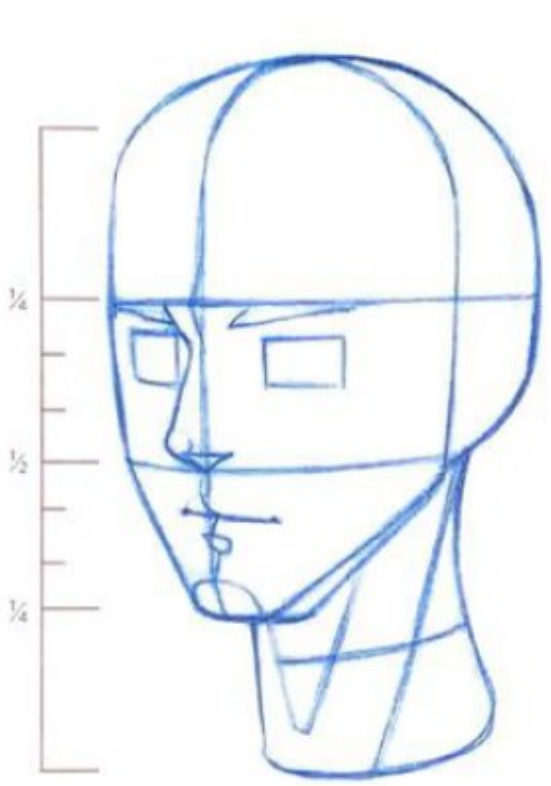


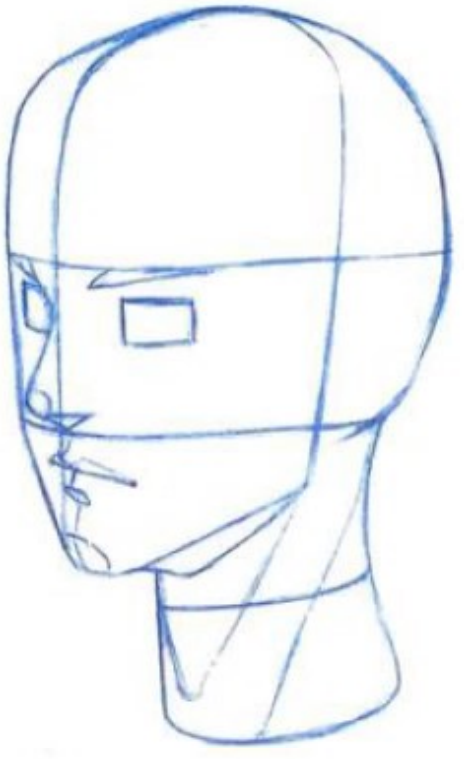


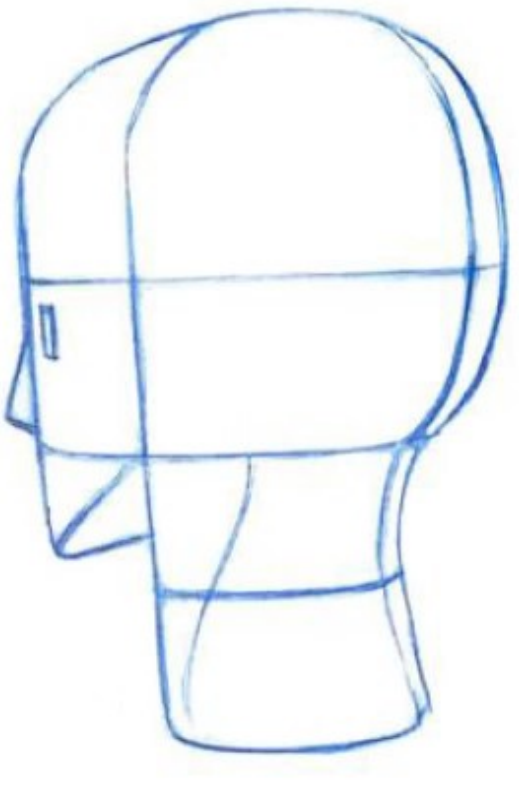


Thinking by segmenting facial shapes

It is easier to understand the structure if you think of the face shape as divided into four parts centered on the head, which is made of a cube.







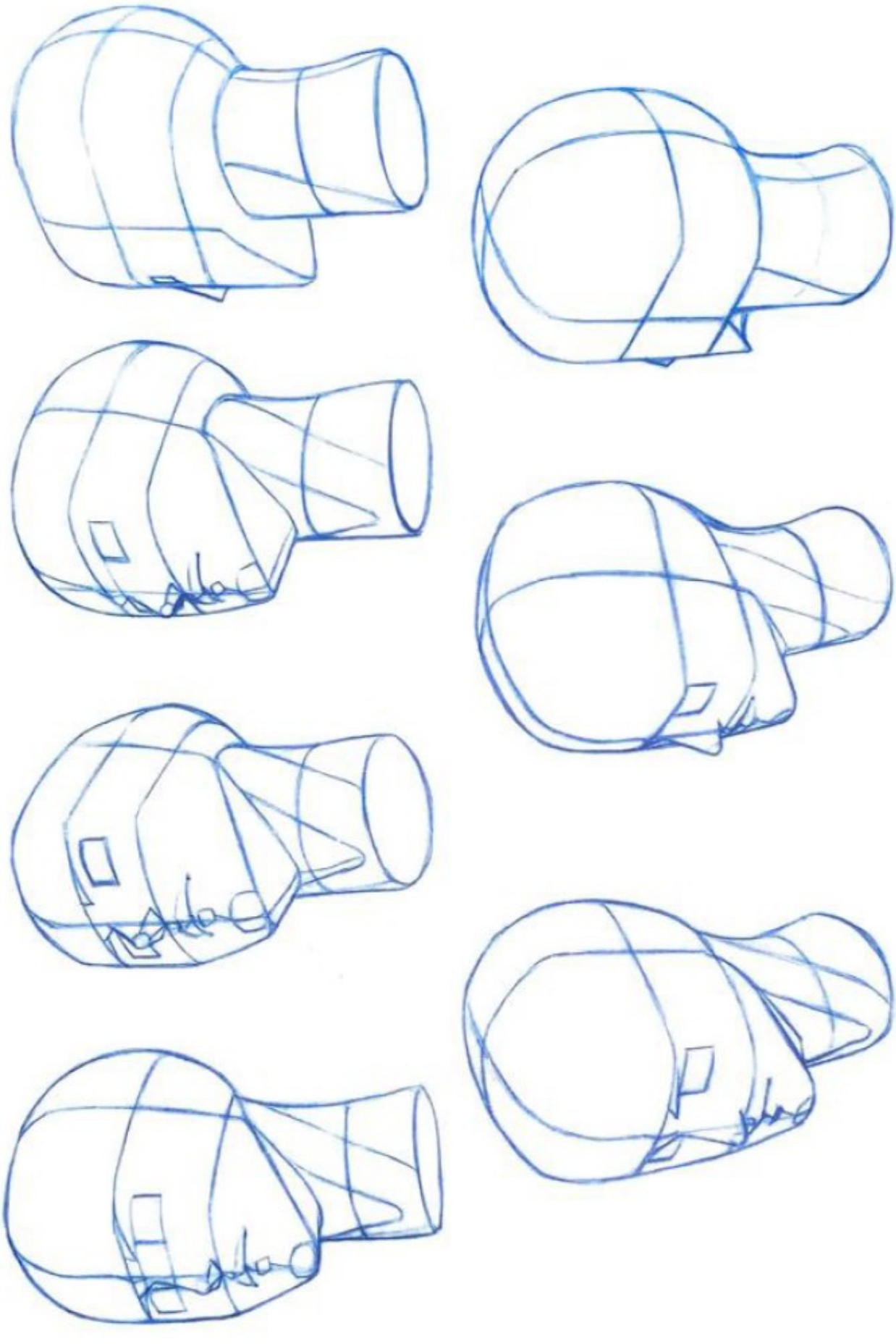
Simplify the shape of the head by focusing on volume

Just as we started with the bulky torso when drawing the whole body, we draw the bulky head first for the face as well. Draw horizontal proportional lines at the positions of the eyebrows and nose, and draw vertical center lines on the front and sides of the ilgul. These lines serve as a guide so that you can accurately recognize and draw the face at what angle it is facing.

If the shape of the eyes is square, the position and tilt of the eyes are symmetrical when the face is rotated.

And it's easy to measure the length at which the eye shortens.

Practice drawing shapes by observing how the proportions and slopes change depending on the various angles of the face.

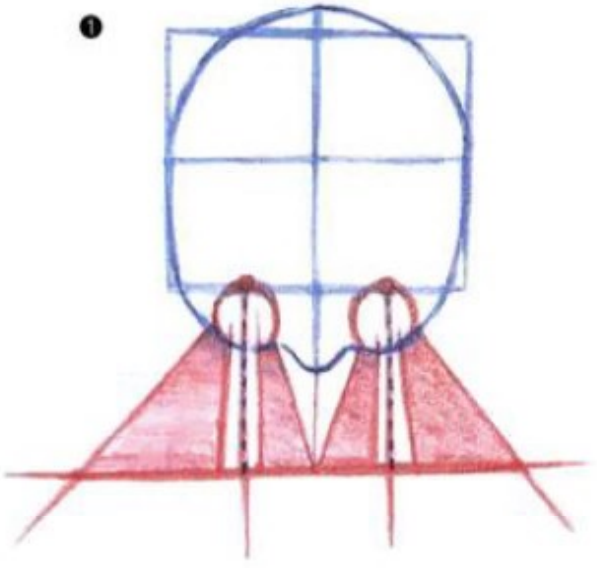


5 Shape of eyes, mouth and nose

• Understanding the eyes three-dimensionally

Humans are the only species with wide eye whites. Animals have a disadvantage in survival because if the whites of their eyes are clear, it is easy to see where they are looking. When hunting, your opponent will be able to read when you let down your guard, your emotional turmoil, and the direction you are trying to move. On the other hand, humans came to have wide white eyes in order to take such risks and communicate by exchanging glances in group life.

❶



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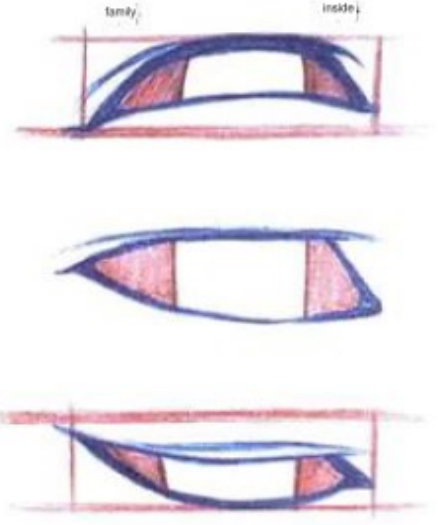

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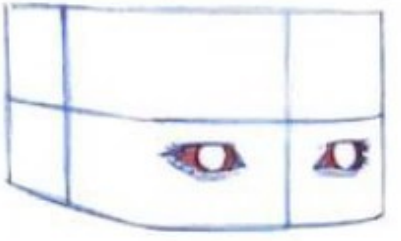


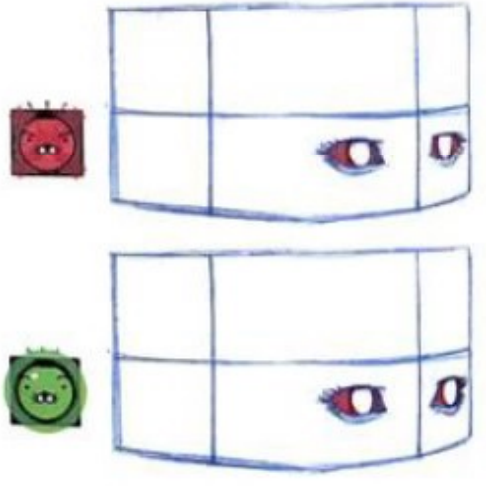
• Since the nose blocks the area between the eyes, the angle of view does not need to be wide inward, so the corner of the eye has a long slit laterally.

• The eyelids cover the spherical eyeball, so when viewed from above or below, they are curved like a crescent moon.

The point here is that the inside of the eye and its family must be drawn asymmetrically due to the outer corner of the eye being opened.

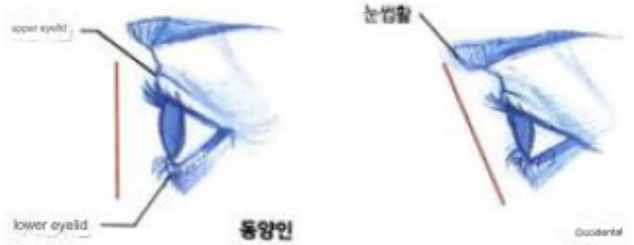
④ When you tilt the face, the outer corner of the opposite eye turns to the opposite side and the width of the eye becomes shorter. Please be careful not to draw the eyes symmetrically at angles that are not completely frontal.

오답노트 Shape of both eyes in hemilateral view



If you draw the white area of the eye symmetrically, it will come together like crossed eyes and the eyeball will look flat.

eyes of east and west

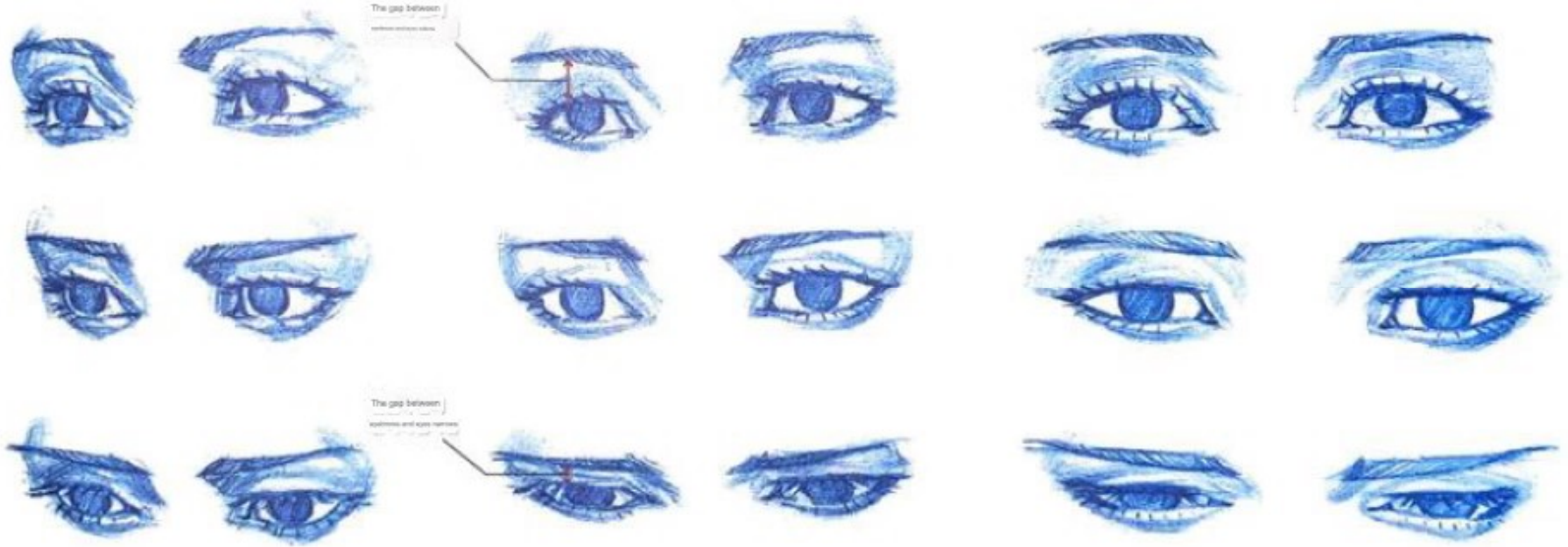


In Asians, the angle of the upper and lower eyelids is vertical.

Westerners have eyebrows that protrude and should be drawn diagonally.

Eye characteristics according to angle

When you look up from below, the gap between your eyebrows and eyes widens. Because the thickness of the eyelids varies depending on the viewing angle, you must carefully study the flow of the eyelids surrounding the eyeball. When looking down from above, the distance between the eyebrows and the eyes becomes shorter and the eyes are obscured by eyelashes. Be careful not to draw the lower eyelashes too dark.



■ Why does your mouth look like this?

Why human mouths are small

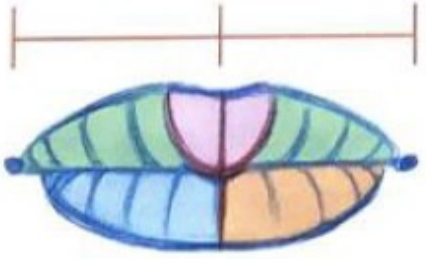
As humans started using their hands and no longer needed to bite prey with their mouths, their snouts became shorter, and as they no longer had to eat large amounts at once while storing food, their mouths became smaller in size. The lips are the part that radiates body heat and are thick because they have extra flesh for opening the mouth. An important point in understanding the appearance of the mouth is the structure of the lips covering the curved teeth along the curved teeth like a horse's hoof.

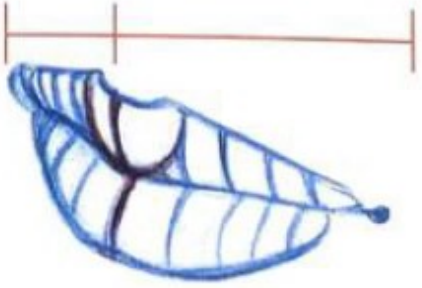
upper and lower lip

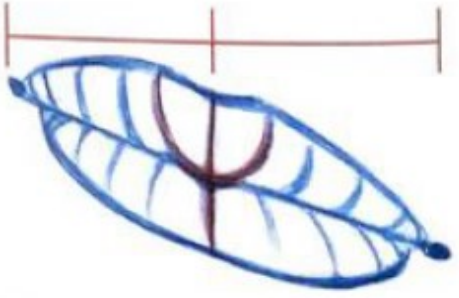
Why does the upper lip protrude further than the lower lip? This is not because the upper lip is thicker, but because of the way the upper teeth cover the lower teeth. Sometimes, when the lower teeth cover the upper teeth due to malocclusion, the lower lip protrudes further than the upper lip. For reference, the reason the front teeth are visible when the lips are slightly apart is because the center of the upper teeth is where the lips meet.

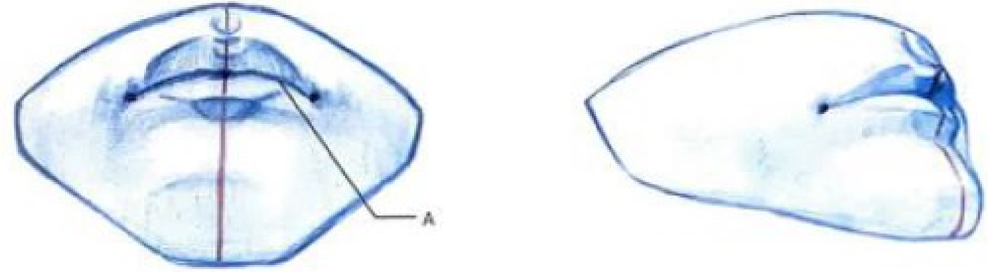
오답노트 structure of the lips

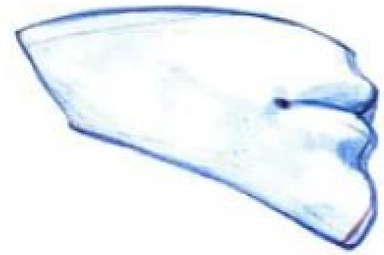
As shown in the picture, the shape of the lips can be roughly divided into two parts: the protruding part in the middle of the upper lip, the parts on both sides, and the lower lip. If you express the closed mouth line as a straight line or place the protruding part of the lips in the exact center as shown in the wrong answer picture, the mouth will have a flat, two-dimensional shape.

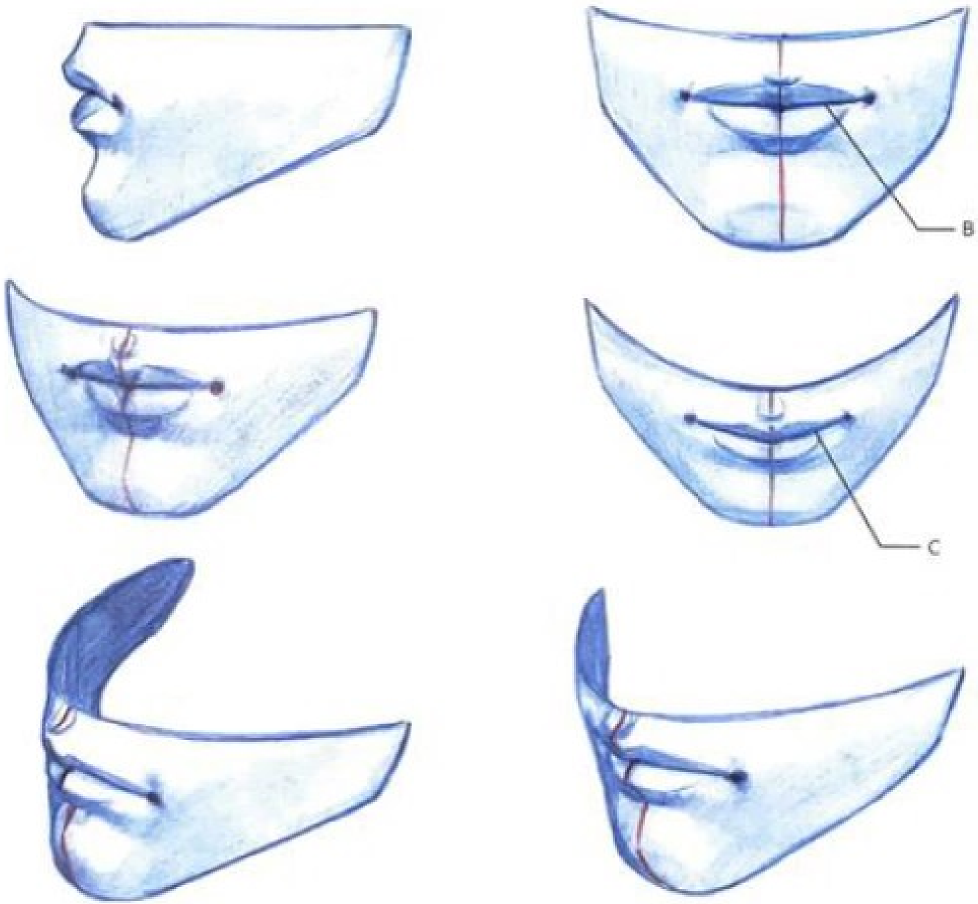












Different lip shapes depending on the angle

A: If you look up from below, the lower lip

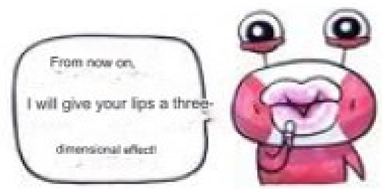
A line appears along the shape. B: When

the mouth is closed, the upper and lower lips are C: When

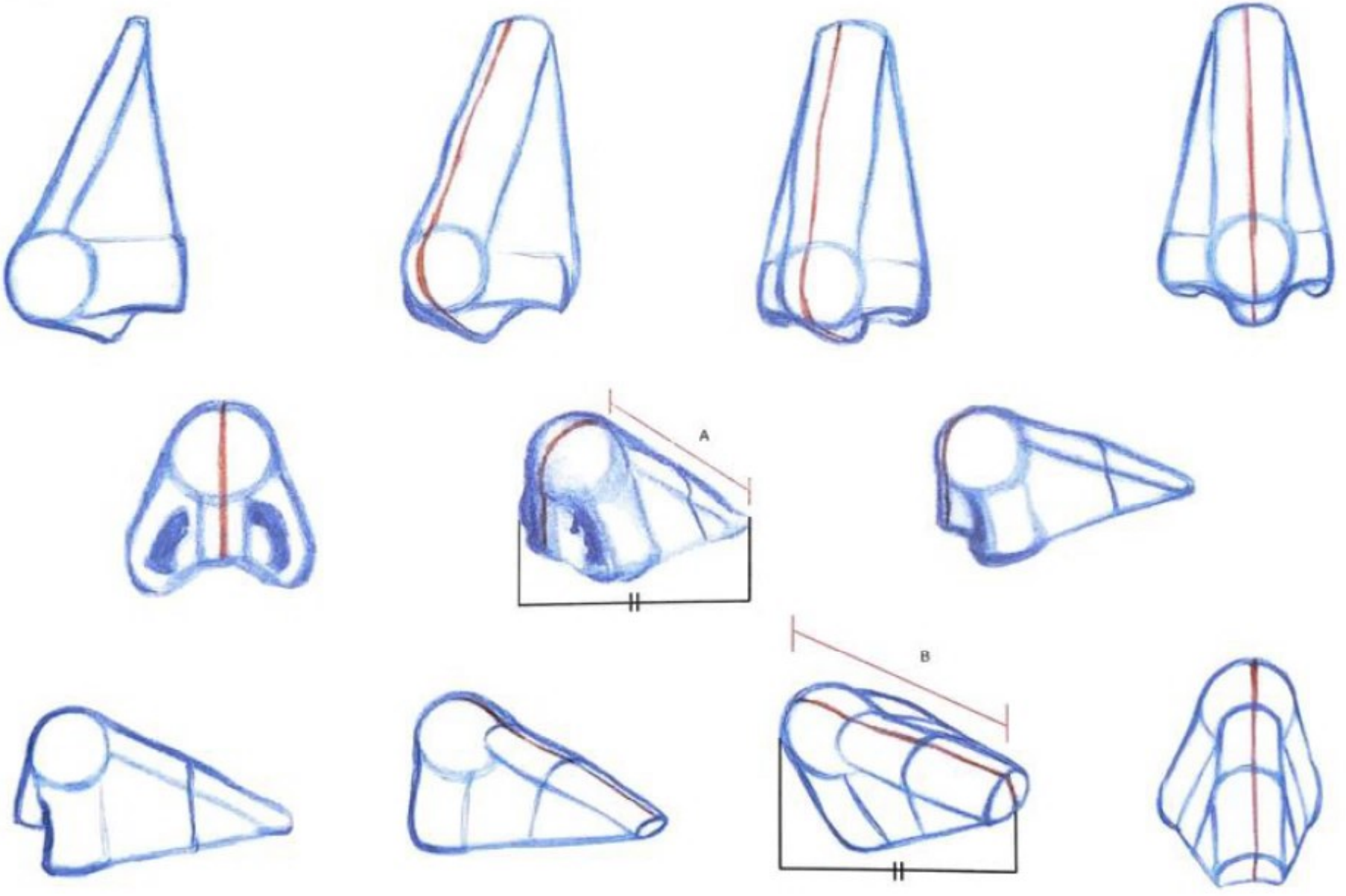
It's a line that touches each other.

looking down from above, the shape of the upper lip is

A line appears along it.



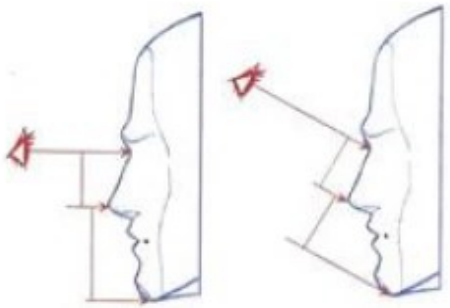
■ Understanding the nose by dividing the face



The nose, which is the highest point on the face, is the part that stands out for its three-dimensional effect. It is located at the center of the face and serves as a reference line to determine the direction of the face. At a low angle, like A on the left page, the lower part of the nose is visible and the length of the bridge of the nose is shortened. At a high angle, like B, the bridge of the nose is not shortened due to its slanted characteristics, making it look longer. Let's take a closer look at the picture.

Nose length changes depending on the angle

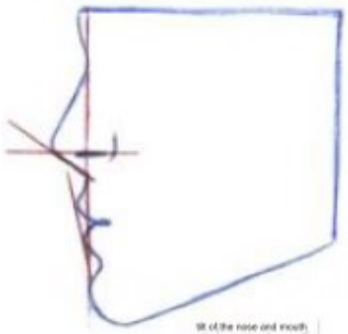
When the face is viewed from a horizontal angle, the length of the nose appears shorter than the length from the tip of the nose to the tip of the chin, but at a high angle, the length of the nose and the length from the tip of the nose to the tip of the chin appear to be almost the same. If you look at the face from a high angle like this, you can observe that the length of the nose is relatively longer.

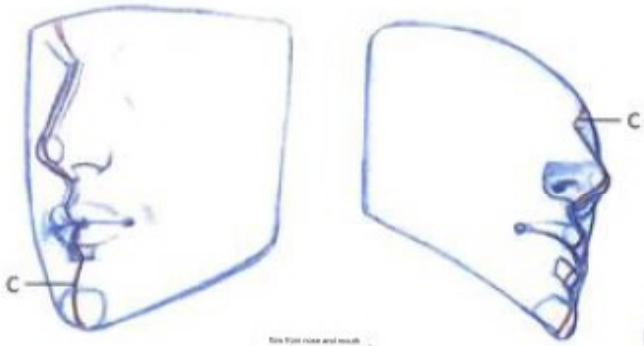


high angle

Shortened, low-angle nose

High angle nose with no shortening

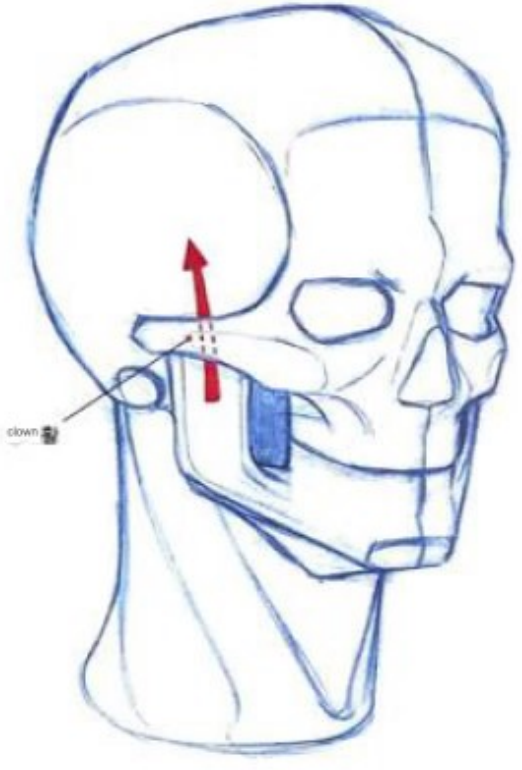


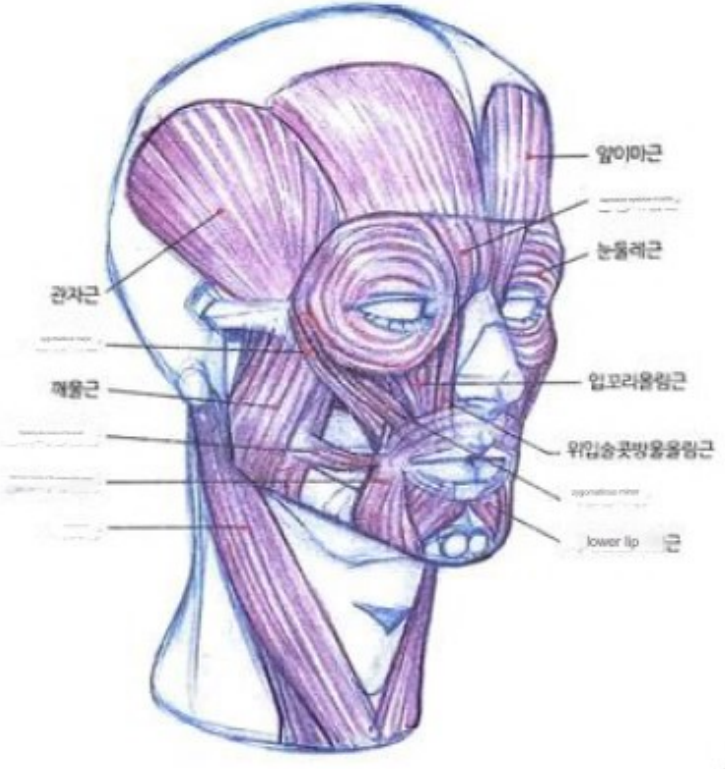


Compare the slope of the nostrils, the slope of the lower nose, and the slope of the upper and lower lips to understand the shape. Look closely at the flow of the hill created by combining the nose and lips through C, the center line of the face. If you can structurally understand and express the green area that appears beyond this most protruding part of the face when drawing a half-side face, you have a good understanding of facial structure!

• Facial muscles and expressions

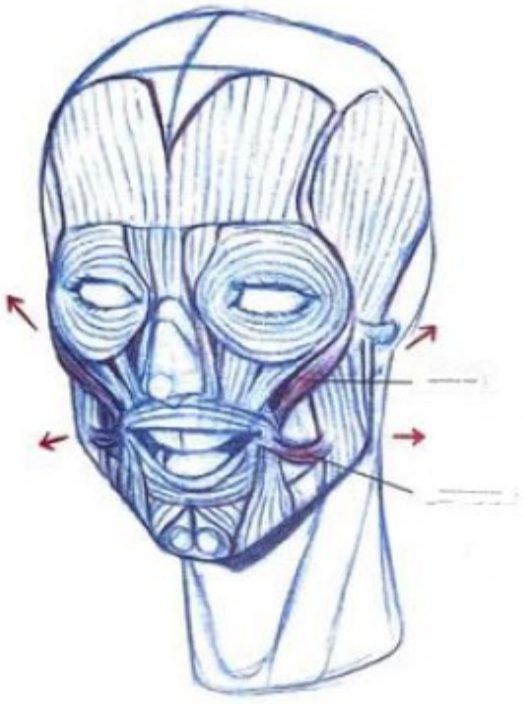
■ Why are there so many muscles in the face?

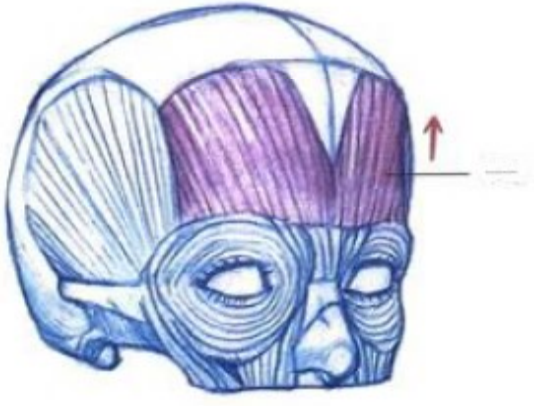




muscles of the face

The empty space between the zygomatic arch, which runs from the cheekbones toward the ears, and the skull creates a passage for the muscles on the sides of the forehead to connect to the lower jaw. Also, by looking at the direction of the muscle fibers, you can tell which direction the muscle is contracting, so you can predict the muscle's use. Many muscles are connected at the corners of the mouth, making the corners of the mouth plump and prominent. The muscles related to facial expressions are not attached from bone to bone, but from bone to skin, so facial expressions are created by pulling the skin. The attachment of muscles from bone to skin is a feature that can only be seen on the face.

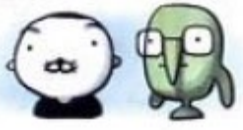




muscles used when laughing

The muscles that are most commonly moved when undressing are the zygomaticus major and the corrugator muscle. The reason the nasolabial folds appear and the cheekbones protrude is because the fat has been pushed out. The raised cheekbones also affect the eyes, creating half-moon shaped eyes. When you smile, it is natural for only your upper teeth to be visible. When the lower teeth are visible, it can easily give the impression of a fake smile or a maniacal smile.

(I can't explain the shape of the work)

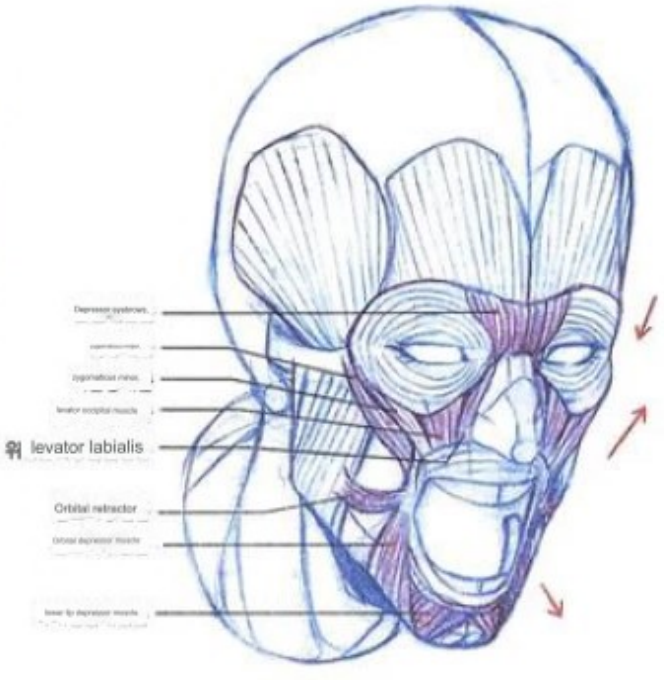


RIt feels kind of scary when the lower teeth are revealed.

Forehead muscles that raise eyebrows

If you look at older people, there is no one without wrinkles on their forehead. You can see that we often make facial expressions such as raising our eyebrows since we were young. If you are just a little conscious, you can see that the forehead muscles are used not only when looking up at something or making a surprised expression, but also in various facial expressions. Wrinkles on the forehead occur when the forehead muscle contracts and the excess flesh overlaps. Even now, you are probably contracting your forehead muscles unconsciously.

▪ Characteristics of an angry face



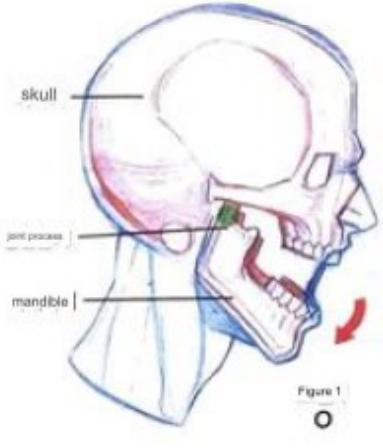


Figure 1

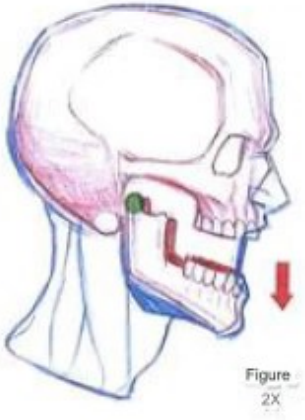
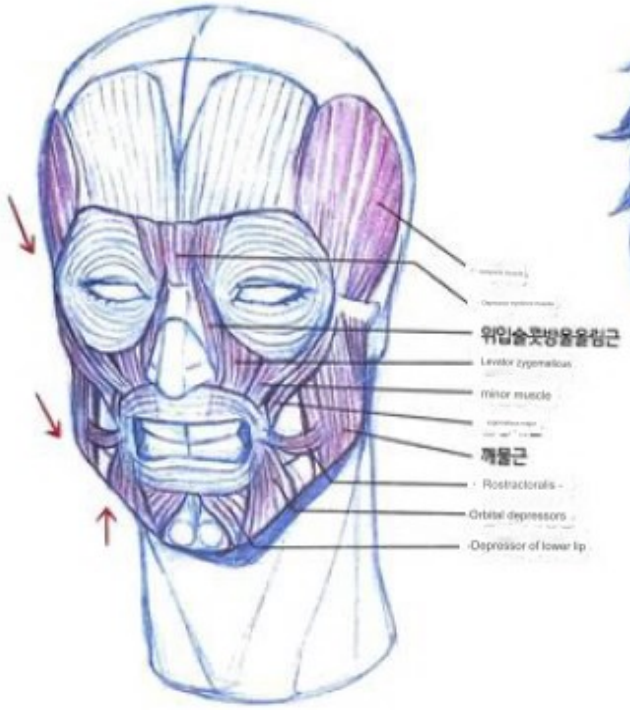
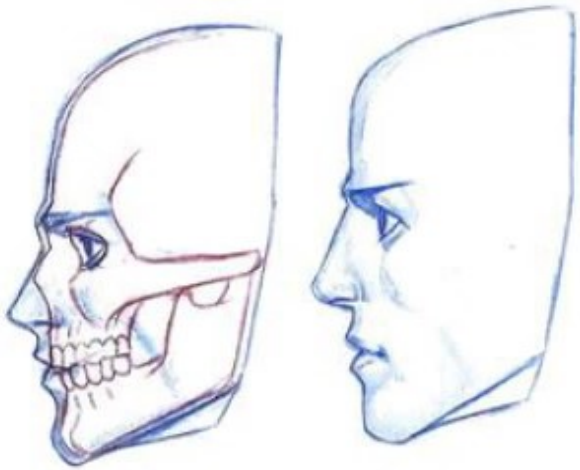


Figure 2X

Yelling expression

Frowning and yelling use more muscles than a smiling face. The key point in this facial expression is the movement of the jaw joint. As shown in Figure 1, when the mouth is opened, the lower jaw bone should curve around the articular process. However, many students often make the mistake of opening their mouth vertically rather than in a curved motion as shown in Figure 2. When the mouth is opened vertically, the temporomandibular joint is dislocated, and bone anatomy shows that this is an impossible movement. Keep in mind that the articular process is a joint that connects the skull and lower jaw, so it should not be dislocated.





When you clench your teeth, the masseter muscle becomes more prominent.

A frowning expression showing teeth

This is the facial expression that uses the most muscles among the facial expressions so far. This facial expression, where the animal bites its molars tightly and exposes its teeth to threaten the opponent, is also observed in many other animals.

The reason why all animals have stronger force to close their mouths than to open them is to bite prey or chew food. As a result, the amount of muscle that closes the mouth is much greater than the amount of muscle that opens the mouth. As you can see from the facial expression above, when the mouth is closed, it feels more threatening than when the mouth is open. The muscle that closes the mouth is divided into the temporalis muscle and the masseter muscle. The temporalis muscle is a muscle that has the endurance to lightly close the mouth, and the masseter muscle is a muscle that exerts strong strength when chewing something hard.

<Weak jaw exercise> Temporalis

muscle contraction

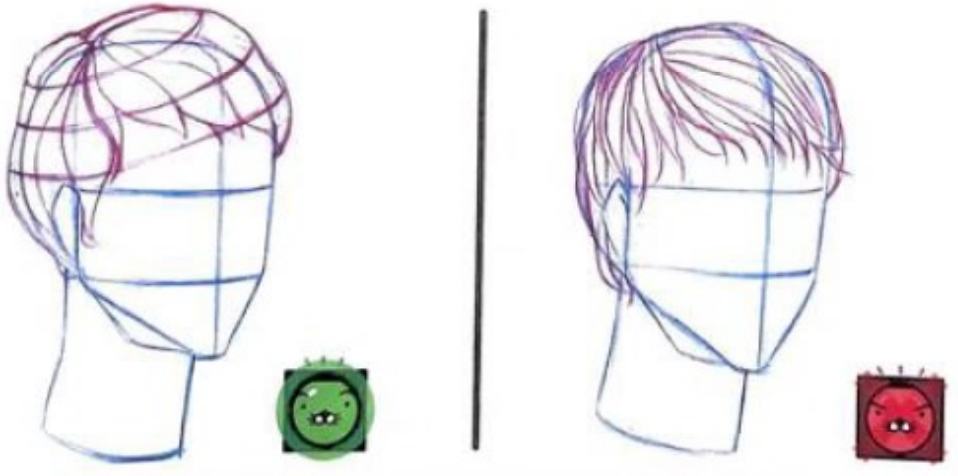
<Strong jaw exercise> Temporalis

muscle + masseter muscle contraction

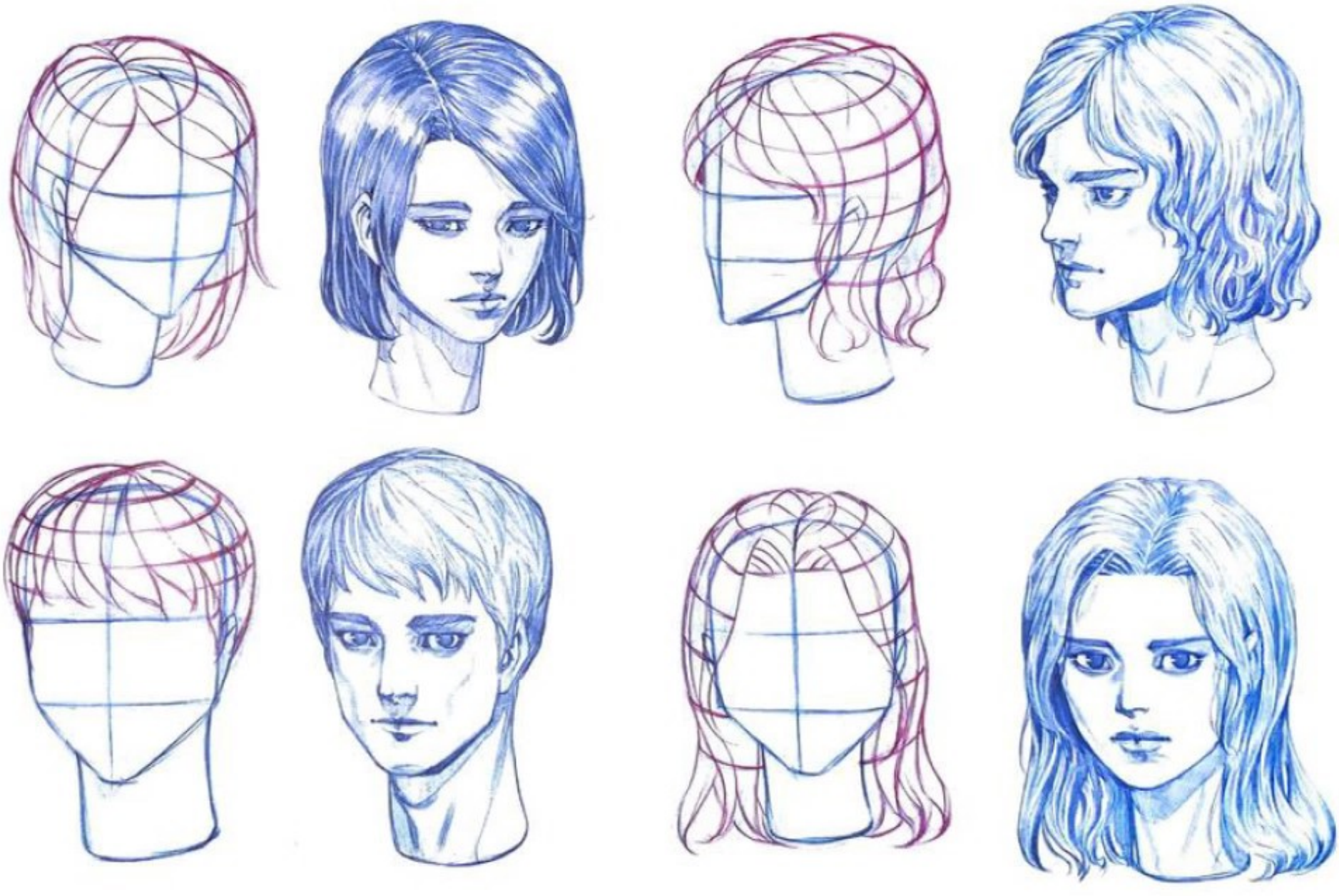
7 natural hairstyle

When drawing a head, you should be aware of the shape of the head and draw the volume of the hair to avoid mistakes such as drawing the hair into the head or drawing it too loosely. The line where the hair starts also differs depending on the gender, with men having an angled M-shape border and women having a round border. When expressing hair, rather than drawing it as if it were a single strand, you should take the whole thing as a large chunk and divide it into smaller strands as you get closer to the end of the hair. This is because the hair is bundled up and piled on top of each other. Tufts of hair extend from whorls or partings, creating a regular direction.

obot | Hair volume and direction



Since hair is piled up on the head in layers, it needs to add volume. If you draw it exactly along the skull line, it will look like a sparse head with no tassels. The direction of hair should be described after establishing a major flow centered on whorls or partings. These features are more important for characters with long hair, right?



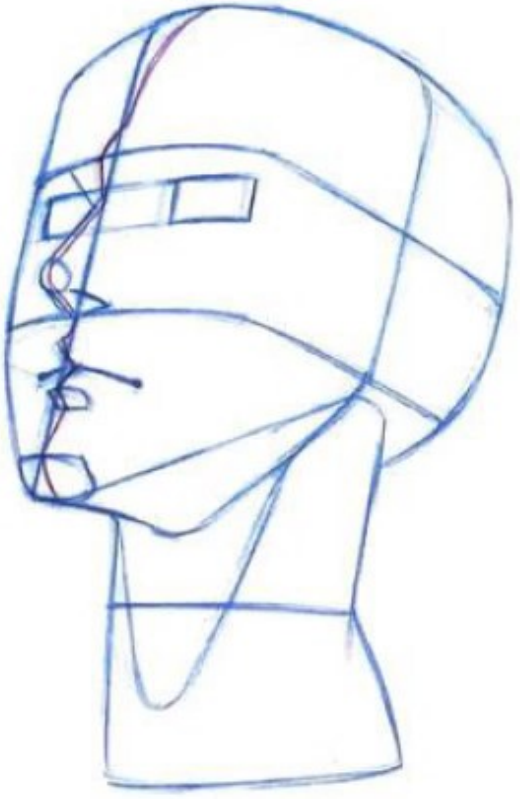
Various hair styling

The position of the whorl and parting has the greatest influence on the hairstyle. Professional design elements are added depending on the length of the hair, so rather than trying to create a style from your imagination, you should draw it by referring to professional hair materials to express a sophisticated style that suits the times.

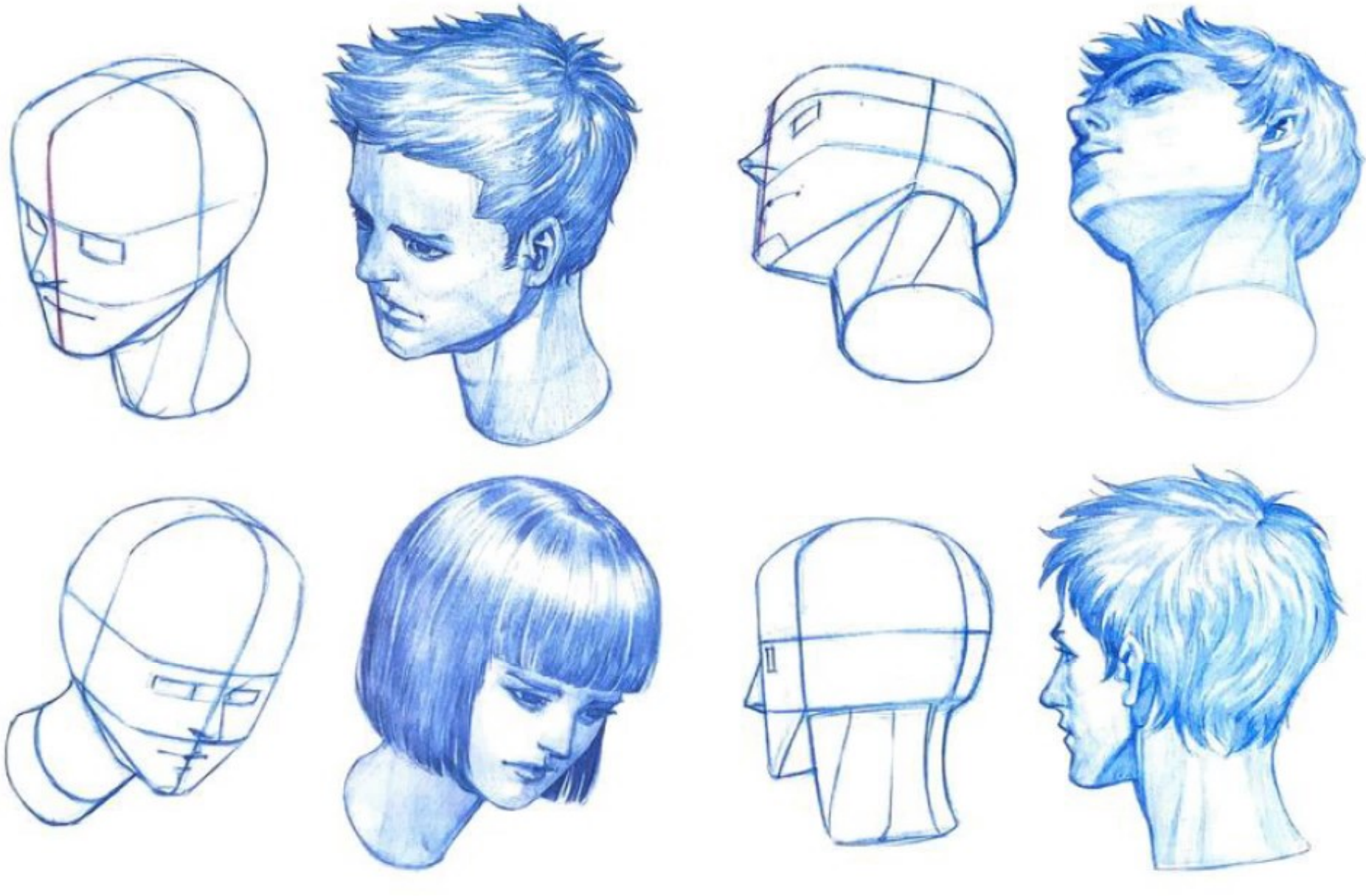





8 Rotate various angles

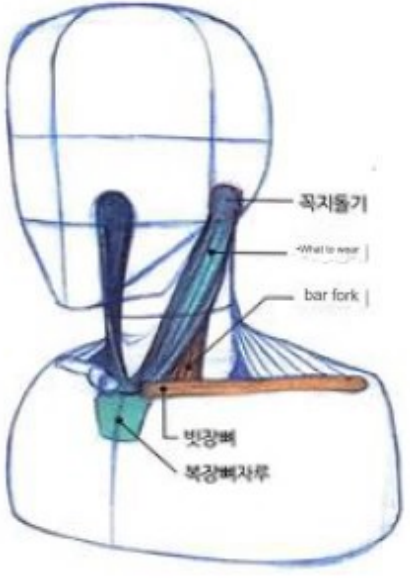


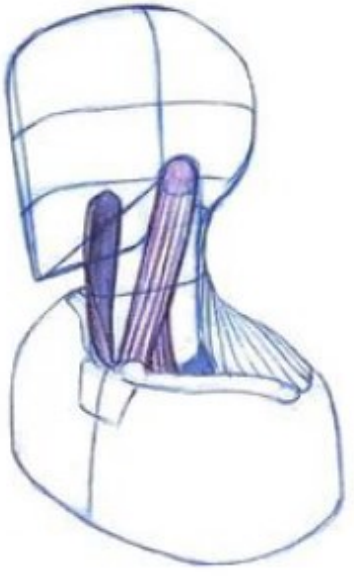
We recognize faces more accurately than other objects. Additionally, because the shapes of the eyes, nose, and mouth that make up the face are complex, it is necessary to understand the correct proportions and shapes when turning the angle. No matter how accurately you understand the shape of each eye, nose, and mouth, you cannot draw various angles if you lack understanding of other areas of the face. In order to understand the area that connects the eyes, nose, and mouth, it is necessary to practice developing into facet drawing through the skeleton-based figure drawing stage. When drawing a face, you must first determine the direction of the face, draw the overall volume of the head accordingly, and then adjust the proportions and positions of the eyes, nose, and mouth according to the angle. In order to add light and dark to the polarization, the flow of the facial skeleton must be understood from each side.

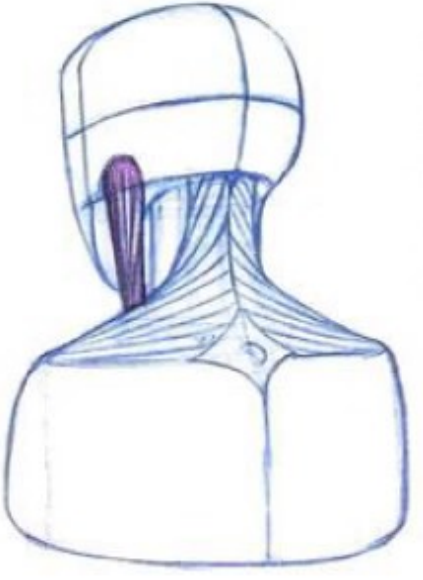


9 Neck muscles and movements

• The most prominent sternocleidomastoid muscle (sternocleidomastoid muscle)



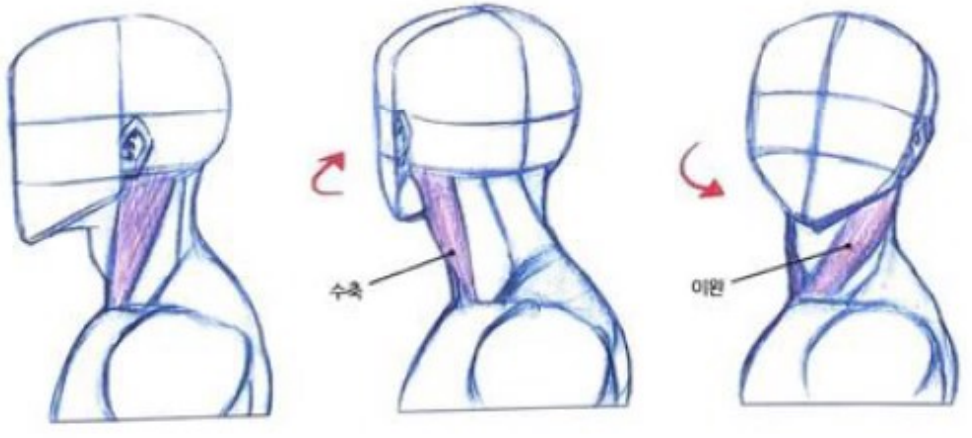




starting point and ending point

Try touching behind your ear. The bones are sticking out, right?

This place is called the 'tip projection'. The sternocleidomastoid muscle starts from this apical process and is divided into the 'sternal fork', which goes to the sternum and attaches to the clavicle, and the 'clavicular fork' which connects to the clavicle.

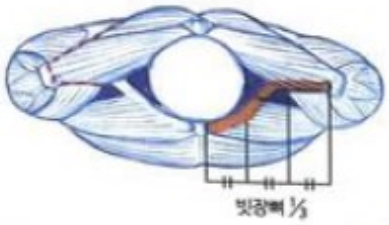


Use

It has the effect of turning your head left and right and leaning forward.

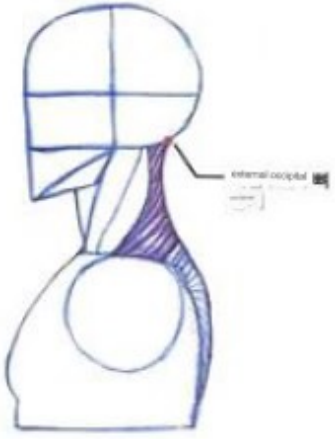
The sternocleidomastoid muscle has the greatest influence on the outline of the neck and its thickness is prominent, so it is an important indicator that cannot be omitted when expressing the neck. There are several muscles in the neck other than the sternocleidomastoid, but they are not easily visible on the outside, so it seems natural to express only the sternocleidomastoid and trapezius muscles and tie the rest into a cylinder.

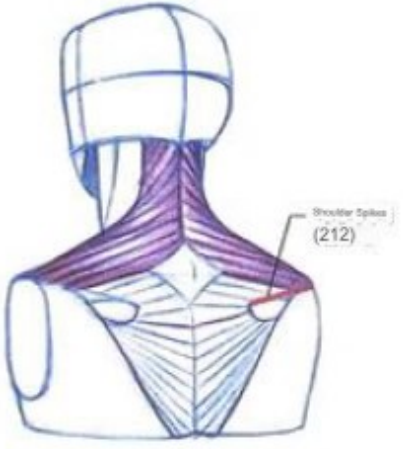
*Upper trapezius muscle (kapectus muscle), which resembles a bridge

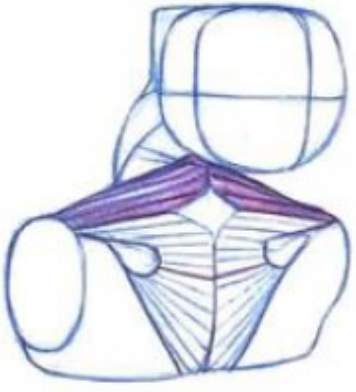


starting point and ending point

The upper trapezius muscle originates from the external occipital eminence and attaches to the spine of each scapula and the family of the clavicle. We will learn more about the entire trapezius muscle later.

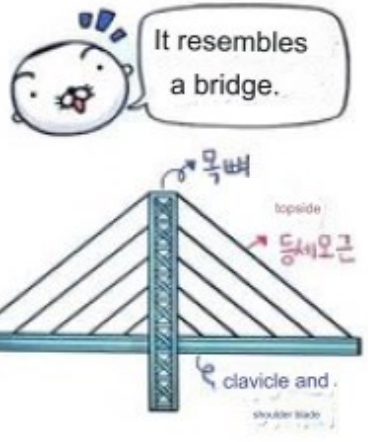




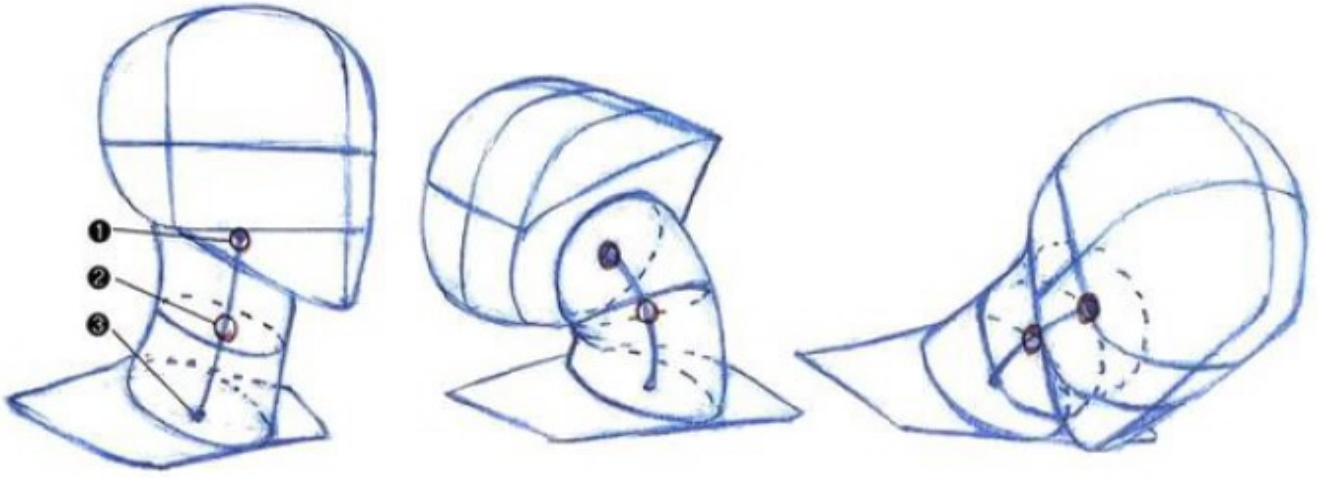


Use

The upper trapezius muscle lifts the head, bends it to the side, and rotates it, and connects the clavicle and shoulder blade to the cervical spine to support the shoulder.

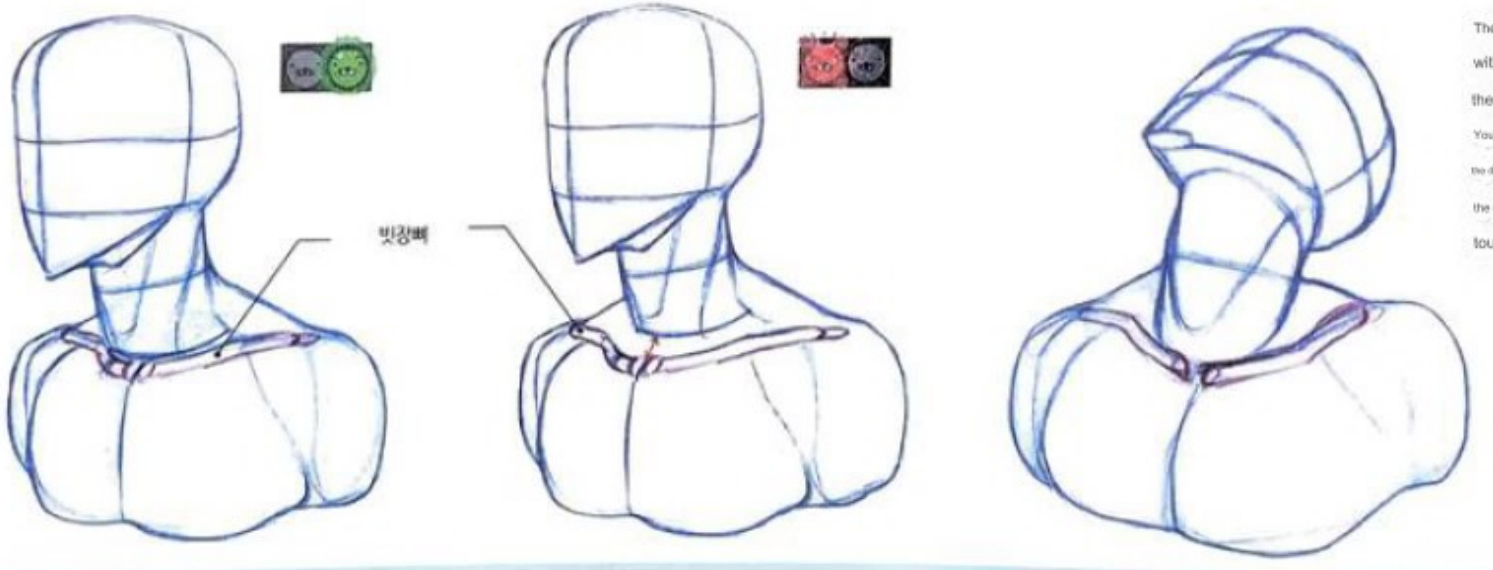


■ Easy-to-understand neck movements



The cervical joints are located in the center of the neck. When the neck is lifted backwards, it bends more than when it is bent forward, and wrinkles form at the nape of the neck. When the neck is bent back and forth, the apparent length changes, so you must always think about the movement of the neck based on the central skeleton. When you move your neck, the joints around number 2 bend the most. The degree of bending of the joint in area 2 is not large, so it only serves to assist the movement of the joint in area 2. When you turn your head left or right, you rotate left and right around joint number 2.

오답노트 Distance between clavicle and neck



The clavicle (clavicle) is in contact with the starting point of the neck. Be careful not to

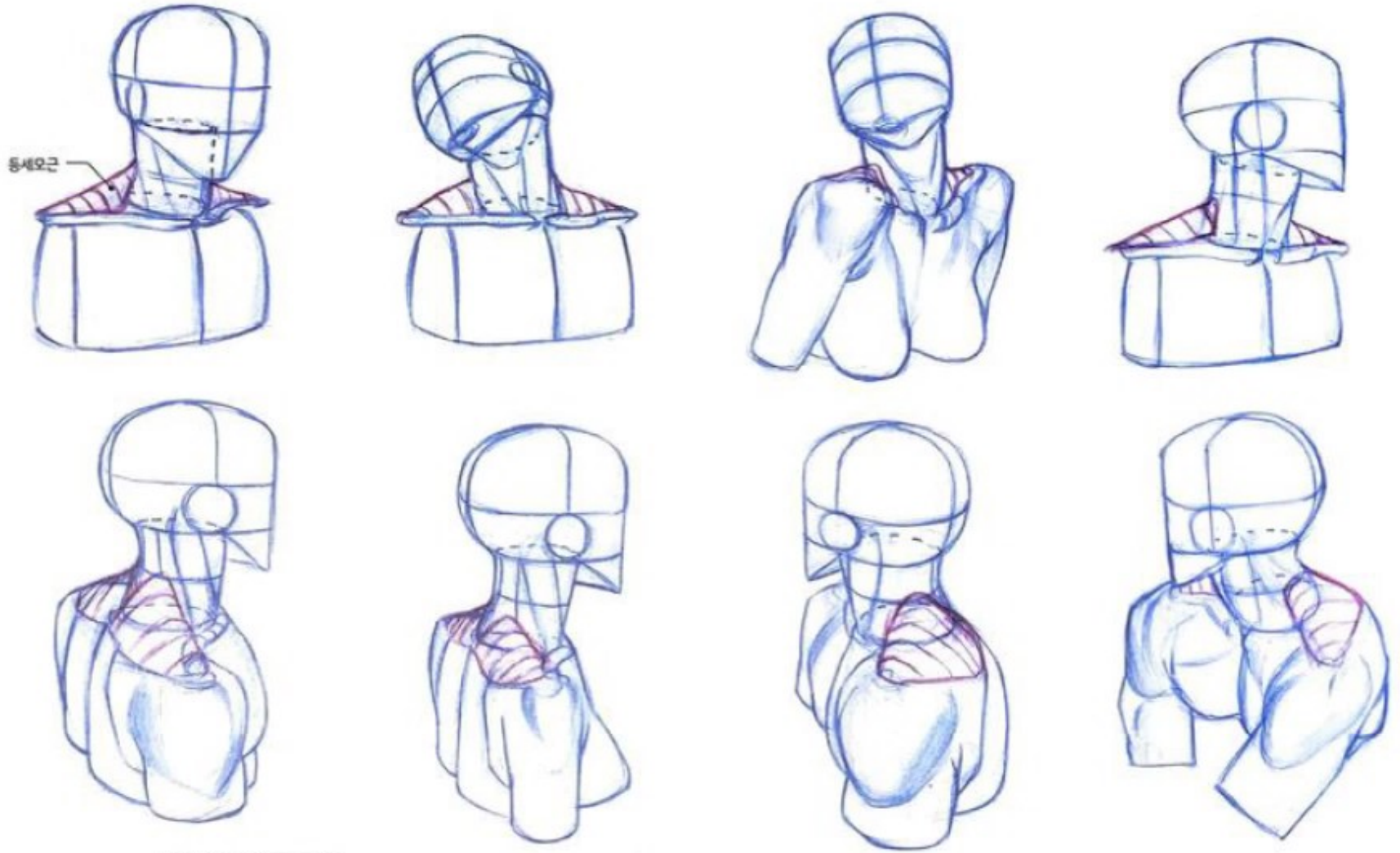
You can tell right away. Draw

the distance between the neck and

the clavicle to be apart.

touch this part yourself!

The starting point of the neck and the clavicle are in contact.



Changes in the shape of the trapezius muscle

Rather than thinking of the connection between the neck and the trapezius muscle as the same flow, it is better to think of the neck as a cylinder and the trapezius muscle as an unfixed form, as shown in the picture. This is because the shape of the trapezius muscle changes depending on the position of the tip of the shoulder.

Muscle structure and action

Why were Leonardo da Vinci and Michelangelo so obsessed with anatomy even though they lived in a time when human dissection was taboo?

Even though I created the work with an actual model in front of me. The two artists felt the limitations of creating works with only superficial information. In the end, I was able to dramatically improve the level of depiction of the human body by directly studying the internal structure of the human body. If you rely only on reference materials without a structural understanding, it will take a lot of time to find materials that fit the posture or angle you want to draw. Also, due to the model's unusual body shape or lighting angle, there is a possibility that the human body may be drawn incorrectly due to inaccurate shapes. Those who draw illustrations or comics must be able to create and draw characters from various angles and in various postures without a model.

In other words, it is essential to know the structure and operating principles of the human body. Sometimes, there are educators who say that there is no need to place much emphasis on studying anatomy. Rather, studying anatomy harms the naturalness of the human body. From the perspective of writing a human anatomy book, my opinion is that the human body should not be studied through anatomy alone, but anatomy is definitely an essential subject to properly create the human body. Of course, if you draw the human body with too much focus on anatomy, the human body will be drawn rigidly or have an unnatural flow, as argued by the educators mentioned above. However, you should not neglect studying anatomy due to concerns about these side effects. In order to draw the human body naturally, you must study anatomy in depth and then be able to apply it according to the situation. Therefore, I think it is a good attitude to study anatomy not with the mindset of 'If I can't study it perfectly, I won't do it at all,' but with the mindset that 'I will study properly and then apply it as needed.'

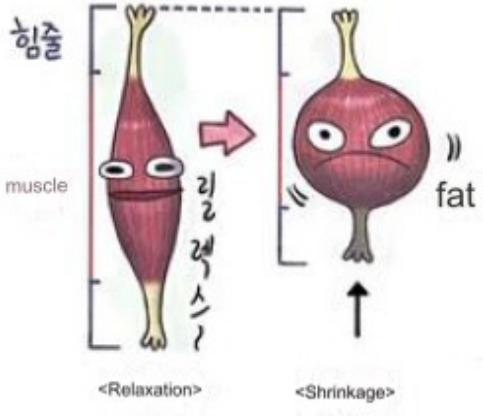
A good understanding of the human body will provide you with a solid foundation to express what you want to draw without any hesitation. We will open the chapter on human anatomy by emphasizing once again that exaggeration, reduction, omission, and transformation of the body are possible based on understanding the basic shapes.

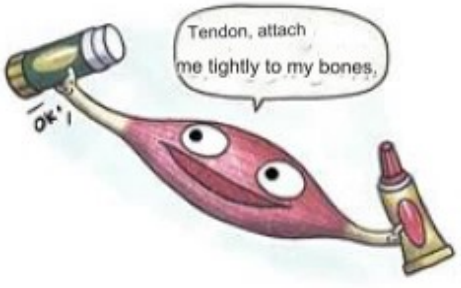
Rather than deciding and starting,

While practicing croquis

The moment you get curious, look it up.

You will learn a lot more.





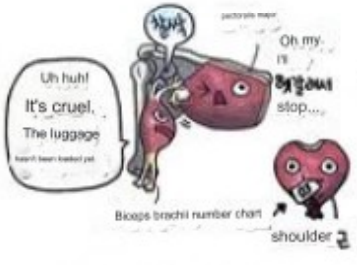
If you learned the movements of joints with a simplified skeleton in 'Chapter 1 Human Figure Drawing', in this human anatomy part, you will learn about the muscles attached to a more realistic skeleton.

First, muscles are made up of sinews and tendons, and when force is applied to the muscles, the length of the tendons shortens and their volume increases. On the other hand, tendons do not contract or relax. Tendons act as an adhesive that attaches tendons to bones, so tendons are always present at the ends of tendons. This tendon varies in length and area depending on the muscle.

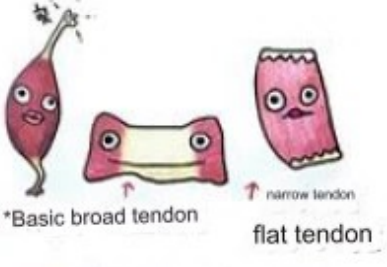
① starting point and ending point

② Direction of muscle contraction

③ Use of muscles



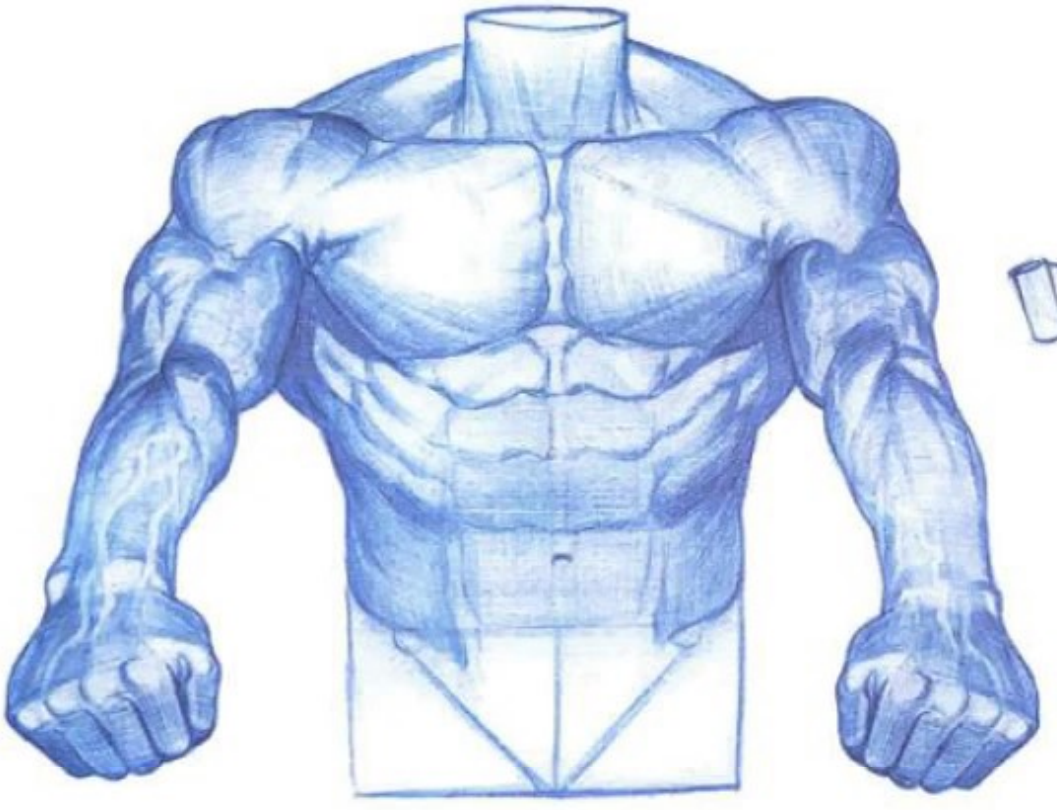
④ Muscles overlapping order

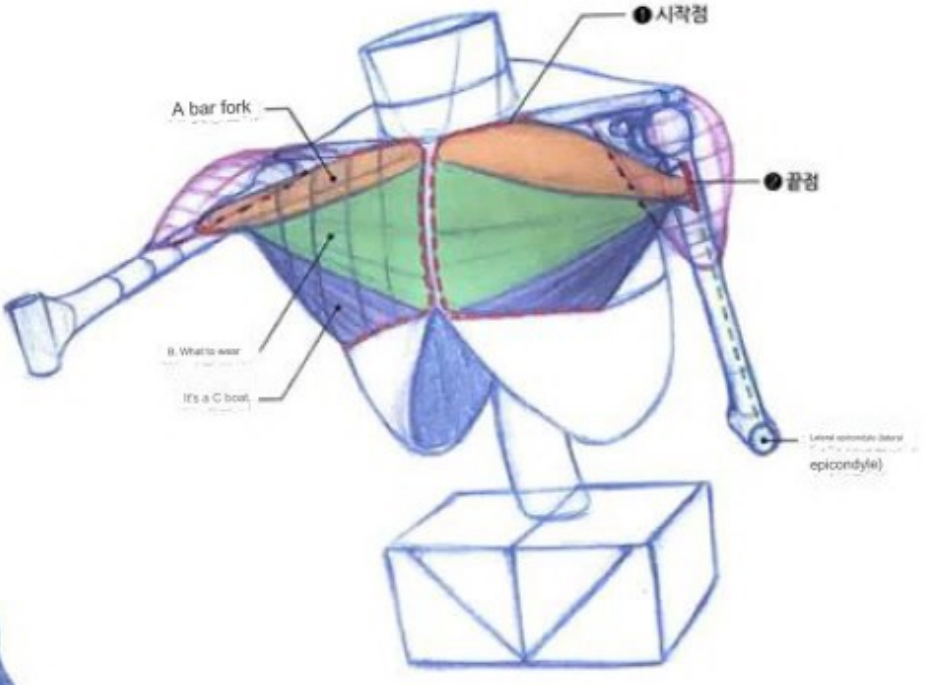


⑤ Ratio of sinew and tendon

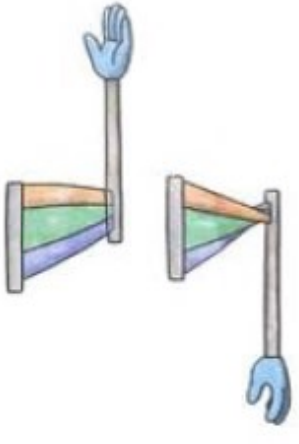
1 Location and use of torso muscles

■ Pectoralis major muscle (Pectoralis major)

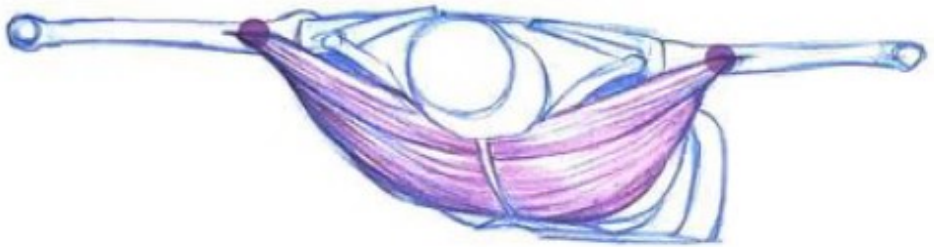


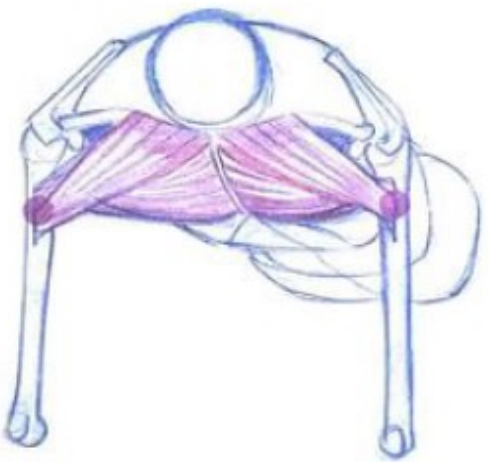


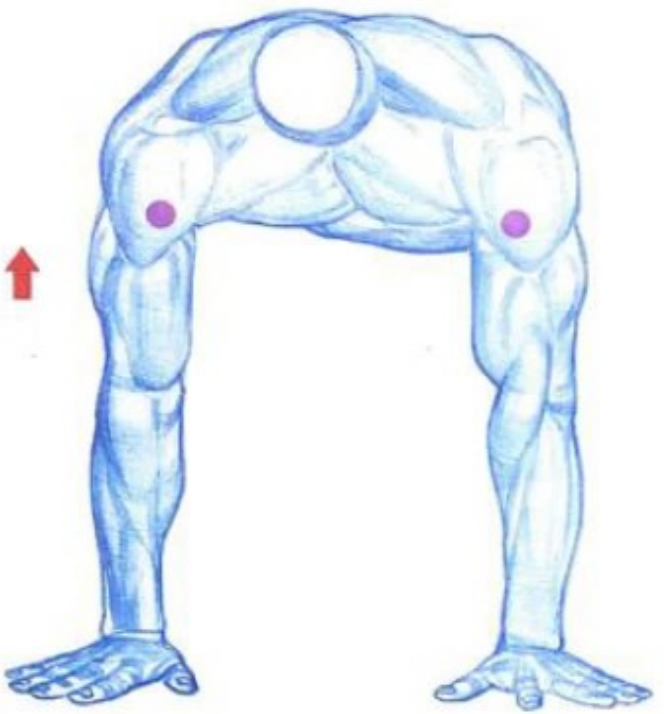
starting point and ending point



The pectoralis major muscle is divided into three branches. The clavicle (A), sartoral fork (B), and ventral fork (C) begin in a U shape and are twisted like a twist and attached to point 2 of the humerus. Point 2 is located at the upper point of the lateral superior articular ridge line, which is the outer side of the protruding parts on both sides of the elbow.

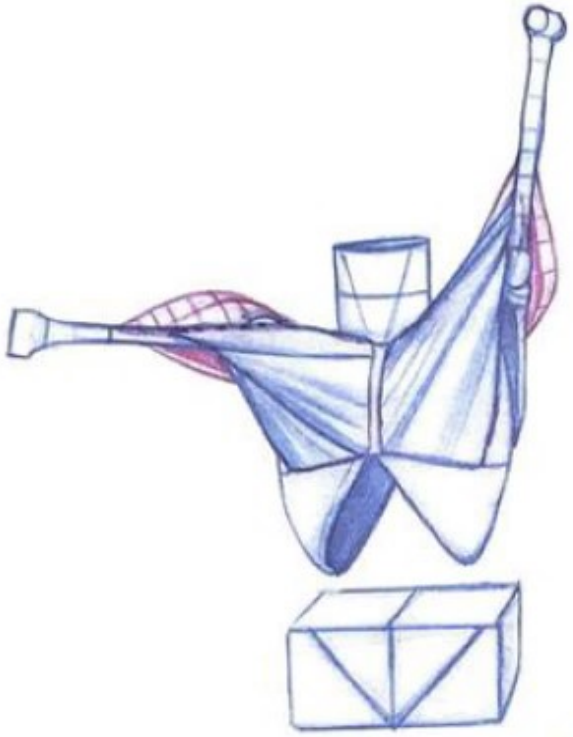


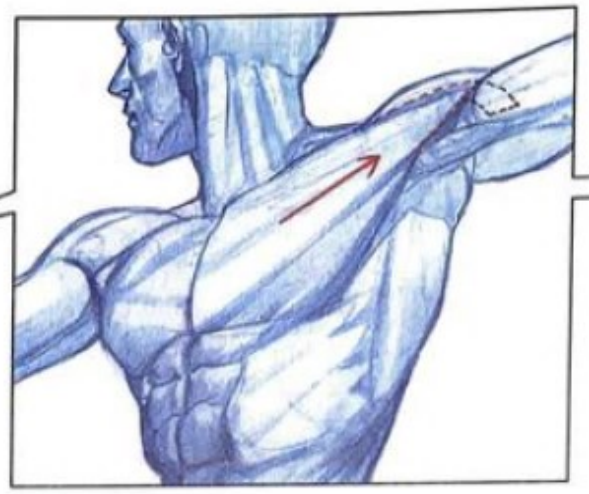




Use

The pectoralis major muscle is used to push your arm forward and to hug something. A simple exercise to develop the pectoralis major muscle is push-ups. The pectoralis major muscle, which is divided into three branches, uses the clavicle muscle to push the arm upward. When pushing the arm forward, the abdominal fork is used, and when pushing the arm downward, the belly prong is used.



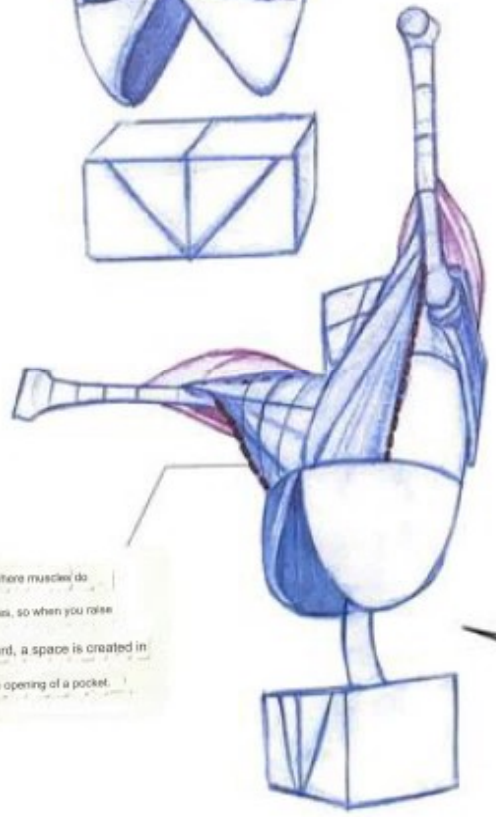


Feature 1

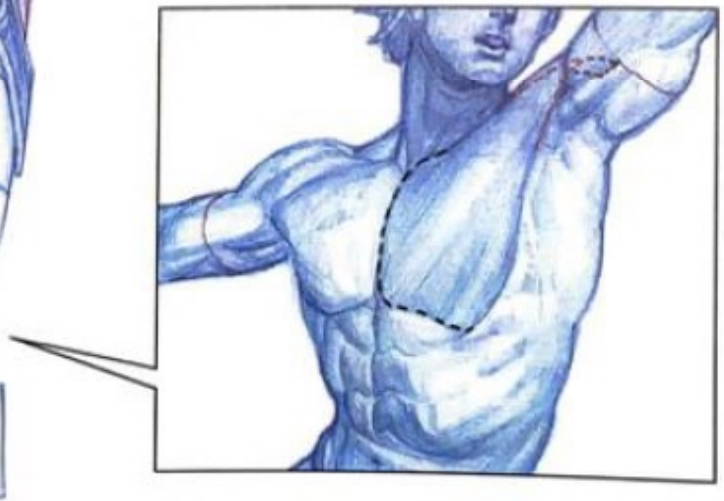
The tendons of the pectoralis major muscle are stretched along the end point.

This is why it is important to know the exact location of the end point.

Observe the change in the shape of the pectoralis major muscle when you raise and lower your arm!



This is an area where muscles do not attach to bones, so when you raise your arm upward, a space is created in the armpit like the opening of a pocket.

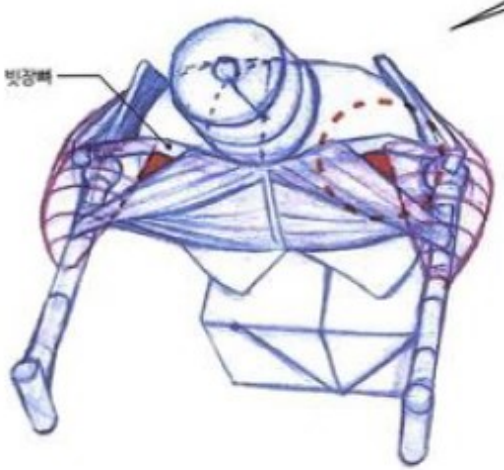


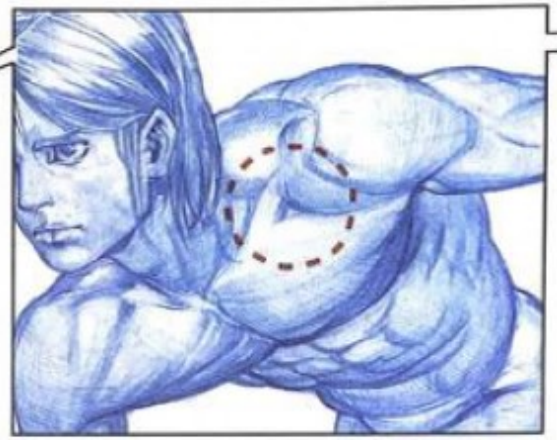
Feature 2

When you raise your arm, the three braids become untangled.

Since the pectoralis major muscle is in a relaxed state, the thickness of the muscle must be expressed thinner than usual.

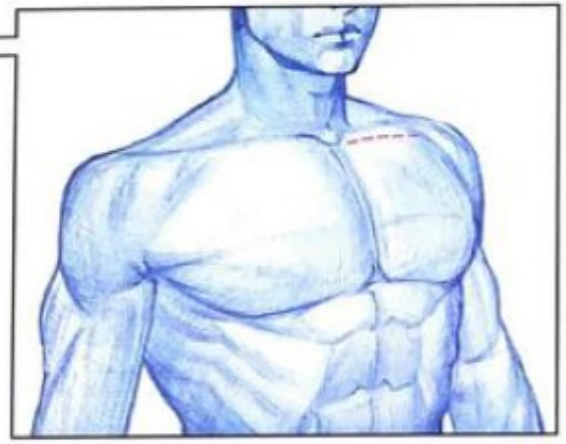
The black dotted line is the area where the pectoralis major muscle is attached to the ribs, and the red dotted line is seen through the flow of the pectoralis major muscle wrapping its arms around the end point.





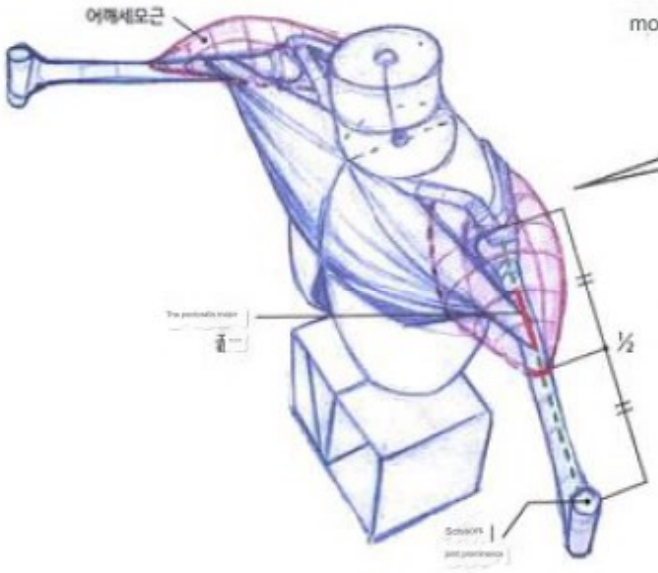
Feature 3

The depressed area below the clavicle is an empty space. As the muscles develop, the concave shape becomes more clearly visible.



Feature 4

The pectoralis major muscle attaches to the underside of the clavicle (clavicle), so when the muscle develops, the shape under the clavicle is not revealed.

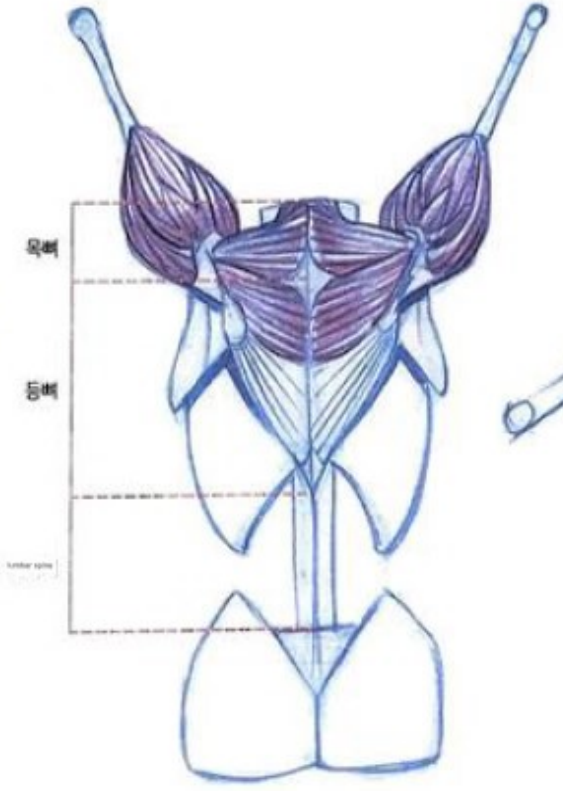


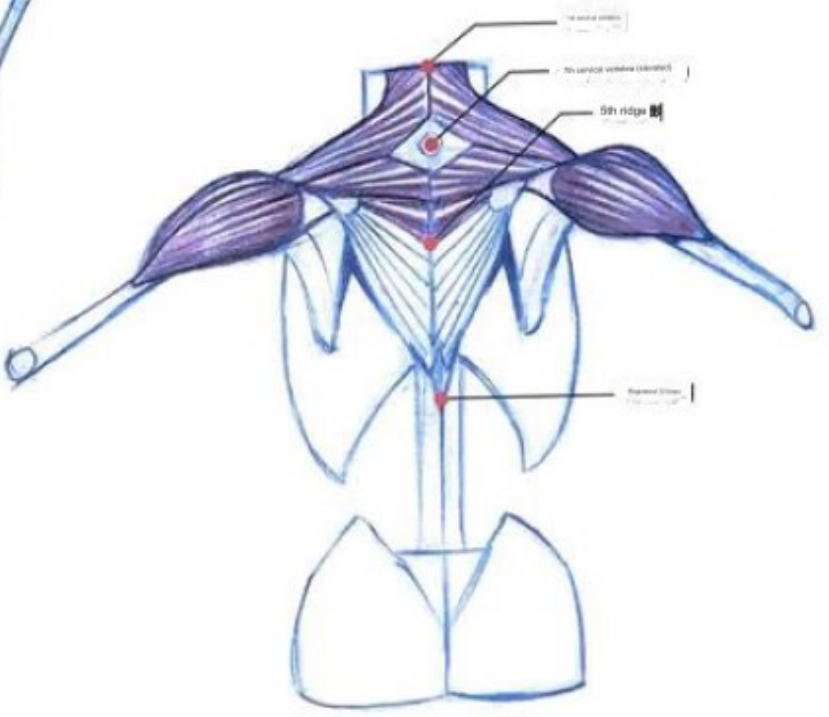
overlapping order

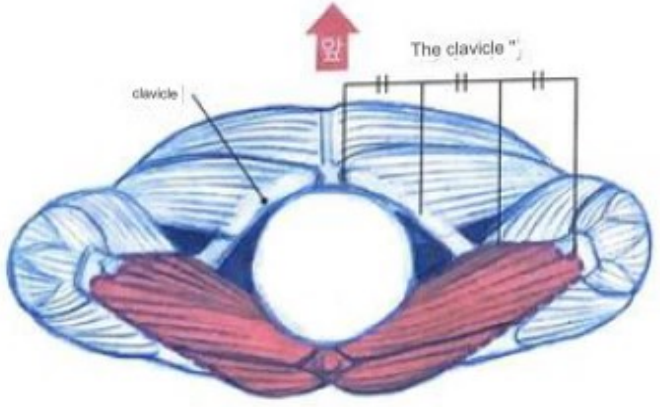
The deltoid muscle covers the end of the pectoralis major muscle.

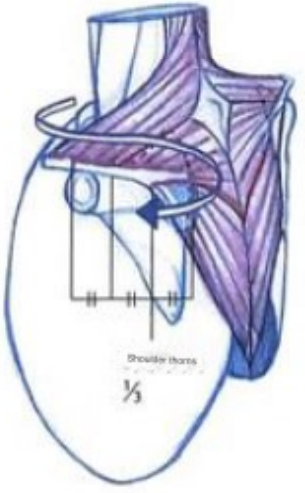
The deltoid muscle is attached to the point on the lateral superior articular eminence line of the humerus.

■ Trapezius muscle, which lifts up





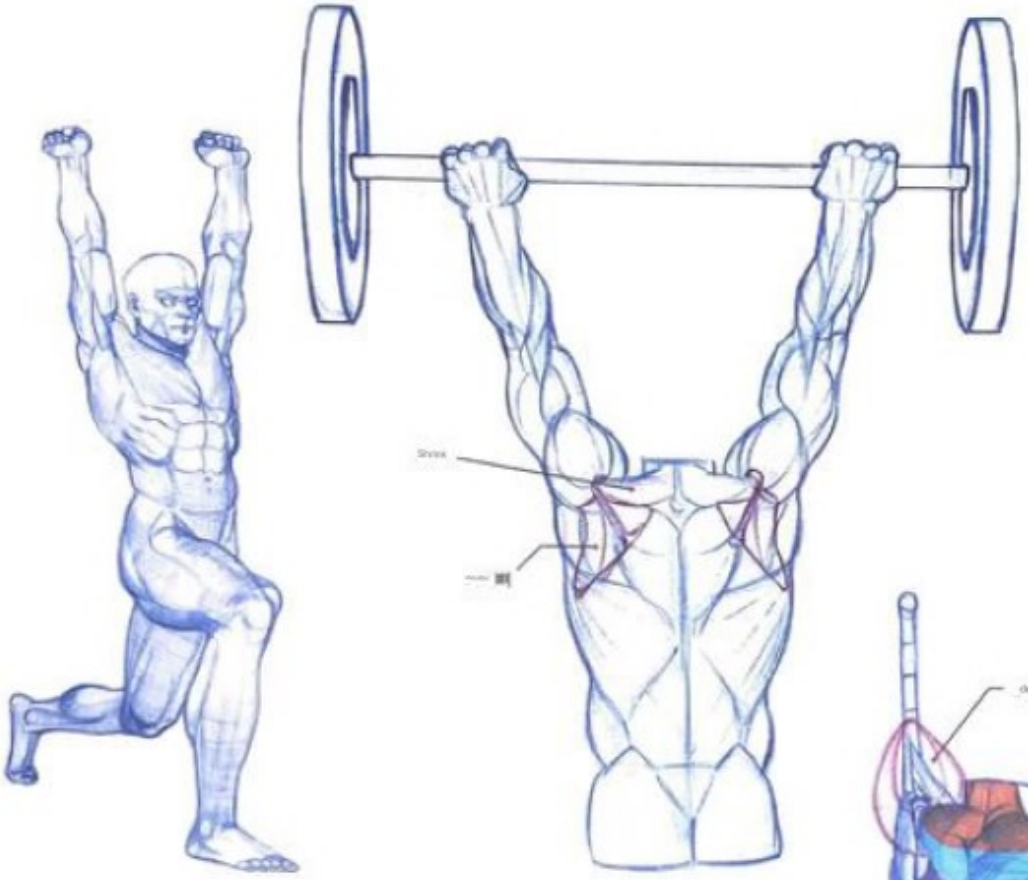


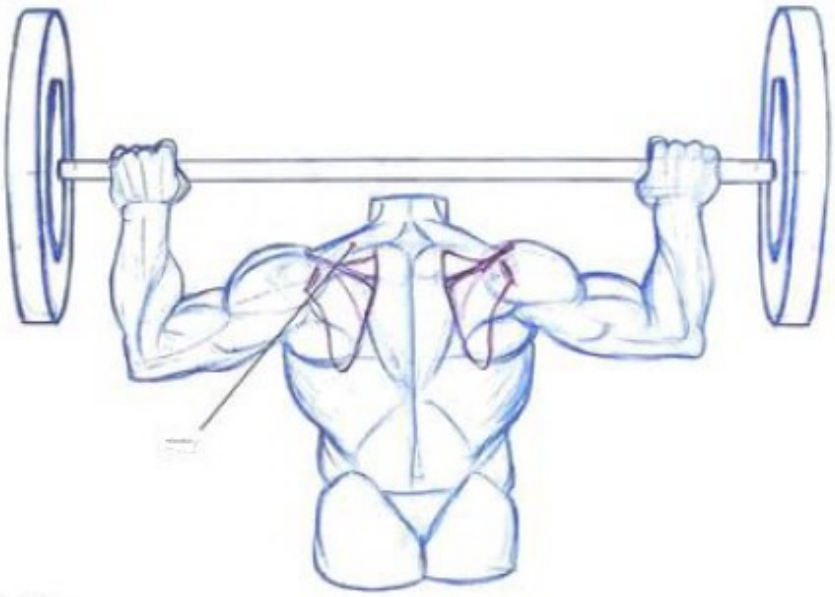


starting point and ending point

The trapezius muscle is an important muscle involved in neck and shoulder movements and is largely divided into upper, middle, and lower parts.

Looking at the starting point, the upper part is from cervical vertebrae 1 to 7, the middle part is from cervical vertebrae 7 to 5 thoracic vertebrae, and the lower part is from vertebrae 5 to 12. The end point starts from the clavicle family point, goes around the upper surface of the scapular spine, and attaches to the lower surface of the scapular spine.

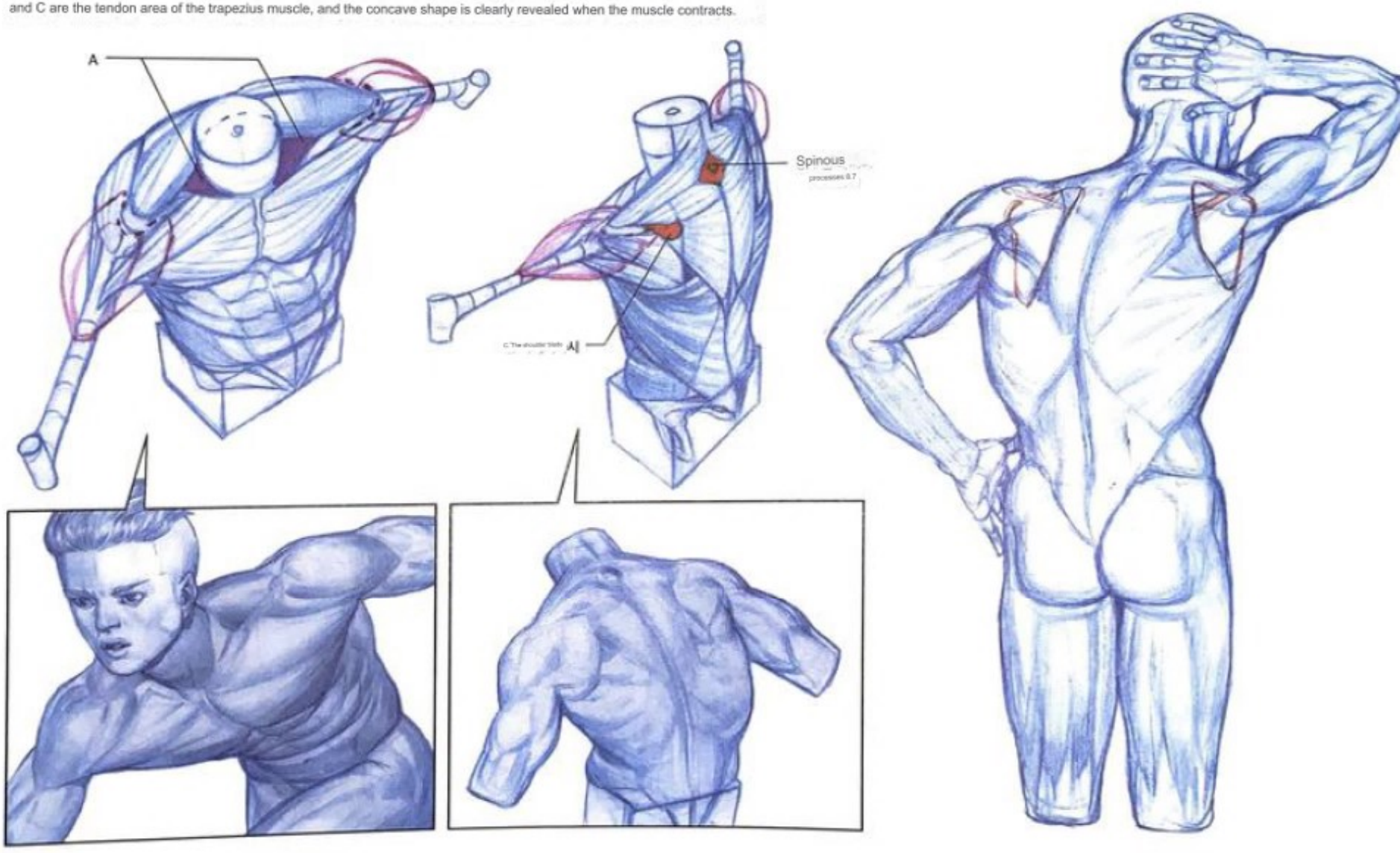




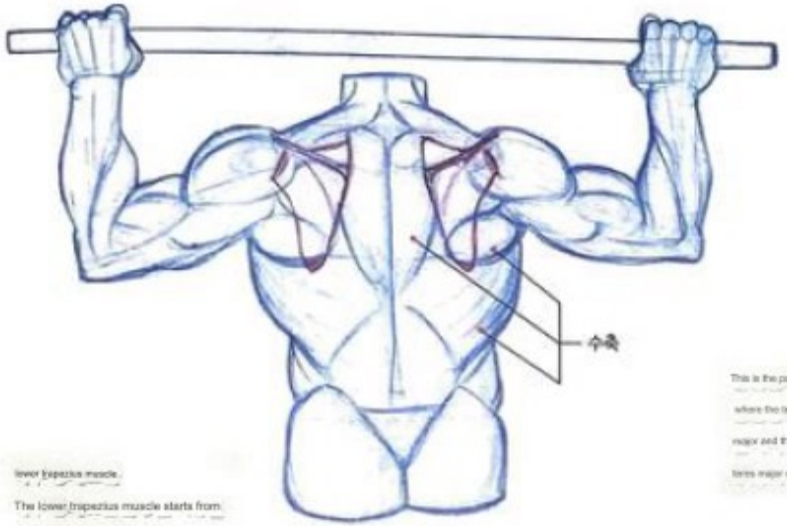
Use

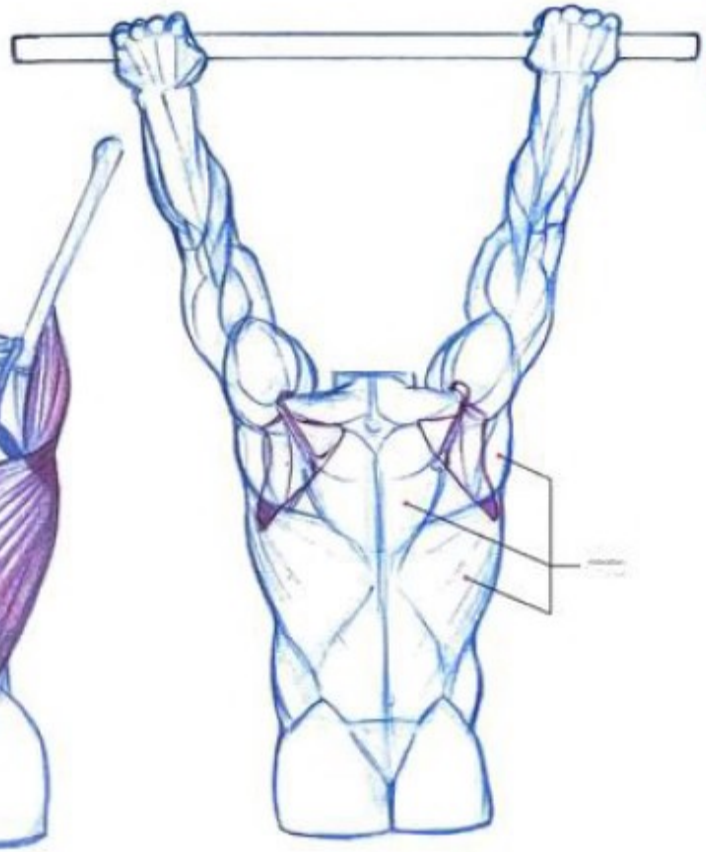
Depending on the movement of the shoulder, the area where force is applied varies. The upper part raises the shoulder blades, the middle part pulls the shoulder blades back, and the lower part lowers the shoulder blades. As shown in the picture above, when lifting a heavy object upward, the upper and middle trapezius muscles are used, and the shoulder trapezius muscles also help.

Please remember that A, the empty space between the upper trapezius muscles, is a part that stands out on the outside. Points B and C are the tendon area of the trapezius muscle, and the concave shape is clearly revealed when the muscle contracts.



■ The broad dorsi (lats), lower trapezius (trapezius), and teres major (teres major) muscles pull downward.

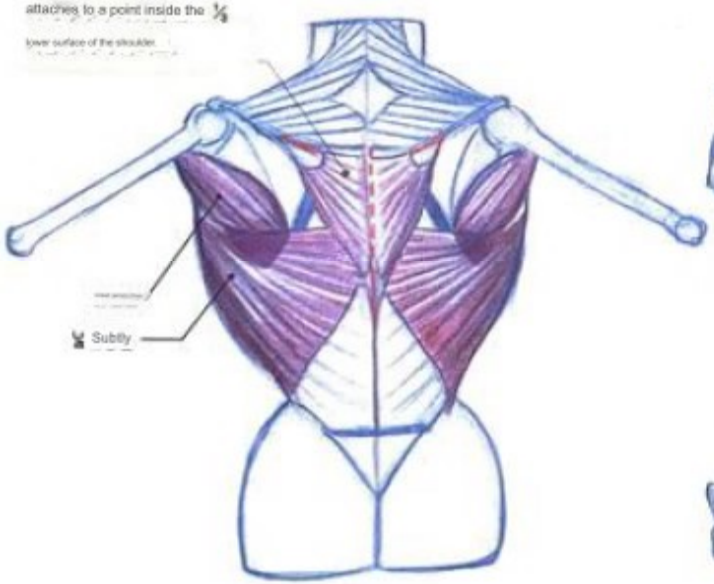




lower trapezius muscle

The lower trapezius muscle starts from the 9th to 12th vertebrae and attaches to a point inside the lower surface of the shoulder.

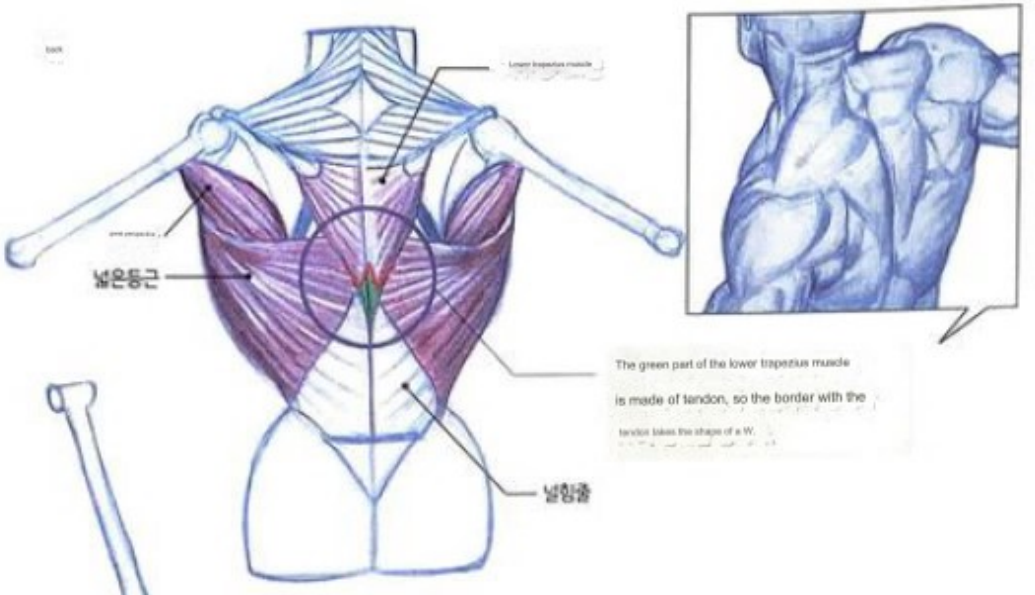
This is the part where the teres major and the teres major overlap.



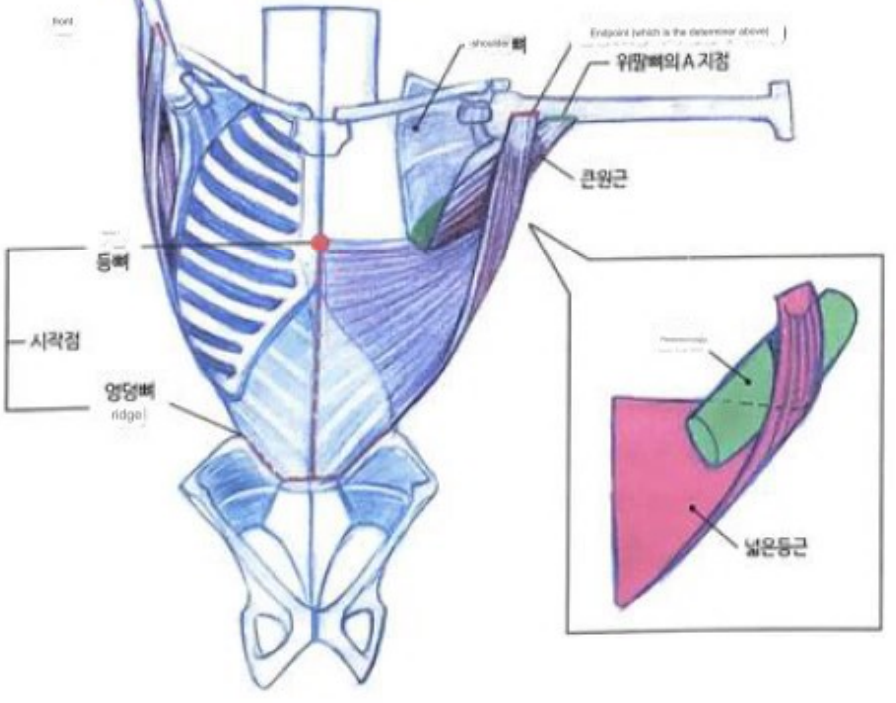
Subtly

Use

The latissimus dorsi is a muscle that was frequently used in the days of tree-climbing apes, so it is still the most widely distributed muscle in our bodies. However, as people began to walk upright, the use of the wide rounded area decreased and it became less visible on the outside. On the other hand, if you continue to do pull-up exercises similar to tree climbing, the development of your muscles will be more noticeable than that of any other muscle. The latissimus dorsi is used to forcefully pull the arm down, and the teres major and lower trapezius muscles play a helping role.



The green part of the lower trapezius muscle is made of tendon, so the border with the tendon takes the shape of a W.

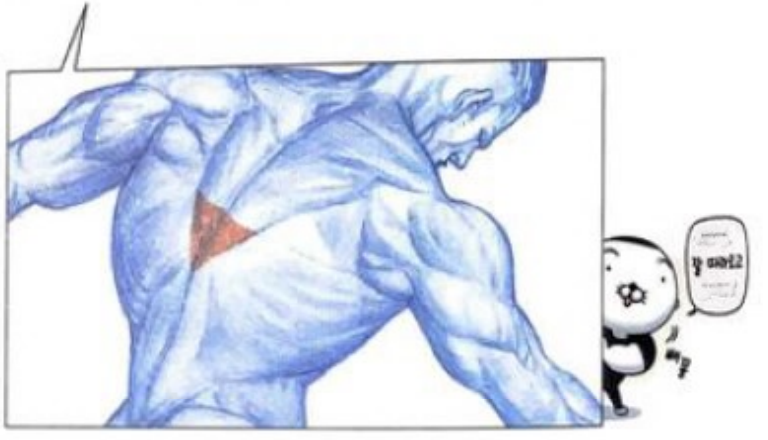


The area of the tendon spread out widely in the broad circle is called a 'tendon'. The area of this tendon appears to be considerably larger than the tendon area of other muscles.

If you know the boundary between tendon fibers and tendon area well, you can accurately express when relaxation and contraction movements occur in the muscle.

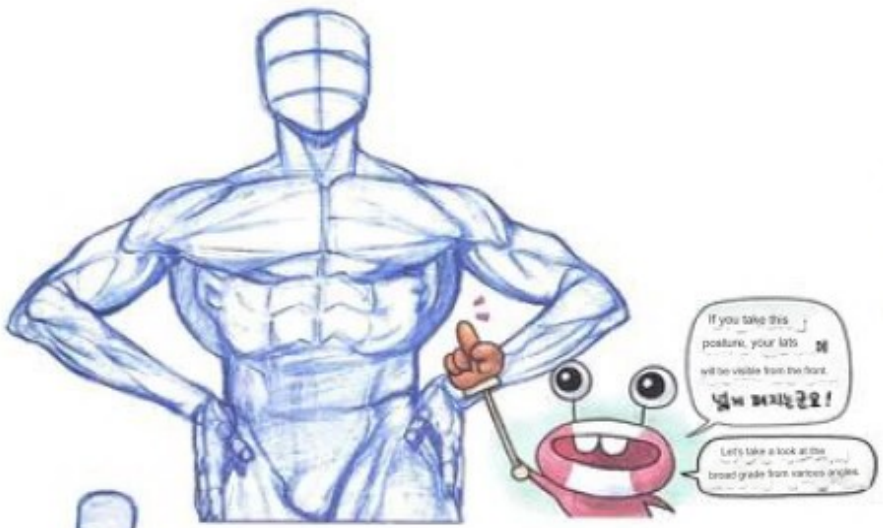
overlapping order

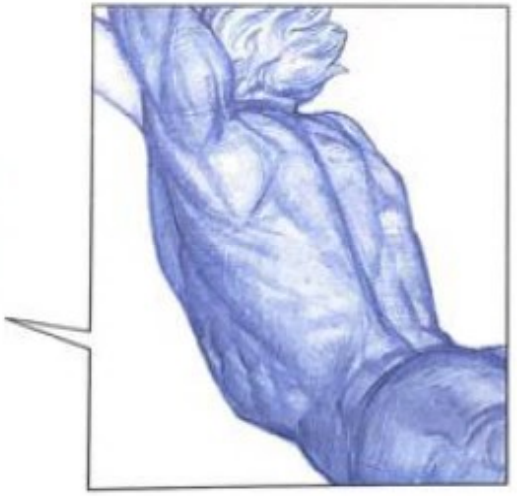
The latissimus dorsi and trapezius muscles overlap from the 7th to the 12th thoracic vertebrae, and the trapezius muscle covers the latissimus dorsum as much as the colored area in the picture below.

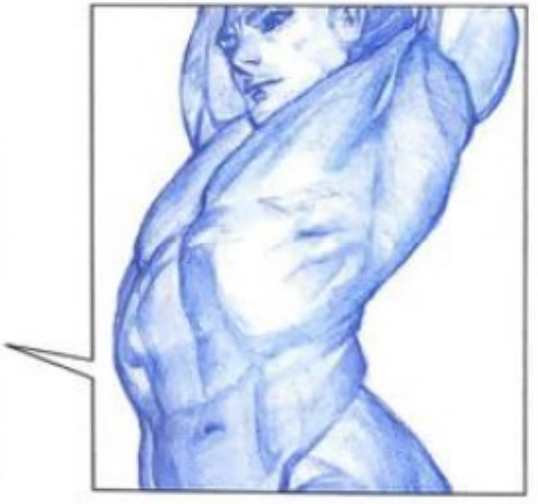


starting point and ending point

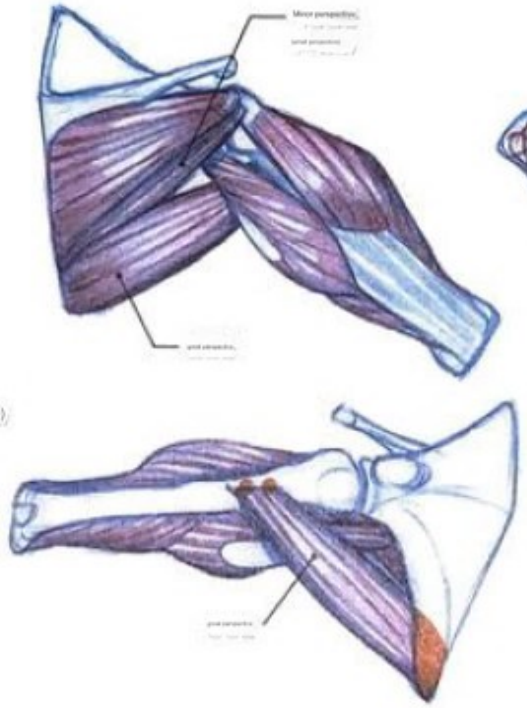
The latissimus dorsi begins at the iliac ridge along the spine from the 7th thoracic vertebra, and ends at the intertubercular sulcus of the humerus. The starting point is wide, and the muscle becomes thinner towards the end point. The teres major extends from below the shoulder blade to point A on the humerus. The teres major overlaps in a way that surrounds the teres major. We will study greater perspective in more detail later.

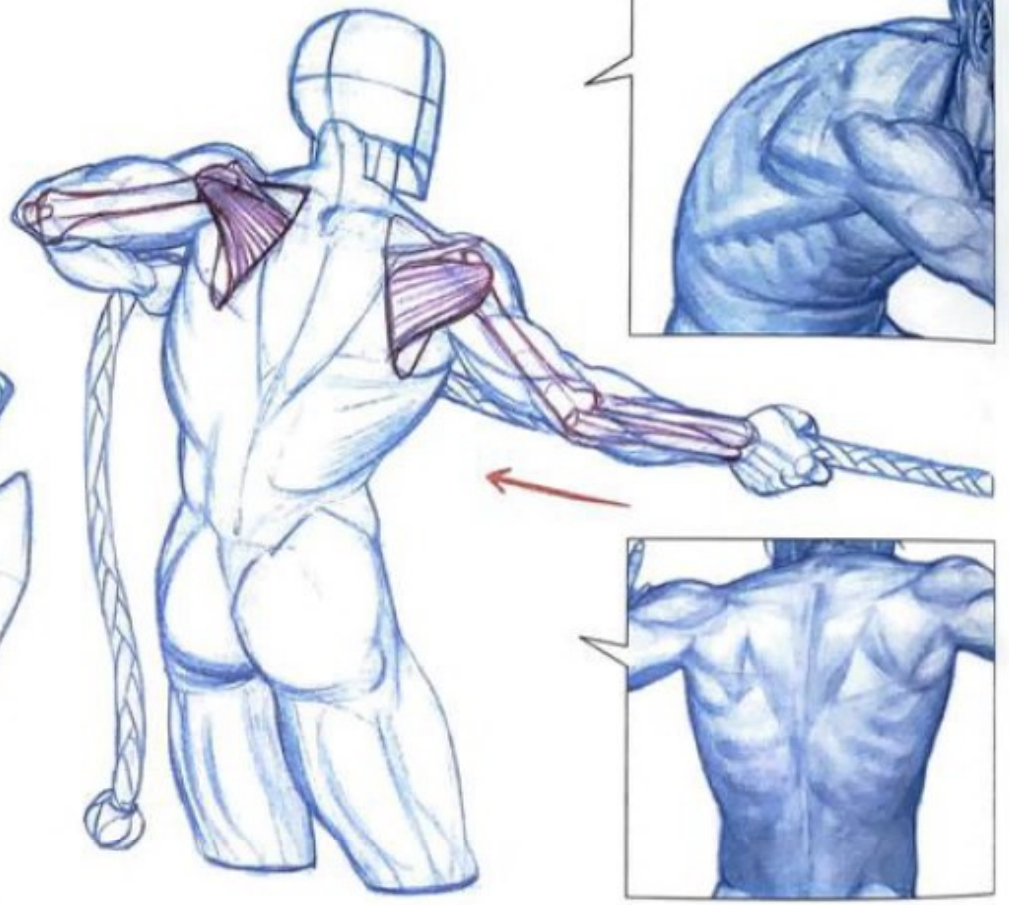

If you take this posture, your lats will be visible from the front.
넓배 퍼지는군요!
Let's take a look at the broad grade from various angles.





■Infraspinatus (infraspinatus) and teres major (teres major) muscles that help with pulling





Since the teres minor is not visible from the outside,

it will be expressed together with the infraspinatus

muscle from the later chapters.

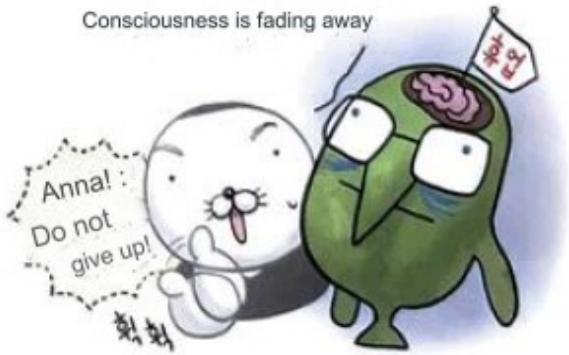
starting point and ending point

The purple area is the starting point where the infraspinatus muscle attaches to the shoulder blade and the end point where it touches the head of the humerus, and

the red area is the starting point where the teres major muscle attaches to the bottom of the shoulder blade and the end point where it touches the front of the arm of the humerus bone.

Use

The infraspinatus and teres major muscles pull the arm back to pull something.



overlapping order

The deltoid muscle covers most of the area where the infraspinatus and teres major muscles are intertwined, so the complex structure is not clearly visible on the outside. However, it is an area that must be studied in order to understand the operating principles of movement. This part becomes more

, so we will cover it in detail later.

■ Rhomboids (rhomboids) that raise the shoulders

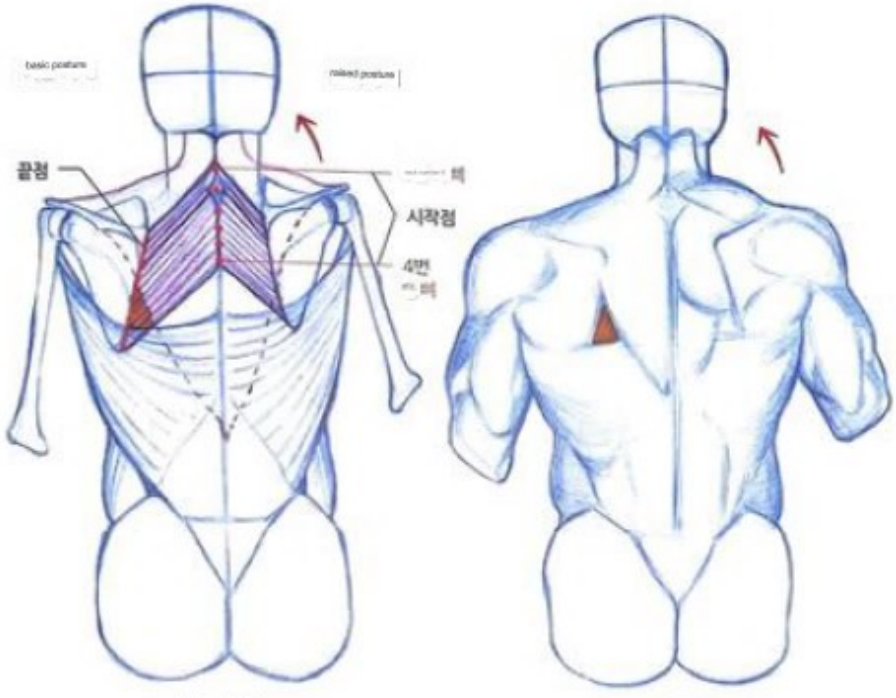


Figure 1-1

Figure 1-2

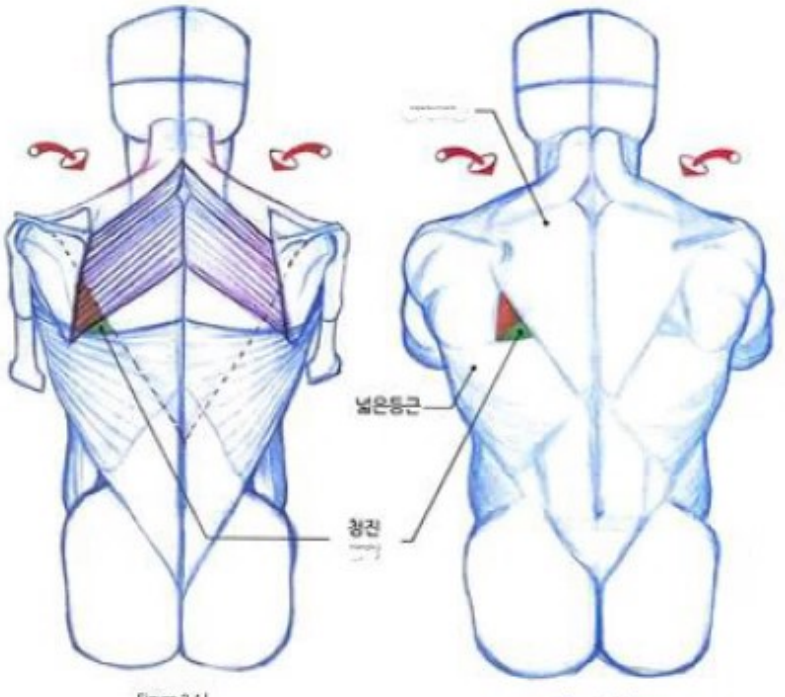


Figure 2-1

Figure 2-2

starting point and ending point

The rhomboid muscle is shown in Figure 1-1.

Starting from the 6th cervical vertebra

Past the 4th vertebra

inside of the shoulder blade

It reaches the corner.

Use

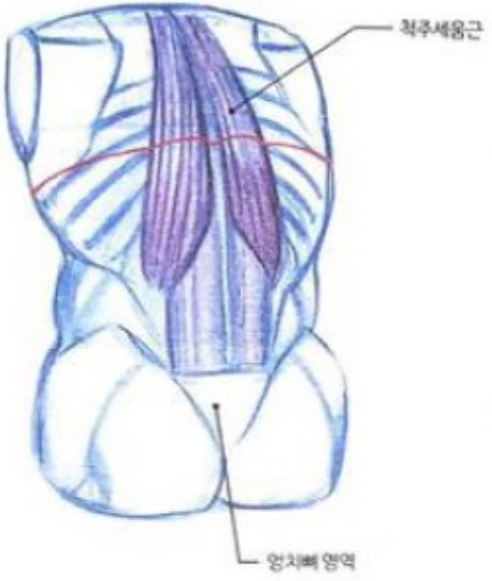
The medius muscle acts to raise the shoulder by pulling it toward the back. You can observe the external appearance of the rhomboid muscles when they are contracted through Figure 1-2. If you push your shoulders forward as much as possible, the most relaxed posture for the rhomboid muscles is created, and you can see from Figures 2-1 and 2-2 that unlike when they are contracted, they do not affect the appearance.

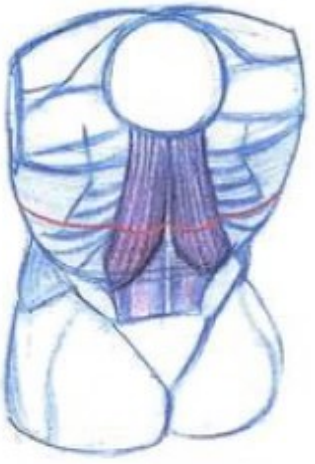
Order of kimchi

The rhomboids are largely obscured by the trapezius and latissimus dorsi (except for the triangular auscultation portion).

The auscultation triangle is the part where the stethoscope is applied, so it is named 'auscultation triangle'. This is the area that widens when the shoulder is pushed forward, as shown in Figure 2-1 and 2-2.

■ The erector spinae muscles that support the lower back





starting point and ending point

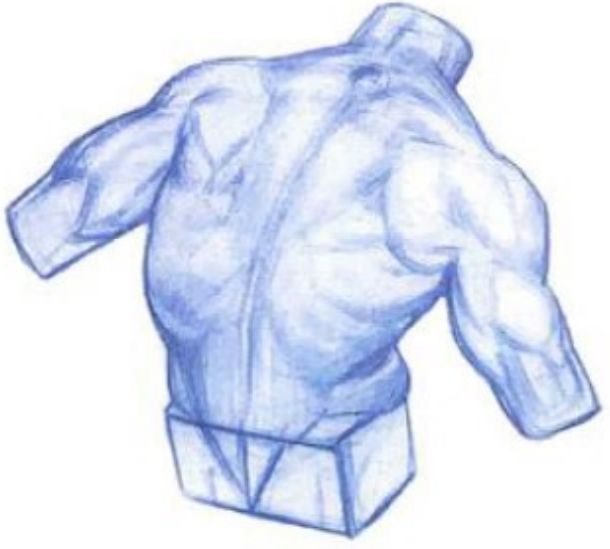
The spinosus, longus maximus, and iliac intercostal muscles are collectively called the erector spinae muscles. The picture on the left is a simplification of these muscles by combining them into one lump. Please note that for ease of understanding, the shape of the muscle is expressed differently from the actual muscle. The erector spinae muscle extends along the spine from the bottom of the skull to the sacrum.

Use

Used to bend your back backwards and support your posture.

overlapping order

It is located in the deepest layer of the back muscles and is directly connected to the bone.



The volume of the erector spinae muscle becomes thinner as you go above the midline, where the spinal processes are located. Additionally, as the erector spinae muscles develop, the muscles protrude in an 11 shape from the center line of the back toward the sacrum. When you bend forward at the waist, the erector spinae muscles relax, so the thickness of the tendons becomes thinner and the spinal processes become more prominent.

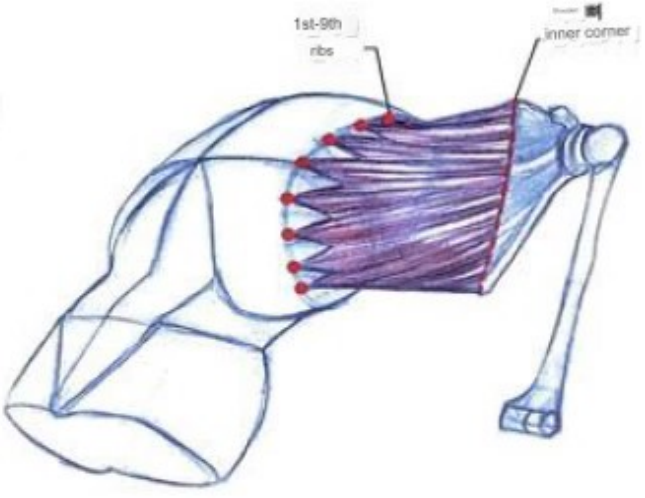
■ Serratus anterior muscle, which pushes the shoulder forward

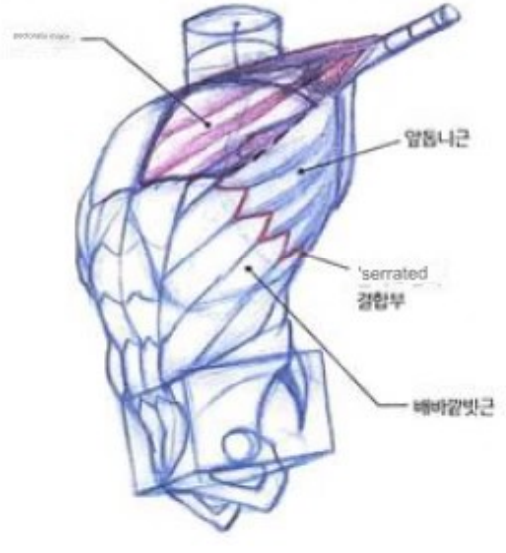
starting point and ending point

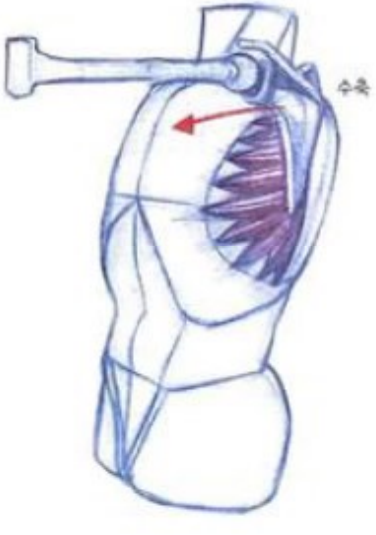
The serratus anterior muscle attaches to the 1st through 9th ribs and connects to the inner edge of the shoulder blade. It looks as if the hand is covering the chest cage.

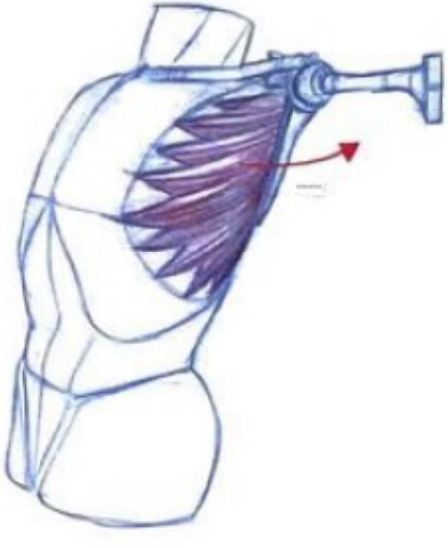
overlapping order

The pectoralis major muscle covers the stomach and also covers the 4th to 5th branches of the serratus anterior muscle. The serrated joint that engages the external oblique muscle stands out when the arm is raised.



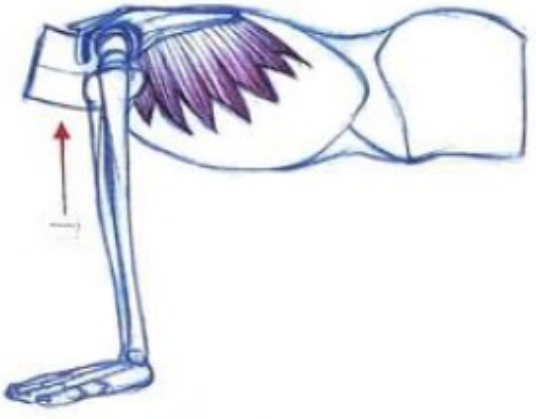


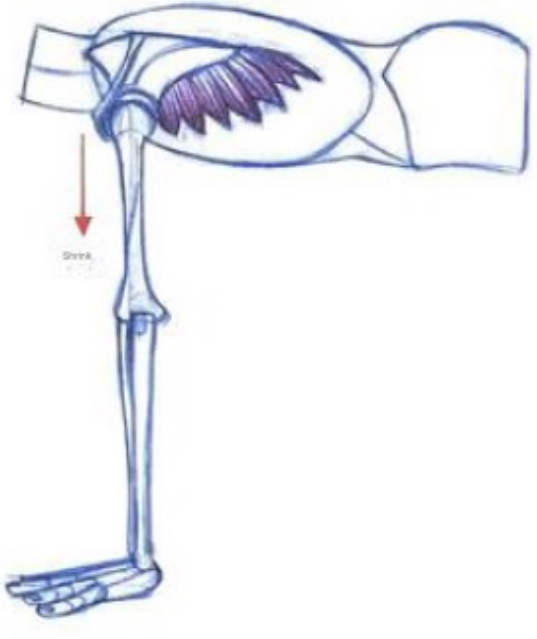




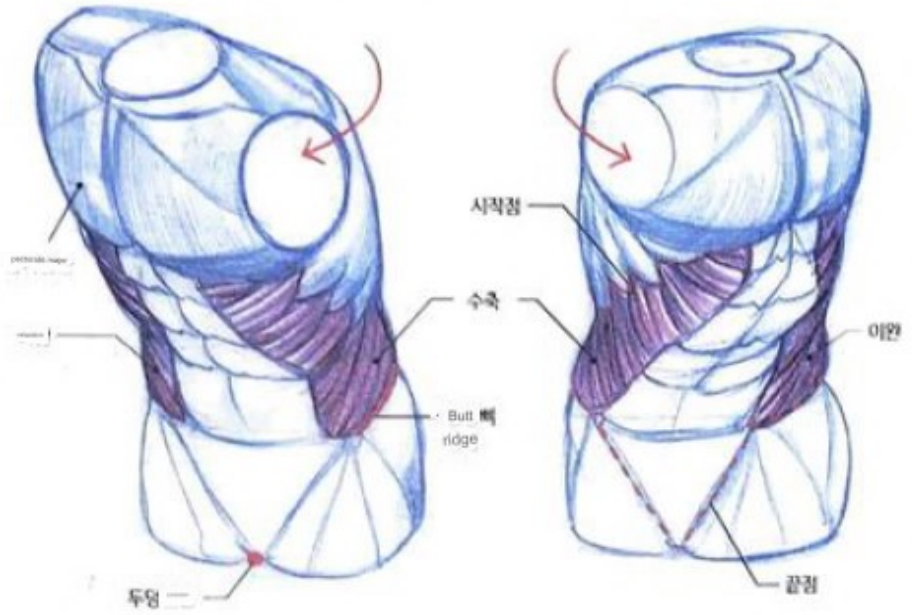
Use

The serratus anterior muscle is used to hold something or push the shoulder forward.





■ External oblique muscle, which twists the waist



starting point and ending point

The external oblique muscle has eight branches that start from the 5th to 12th ribs and extend along the iliac ridge to the point of the calvaria junction.

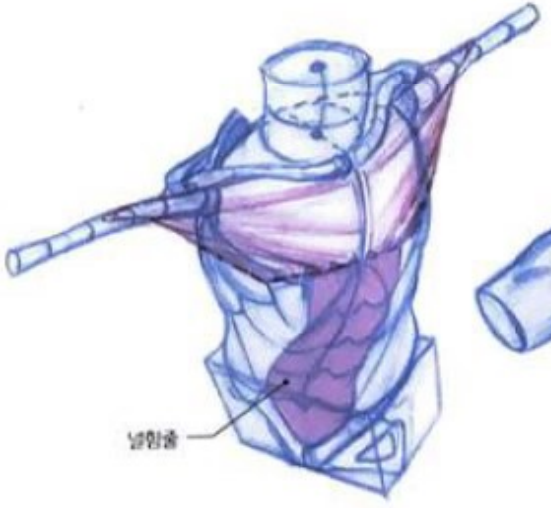
Use

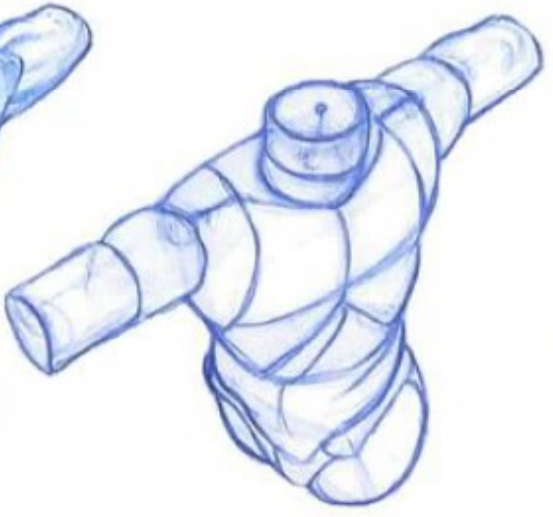
This part is used when bending the upper body forward or twisting the torso. In the chest, ribs protect organs, but in the abdomen, there are only spines for waist movement and no ribs, making it vulnerable to external shocks. So, instead of bones, a large area of tendon called 'strength' plays the role of protecting the internal organs of the abdomen.

overlapping order

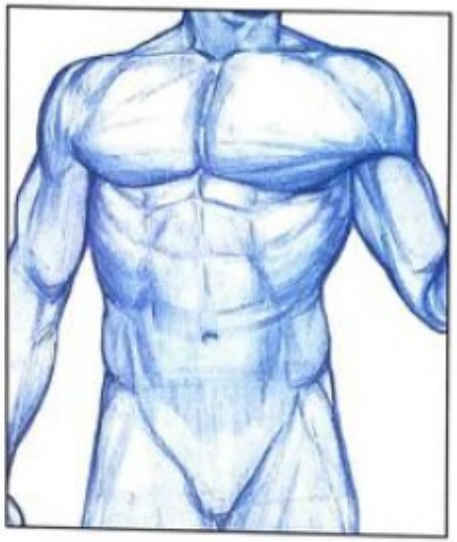
The tendon of the external oblique muscle overlies the rectus abdominis muscle shown on the right page.

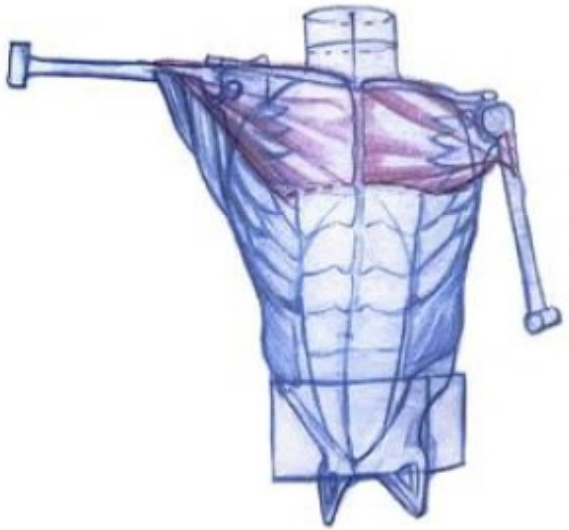
The tendon fibers of the serratus anterior and external oblique muscles become steeper as they go down.

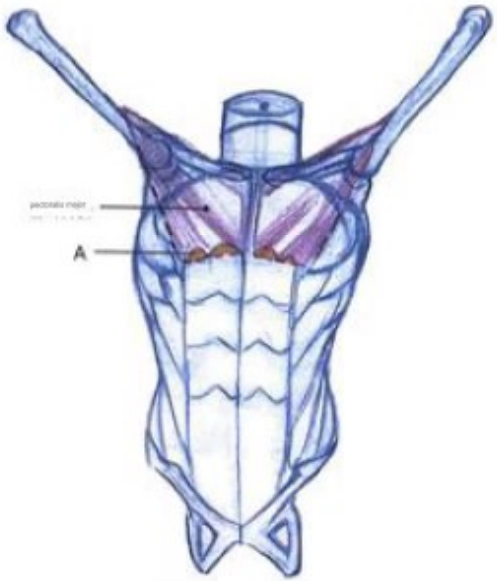




■ Rectus abdominis muscle that bends the waist







starting point and ending point

It attaches to the inside of the 5th rib and extends to the cephalic union.

Use

When the torso bends forward, the rectus abdominis muscles contract,

and when the torso leans back, the rectus abdominis muscles relax.

overlapping order

The pectoralis major muscle slightly covers A, near the origin of the rectus abdominis muscle, and

the tendon of the external oblique muscle covers the top of the rectus abdominis muscle.

■ Skin-covered male torso flow.

If you have learned proportion and center of gravity through the diagramming stage, try drawing a picture by applying the muscle flow learned in anatomy. It takes a lot of practice, so the most important thing is to practice consistently without rushing.

■ Women's breasts

Figure 1

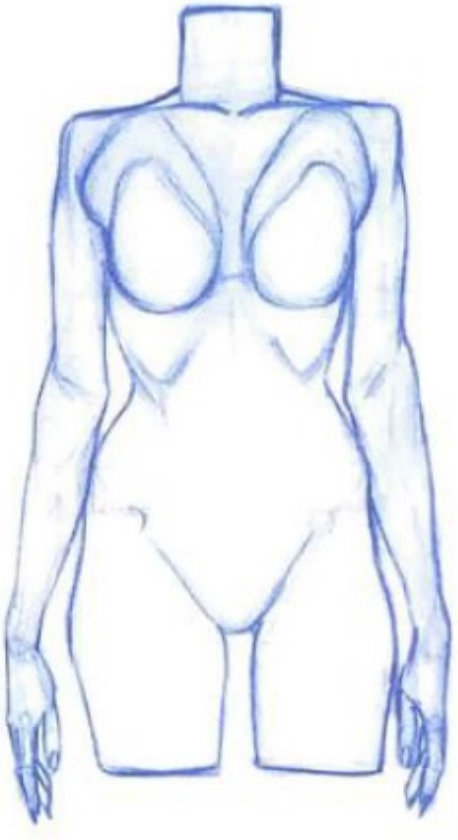
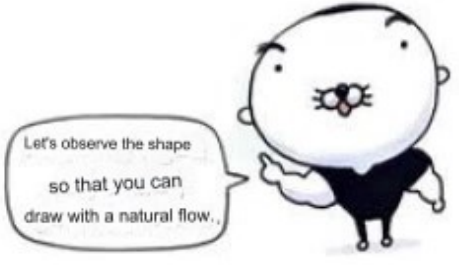
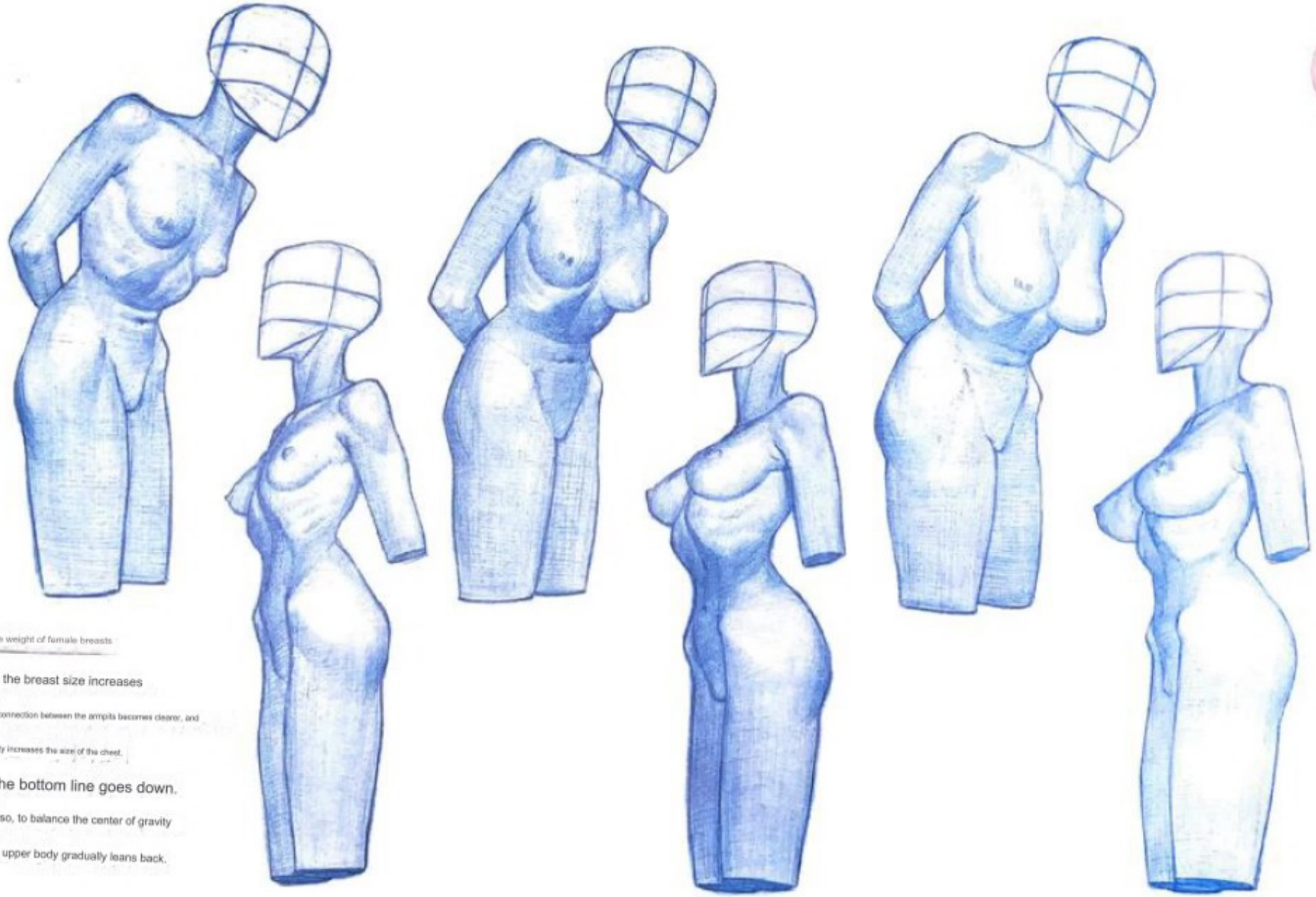


Figure 2

A woman's pectoralis major muscle is located in the same place as a man's, but it is so thin that it is barely visible, and its shape is hidden as the breast made of fatty tissue is placed on top of it. Therefore, the area occupied by the breast and the area of the pectoralis major muscle are often viewed as the same. In reality, the breast area extends lower than the pectoralis major muscle, as shown in Figure 1. Depending on the posture or movement, the breasts change in shape as they are pulled, pressed, or tilted toward the direction of movement. The important thing to note is that the breasts are fixed as shown by the red dotted lines in Figure 1. If you look at it from a morphological perspective as shown in Figure 2, you can control the flow by dividing the chest area into two.





The weight of female breasts

As the breast size increases

The connection between the armpits becomes clearer, and

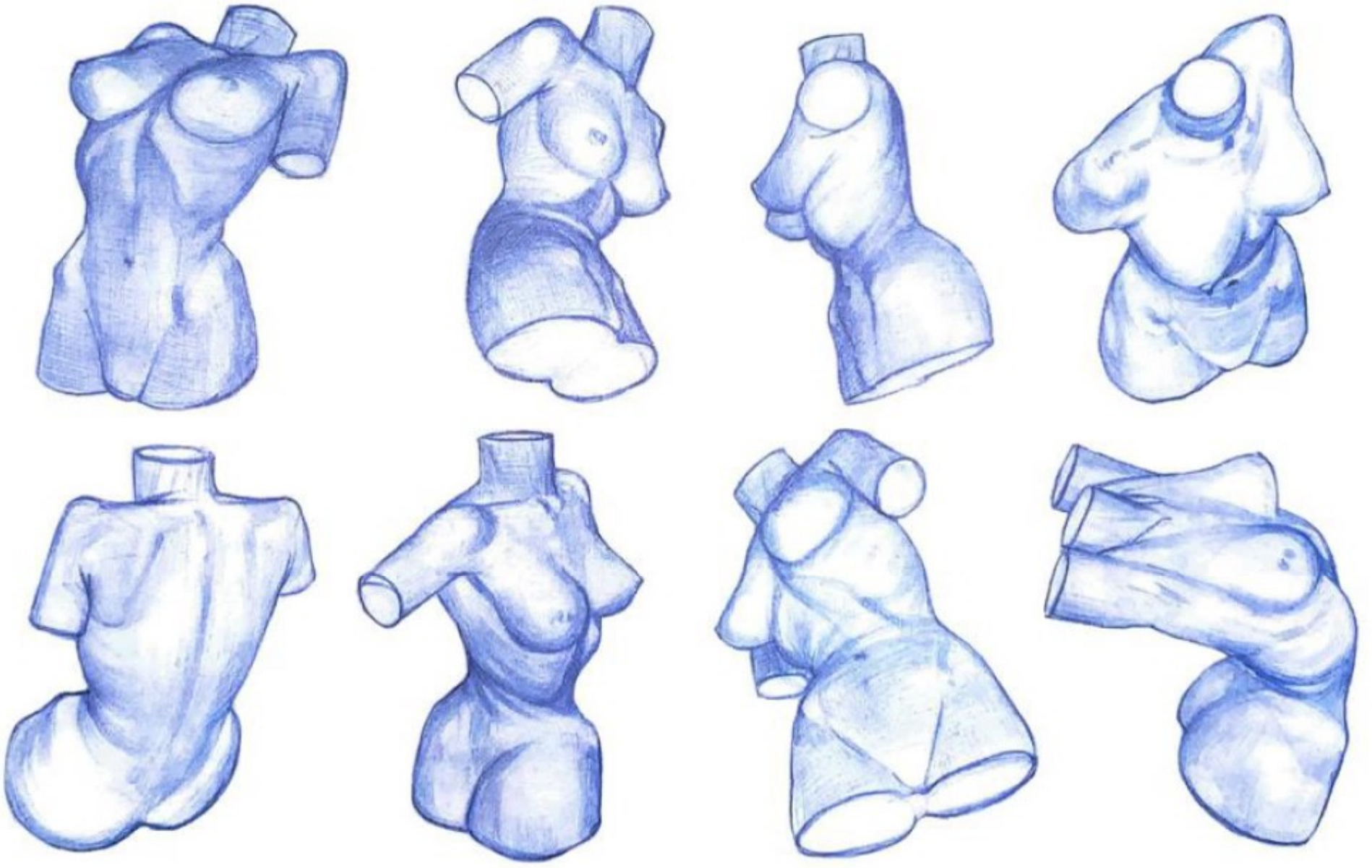
gravity increases the size of the chest.

The bottom line goes down.

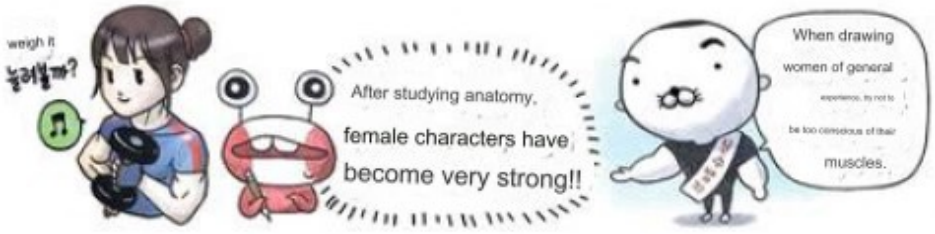
Also, to balance the center of gravity

The upper body gradually leans back.

■ Skin-covered female torso flow.



Women's muscles are thinner and less elastic than men's, so there are many areas where the shape of the bones is exposed. You can see in the picture that the clavicle, shoulder blades, and rib lines appear more prominently than men's. On the other hand, in the pelvic and chest areas, a layer of fat formed under the influence of female hormones obscures the shape of the bones, creating a curved flow unique to women.



2 Location and use of arm muscles

- The overall flow and names of the arms

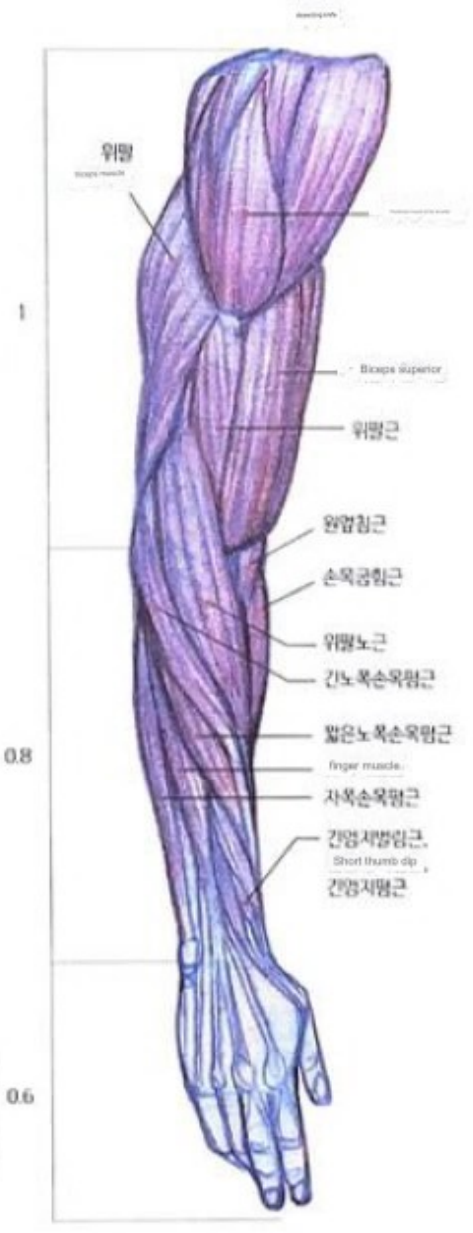
Names and locations of arm muscles

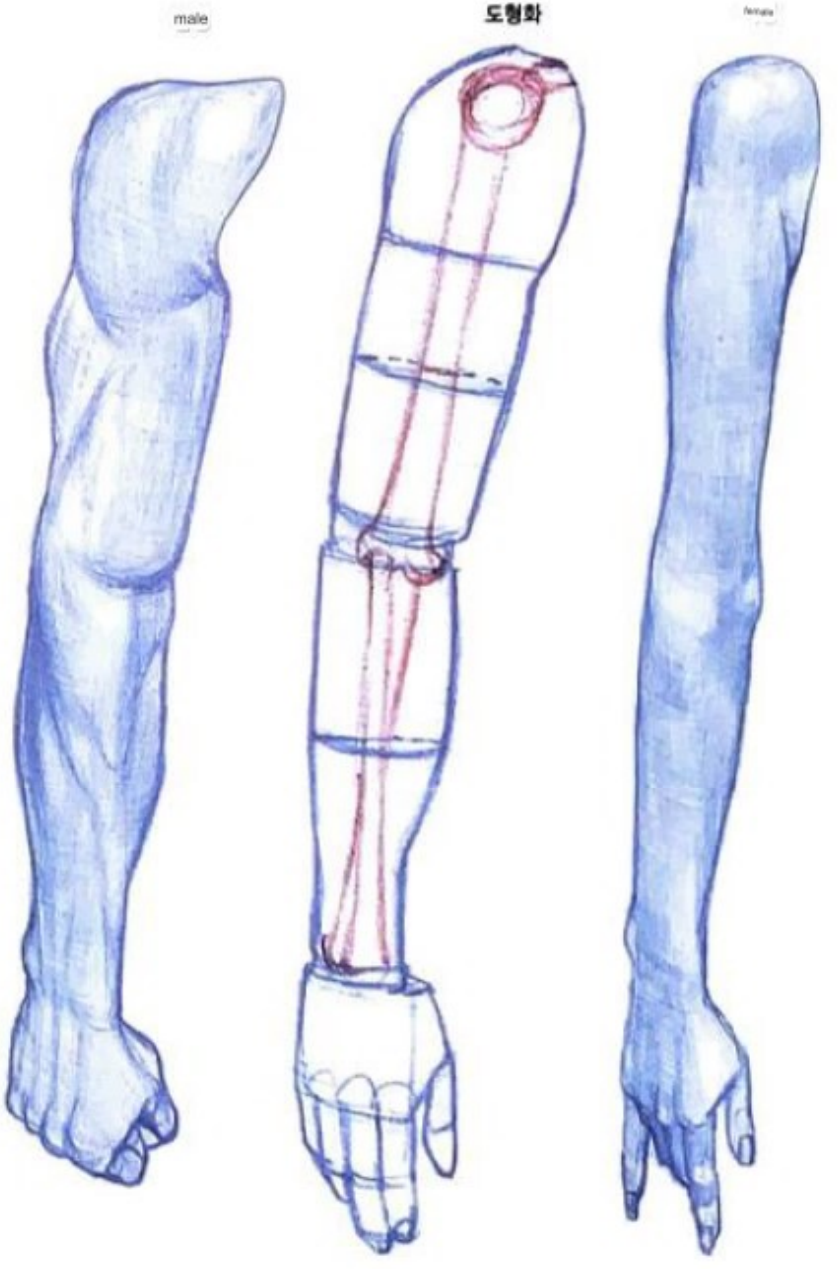
Shall we find out?

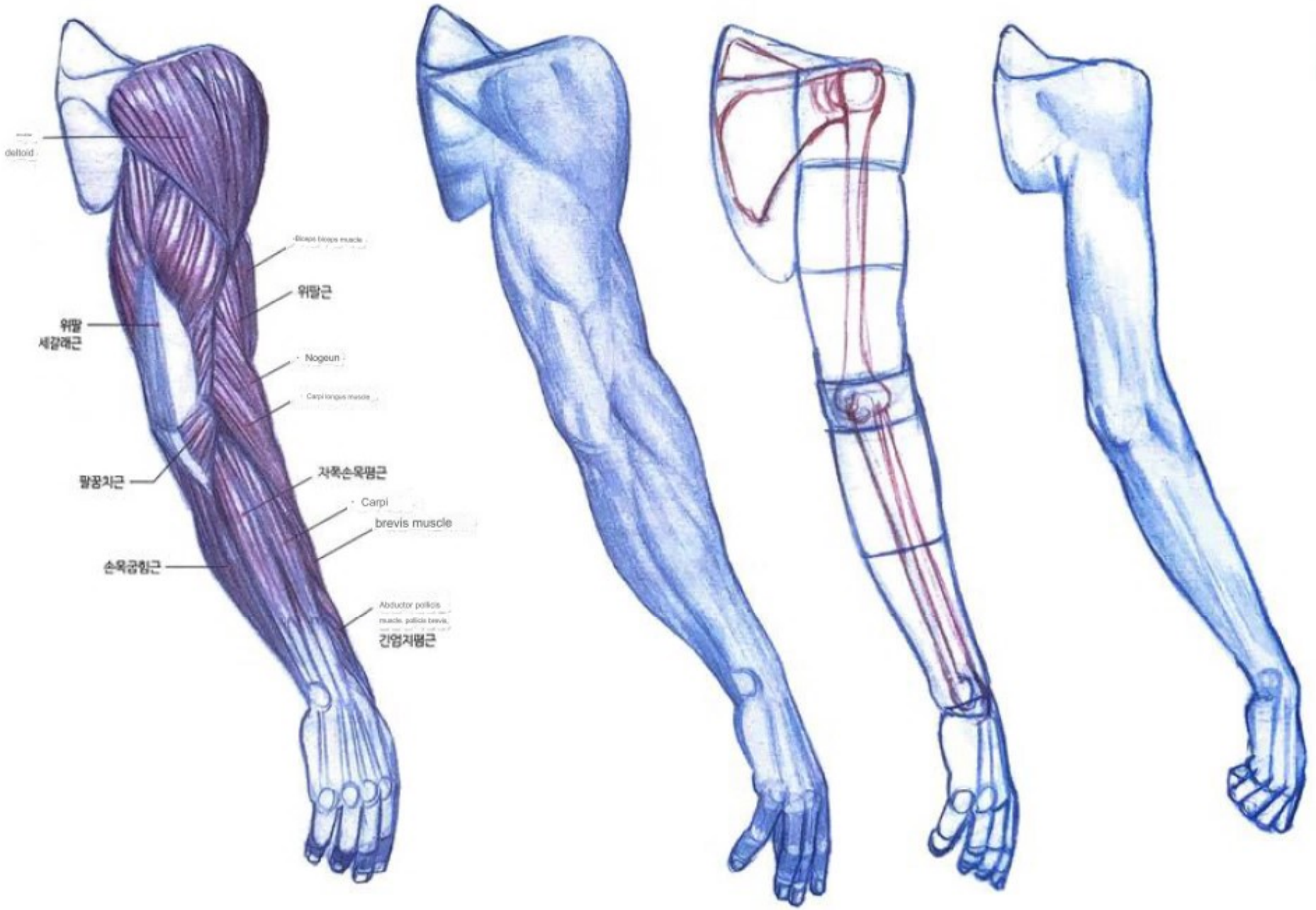
Anatomical appearance and reality

Comparing the external appearance

Observe!






deltoid
위팔
세갈래근
Nogeun
팔꿈치근
자쪽손목폄근
Carpi
brevis muscle
손목굽힘근
간엄지폄근

■ The deltoid muscle, which raises the arm

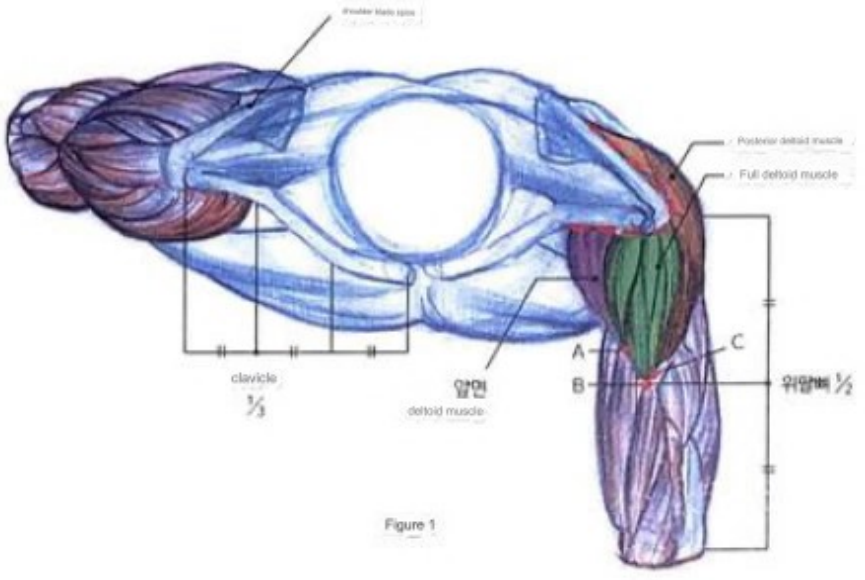


Figure 1

starting point and ending point

The deltoid muscle begins at the family points of the clavicle and the scapular spine, and ends at B, the position of the humerus. The deltoid muscle is largely divided into three branches: front, side, and back. The anterior deltoid muscle does not reach the end point B, and merges with the lateral deltoid muscle as if it disappears at point A. C, the end point of the posterior deltoid muscle, is almost identical to the location of B, the end point of the lateral deltoid muscle.

Tilt of the clavicle and scapula spine

Comparing the position and appearance of the muscle back and forth, as shown in Figure 2, helps to understand the structure and connections of the muscle three-dimensionally. When viewed from the front, the deltoid muscle is connected to the clavicle so that its upper surface is horizontal, and from the back, it bends diagonally downward following the slope of the spine of the scapula.

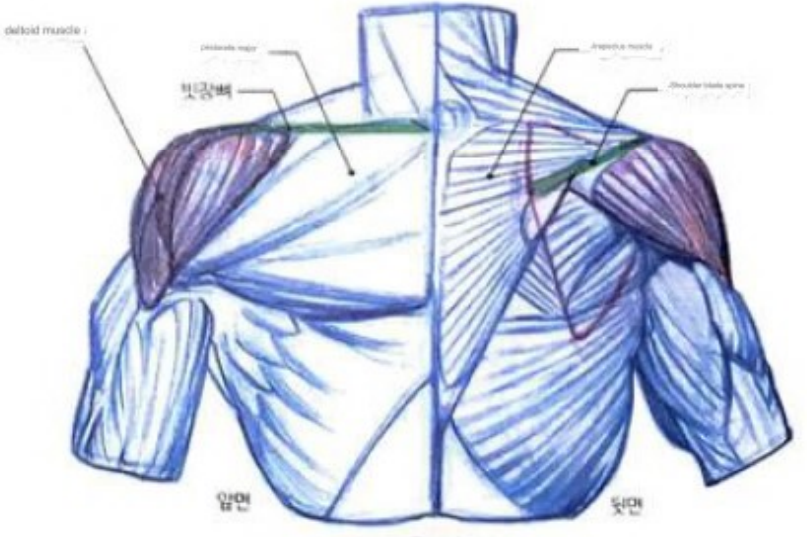
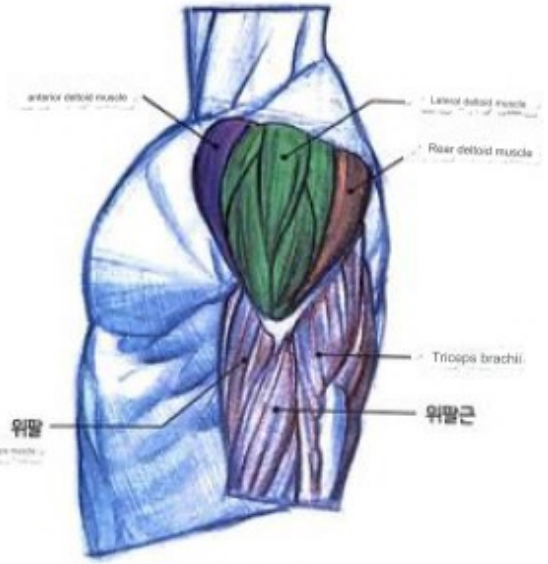
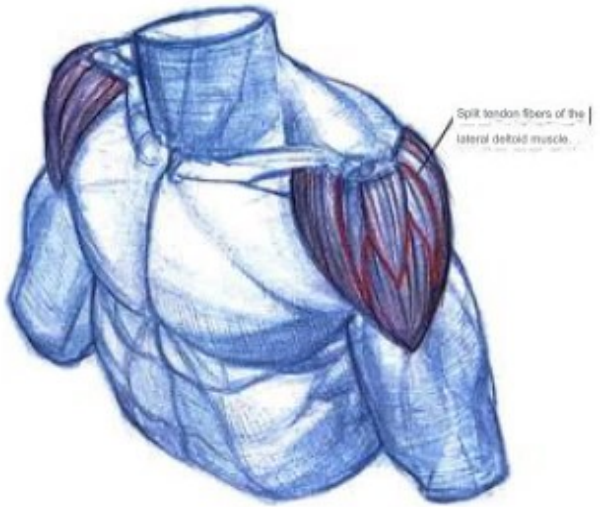


Figure 2





Use

The deltoid muscle plays the role of lifting the arm around the shoulder. The front deltoid muscles lift the arms forward, the side deltoid muscles lift the arms to the side, and the rear deltoid muscles lift the arms backward.

overlapping order

The deltoid scapula is the uppermost among the pectoralis major, biceps brachii, biceps brachii, infraspinatus, teres minor, and teres major.

The lateral deltoid muscle has split tendon fibers like interlocking crocodile teeth, which produce strong force even though the length of contraction is shorter than that of regular muscles. As shown in the picture on the far right, when the arm is raised, the deltoid muscle moves to the east.

The brachialis muscle (brachialis muscle), biceps brachii muscle (biceps brachii muscle), brachioradialis muscle (brachioradialis muscle), and wrist extensor longus longus (extensor carpi radialis muscle) that bend the arm.

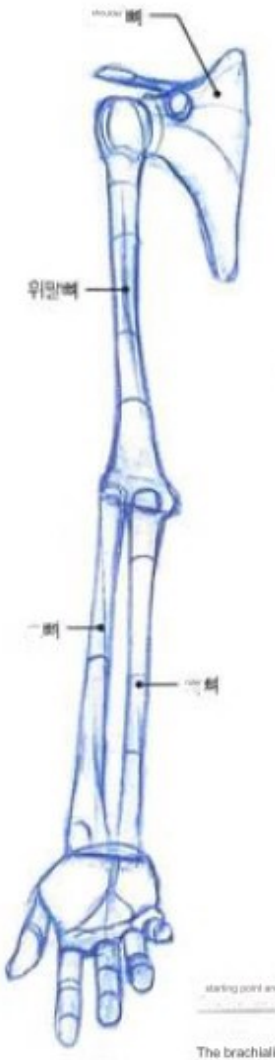


Figure 1

Figure 2-1

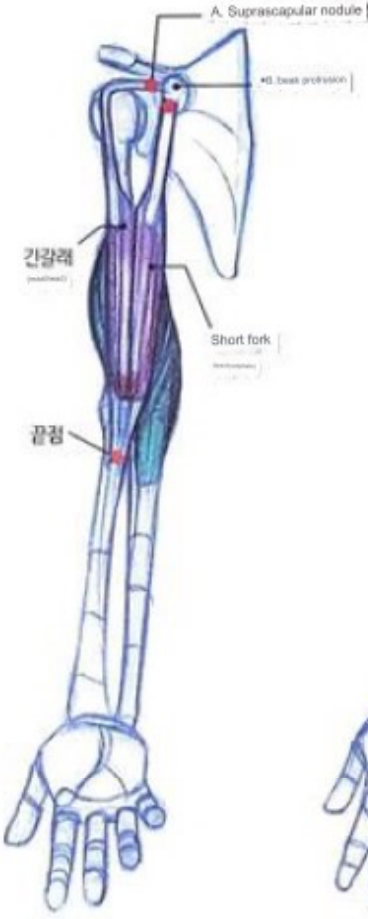


Figure 2-2

Figure 2-3

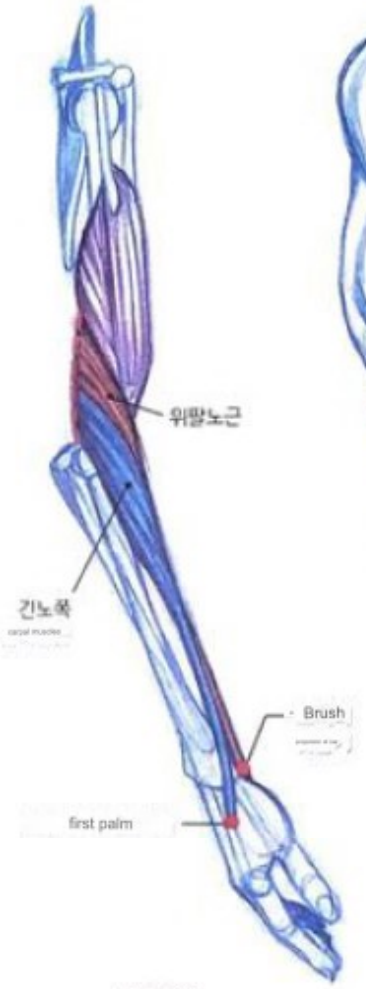


Figure 3-1

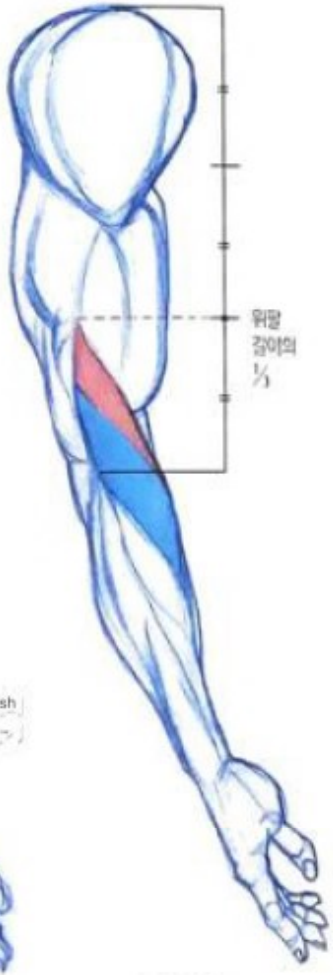
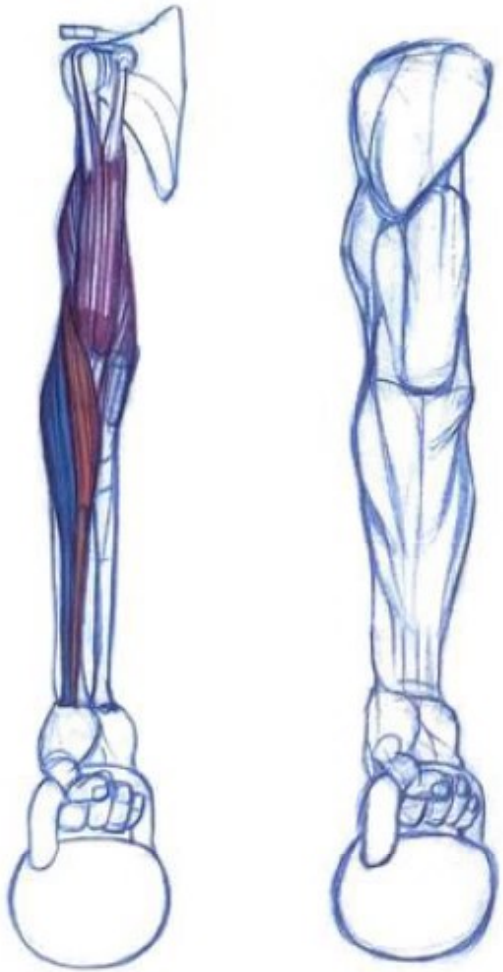


Figure 3-2

starting point and ending point

The brachialis muscle begins at the dotted line on the side of the humerus in Figure 2-1 and ends at the end point marked on the ulna. As shown in Figure 2-2, the biceps brachii muscle is divided into a long branch and a short branch. The long branch starts from two points, the suprascapular tuberosity (A), and the short branch starts from two points, the coronal process (B), and connects to one point of effort. It's possible. The biceps brachii muscle covers the upper arm and extends the upper arm.

Most of them are covered. The brachialis muscle is wider than the biceps brachii muscle, so it sticks out to both sides as shown in Figure 2-2. Let's check the final position through Figure 2-3 to see how it actually appears. The brachioradialis and extensor carpi longus muscles in Figure 3-1 start at about the length of the upper arm. The brachioradialis muscle attaches to the colliculus of the ligament, and the carpi longus muscle ends at the base of the first metacarpal bone.



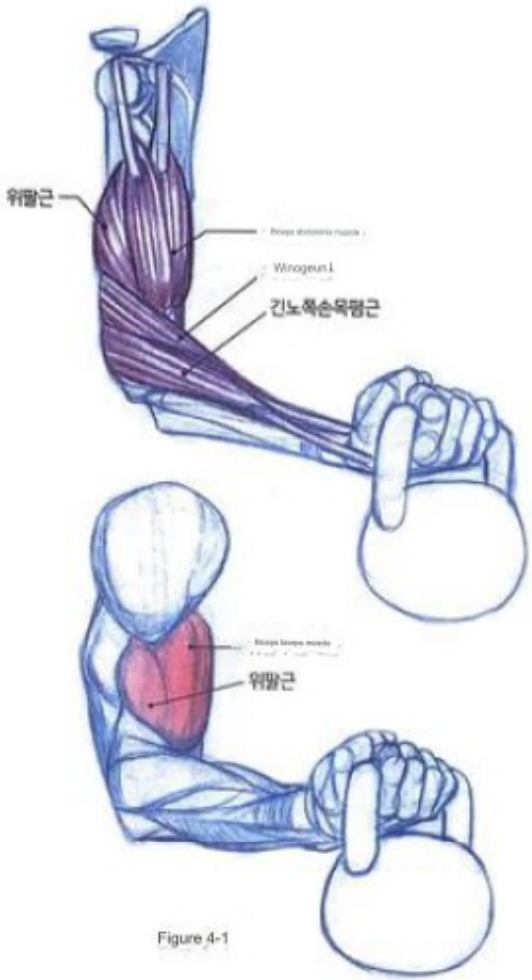


Figure 4-1

Figure 4-2

Figure 4-3

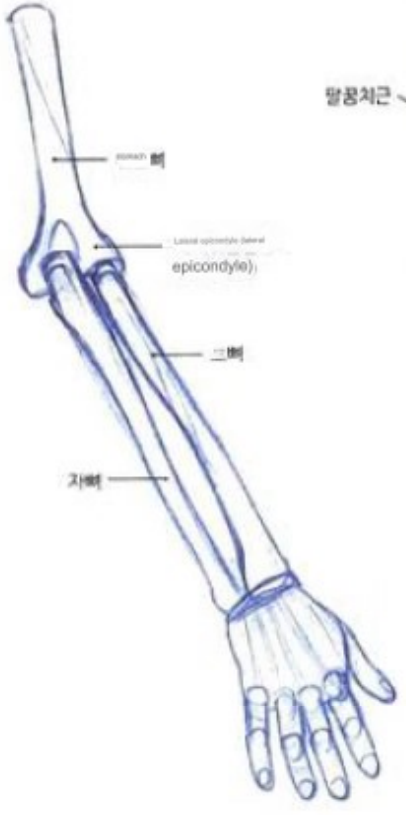
Use

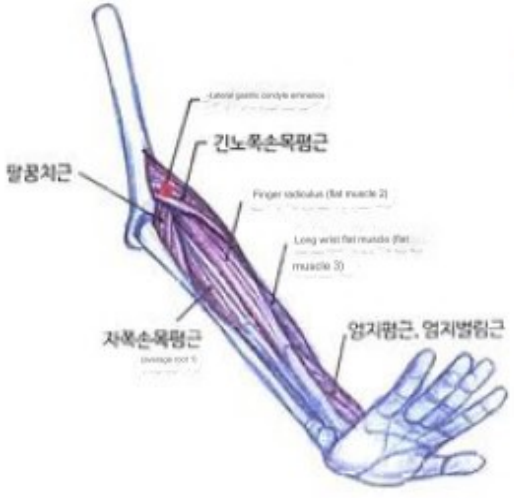
When you bend your arm with your palm facing the sky, as shown in Figure 4-1, your brachialis and biceps brachii muscles are used. As shown in Figure 4-2, when you bend your arm with your thumb facing upward, three muscles are used: the brachialis, biceps brachii, and brachialis. The back of your hand points toward the sky, as shown in Figure 4-3.

When you bend your arm in this position, all four muscles are used: brachialis, biceps brachii, brachialis, and carpi longus. The darker the color in the red area in the picture, the more commonly used muscles.

Because the muscles are shifted depending on the direction of the hand, the silhouette of the arm and the muscles mainly used also change.

■ Wrist extensor, flatus pollicis, and abductor pollicis muscles that extend the wrist





팔을 If you twist it like this, a curve is created

평근과 굽힘근이 that divides the ulna into a boundary.

Starting point and ending point, usage

To easily understand the various muscles that extend the wrist

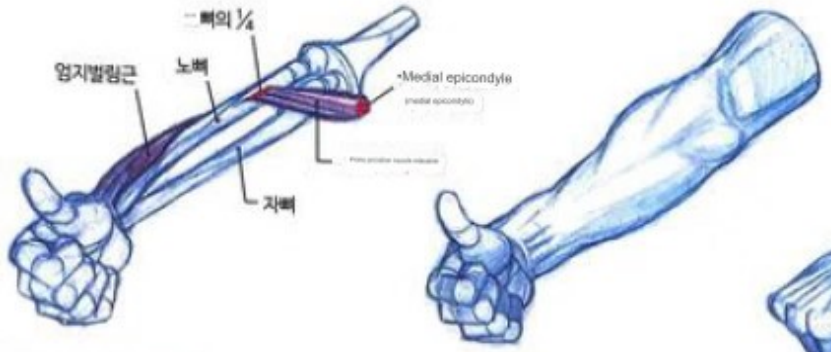
Let me explain by grouping several muscles together.

In this book, the cervical extensor and digitorum muscles are referred to.

We will refer to the extensor carpi brevis as 'pump muscles 1, 2, and 3.' The phimosis muscles originate from the lateral superior articular eminence of the humerus.

Pump muscles 1 and 3 attach to the backbone of the hand, and extensor muscle 2 passes through the back of the hand and attaches in four branches from the index finger to the little finger. The extensor muscles are used to straighten the fingers except the thumb and to tilt the wrist back. The extensor thumb and abductor thumb muscles, as the name suggests, are used to open and straighten the thumb, and come out between flat muscles 2 and 3 and attach to the thumb.

■ Pronation muscle, which rotates the wrist.



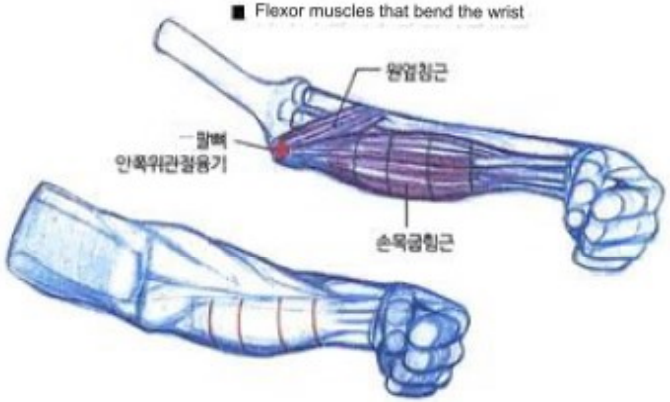
Starting point and ending point, usage

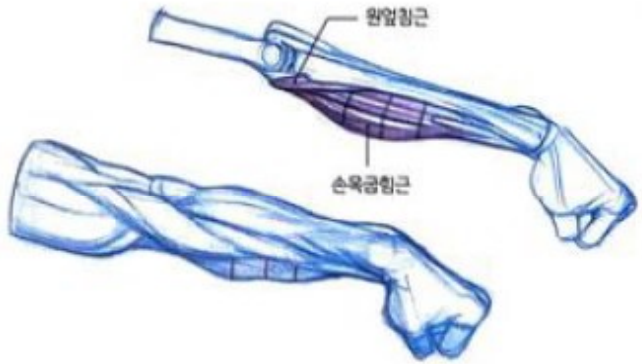
The protuberance teres originates from the medial gastric joint eminence and attaches to the approximately point of the notte.

The pronator teres is a muscle used when rotating the wrist, and when rotating, the ulna is fixed and only the song rotates.

Between the ulnar wrist and the finger extensor muscles, there is a peristalsis muscle. Since this muscle is small and barely visible, it will not be discussed in this book.

■ Flexor muscles that bend the wrist

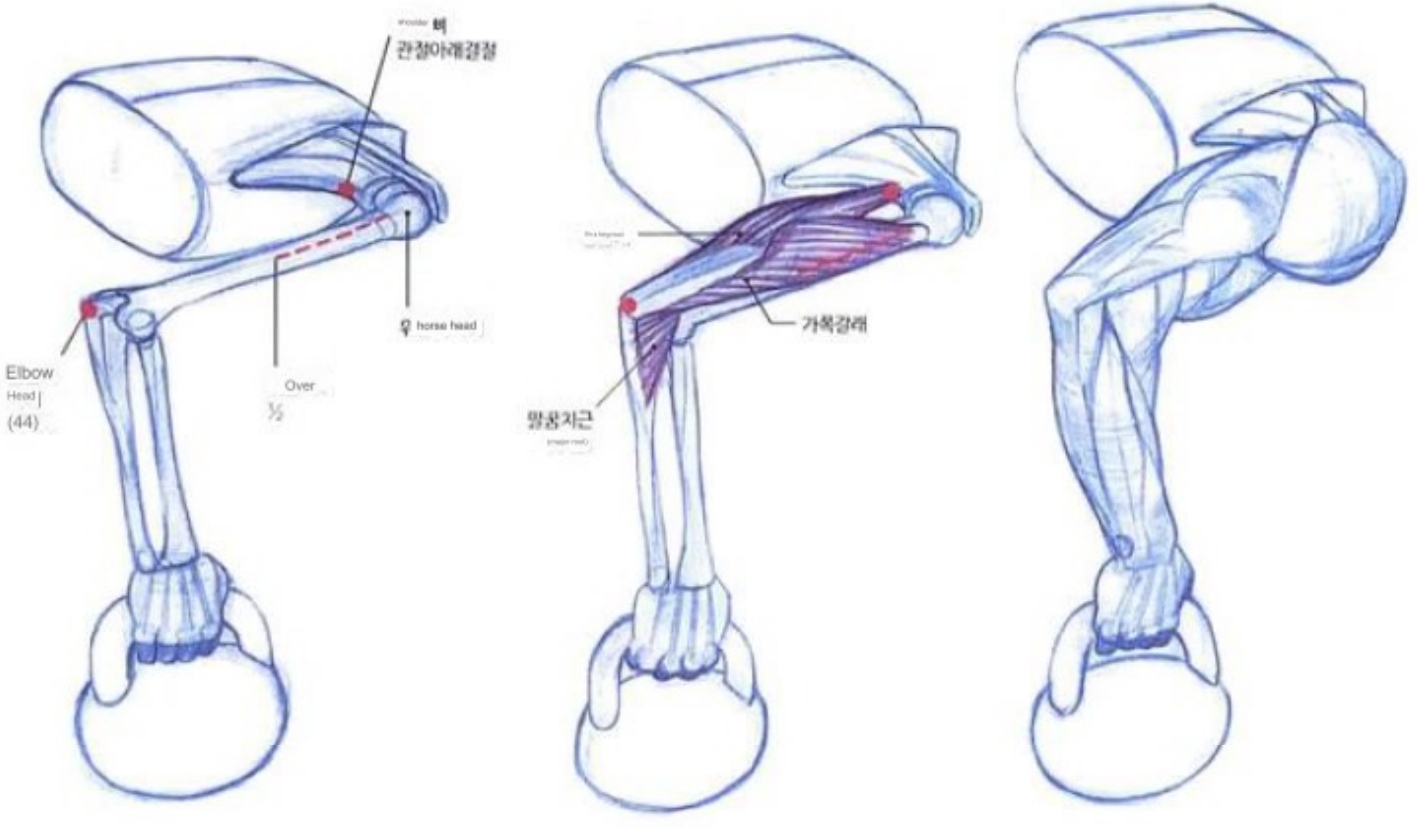




Starting point and ending point, usage

The muscles that bend the hand are classified into six groups, and in this book, they will be grouped together and referred to as 'wrist flexors.' This is because they are seemingly tied into one flow. The wrist flexor muscles originate from the medial superior articular eminence of the humerus, extend through the wrist to each finger, and play a role in flexing the fingers and wrist.

■ The biceps brachii muscle (triceps brachii) extends the arm.

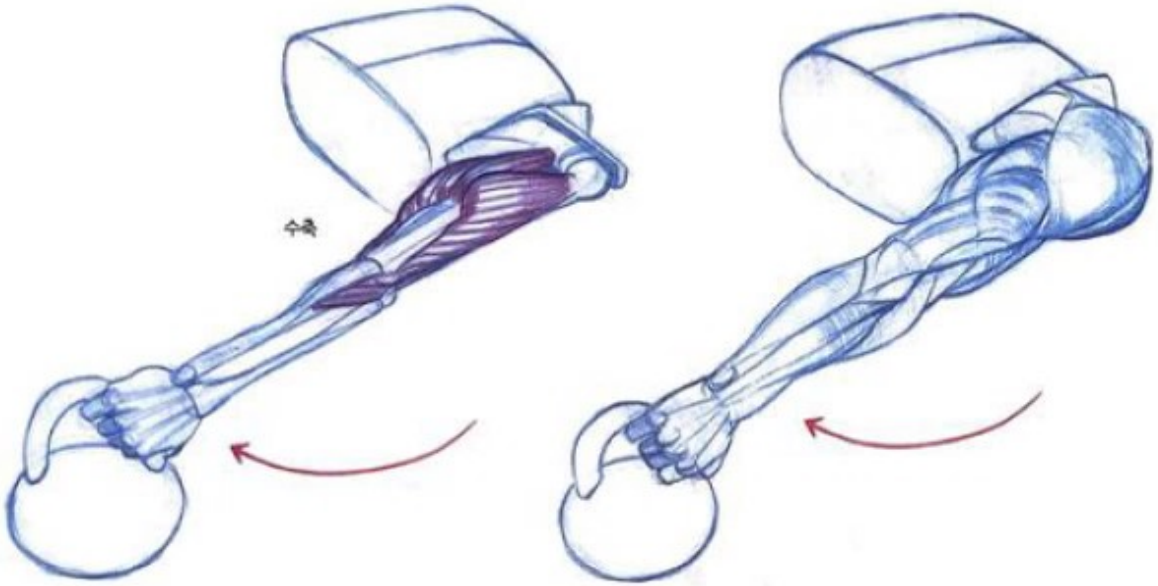


starting point and ending point

As its name suggests, the three-pronged muscle is composed of a medial branch, a family branch, and a long branch. The long branch attaches to the tubercle under the shoulder blade joint, and the family branch starts from the lower part of the head of the humerus to the approximately point of the humerus and goes to the head of the elbow. The inner fork is obscured by the long fork when viewed from the family and is not easily visible, so we will omit it. In the final appearance of the arm, most of the origin of the quadriceps brachii is covered by the deltoid muscle.

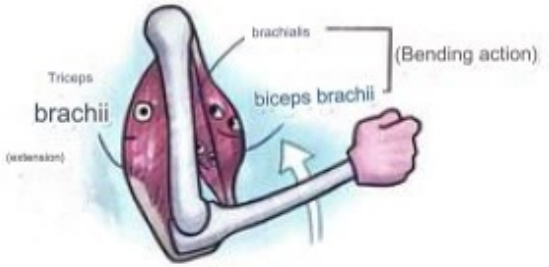
Characteristics of the quadriceps brachii

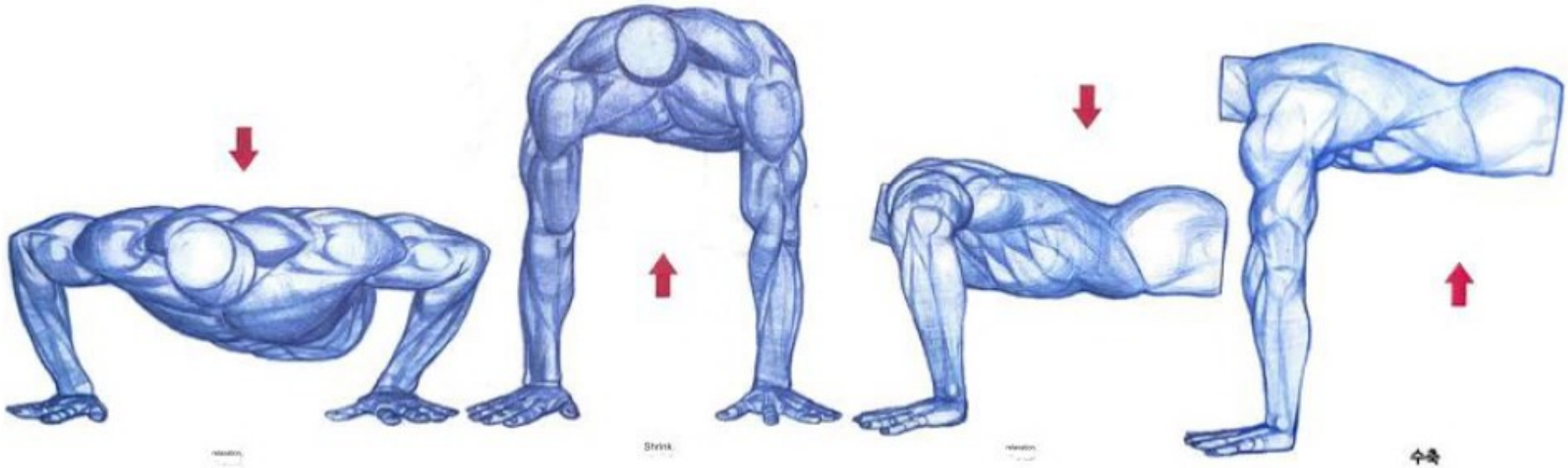
Unlike other muscles, the quadriceps brachii has a large tendon area. As muscles develop, the boundaries between the flat tendon area and tendon flesh become more distinct.



Use

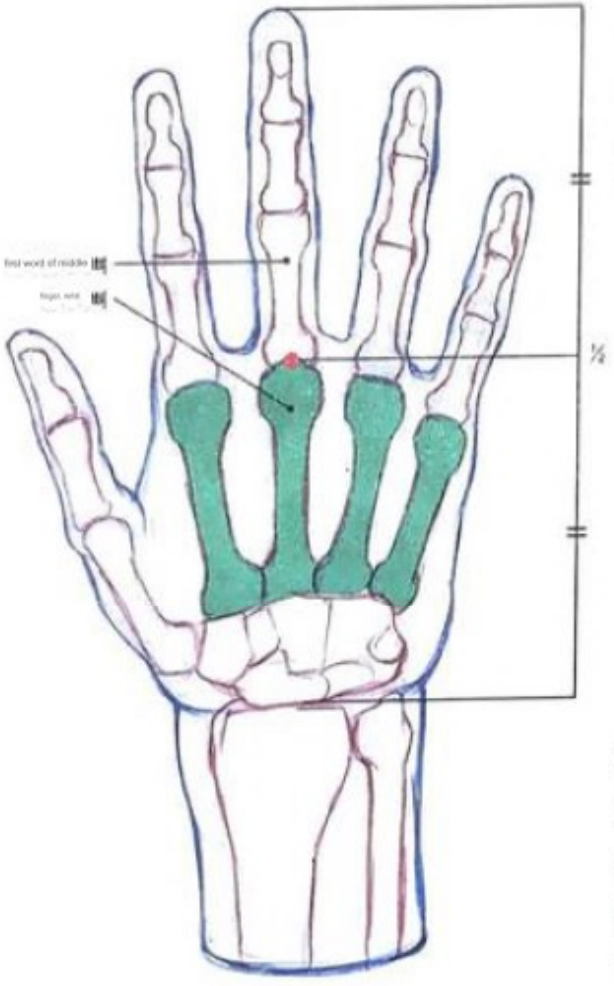
The biceps brachii muscle acts opposite to the brachialis brachii muscle and the biceps brachii muscle extends the arm backward. When doing push-ups, the pectoralis major muscle is in the torso. In your arms, the quadriceps muscle contracts, allowing you to raise your body from the floor.





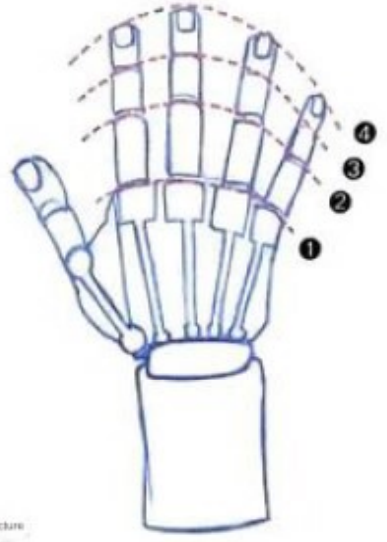
5 Hand structure and movement

■ Hand proportions and division



Evolution and shape of the hand

Which part of your body do you see the most? Most people think of the face, but the correct answer is the hand. So, when many artists create and draw the human body, the part they draw that most closely resembles their own body is the hand. Unlike other animals, humans became bipedal, which freed their hands and enabled them to hold objects, make tools, and hunt. In order for humans with weak physical abilities to hunt animals, they needed weapons that could attack from a long distance. Therefore, by developing weapons such as spears, they were able to hunt animals that were much stronger than themselves, and based on this hunting technology, mankind was able to survive to this day. To make precise tools and throw them in precise positions, the function of the thumb had to be developed. So, compared to other apes, humans evolved to have a longer thumb and the remaining four fingers were shorter, resulting in the present hand.

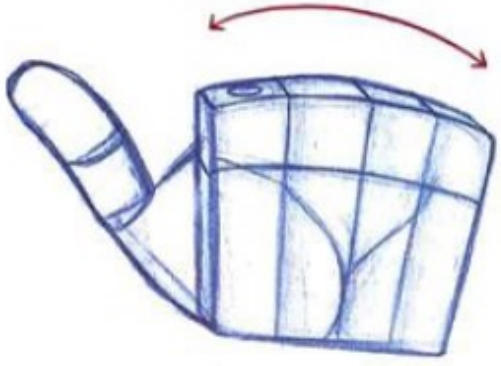


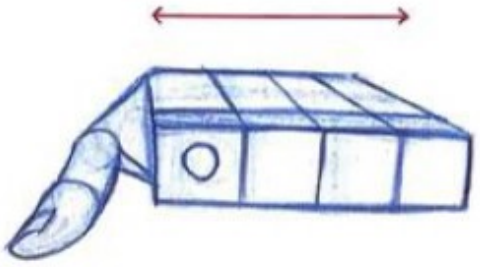
Hand proportions and structure

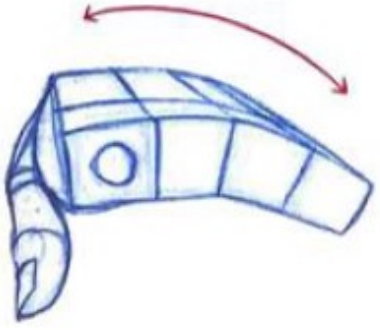
In this chapter, we will explain how to easily interpret the hand using a graphical approach rather than an anatomical approach.

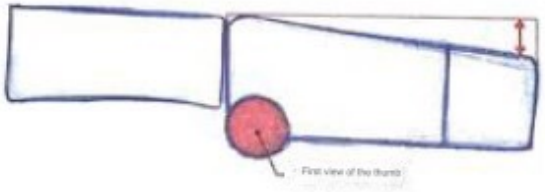
In the picture on the left, the red dot where the metacarpal bone and the first phalanx of the middle finger meet is the length from the tip of the palm to the tip of the middle finger. Additionally, if you connect the observation points of each finger joint, a parabola is drawn centered on the middle finger. Line 2 in the middle picture is also curved in the same way as the other dotted lines, so be careful not to draw it as a straight line. If you look at the hand structurally, you can think of it as divided into the palm, thumb, and the remaining four fingers.

■ Palm area

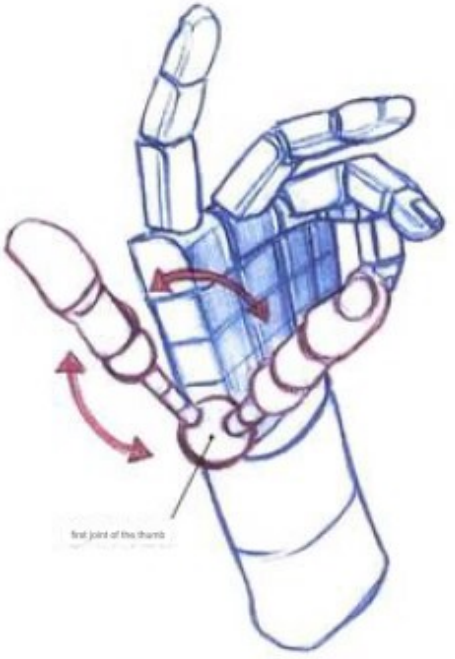








The palm area is the base of the hand. When you open your hand wide, the slope of the back of your hand becomes horizontal, and when you make a fist or bring your hands together, the shape of the back of your hand becomes curved. Normally, when you apply force naturally, the flow of the back of your hand is close to a curve. When viewed from the side, the thickness of the back of the hand becomes thinner from the wrist to the fingers. Don't forget that the first joint of the thumb is located toward the palm!



■ Different movements of the fingers

The thumb has evolved to have a greater degree of freedom than other fingers in order to hold objects or make tools. The first joint of the thumb only rotates to the inside of the palm and does not bend towards the back of the hand, so it is a saddle joint similar to a ball joint. Since the complex shape of the hand is created around the first joint of the thumb, you need to carefully observe the movement of the thumb, right? The movement of the first phalanx of the remaining four fingers is characterized by spreading to the side and bending forward. The middle and terminal joints are hinge joints that can only bend and straighten back and forth.

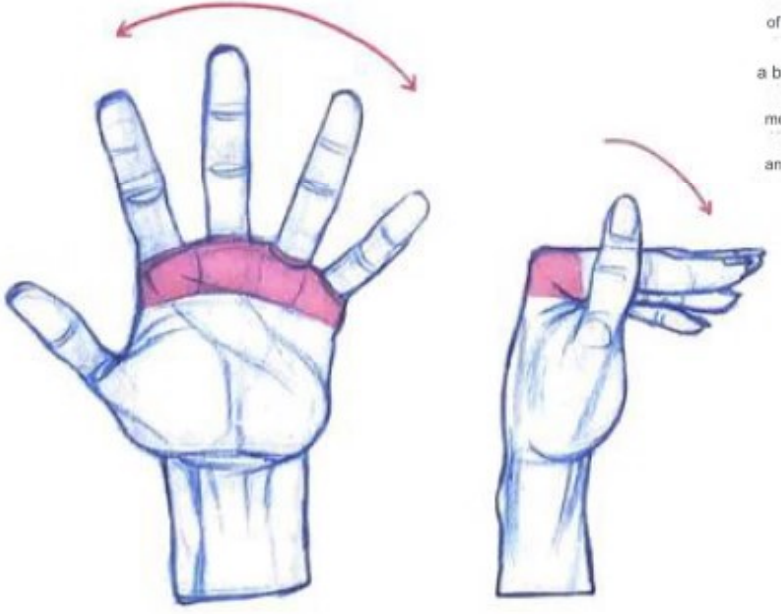


Figure 1

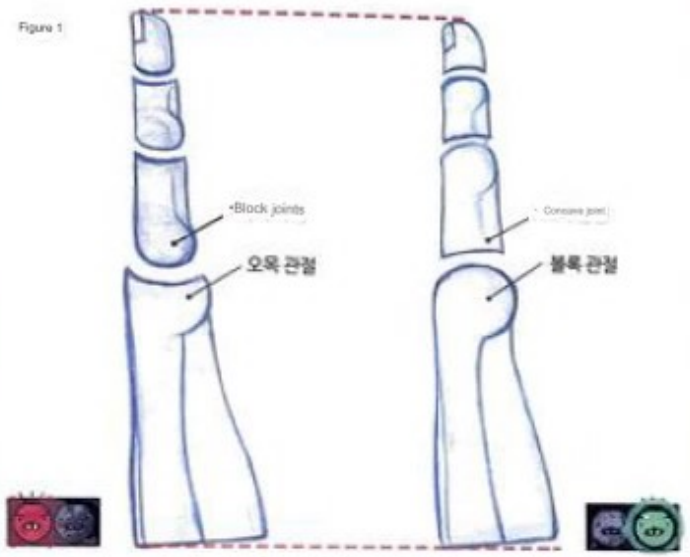
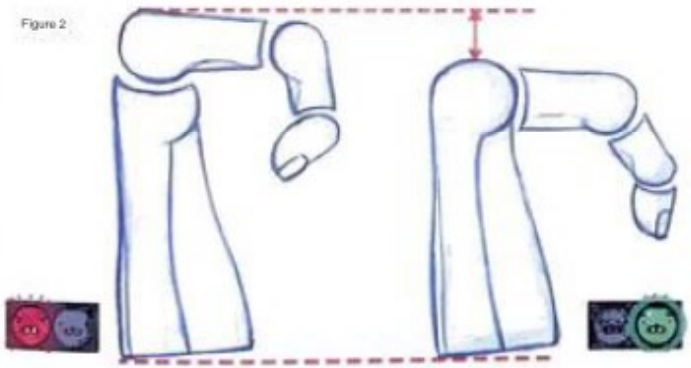


Figure 2



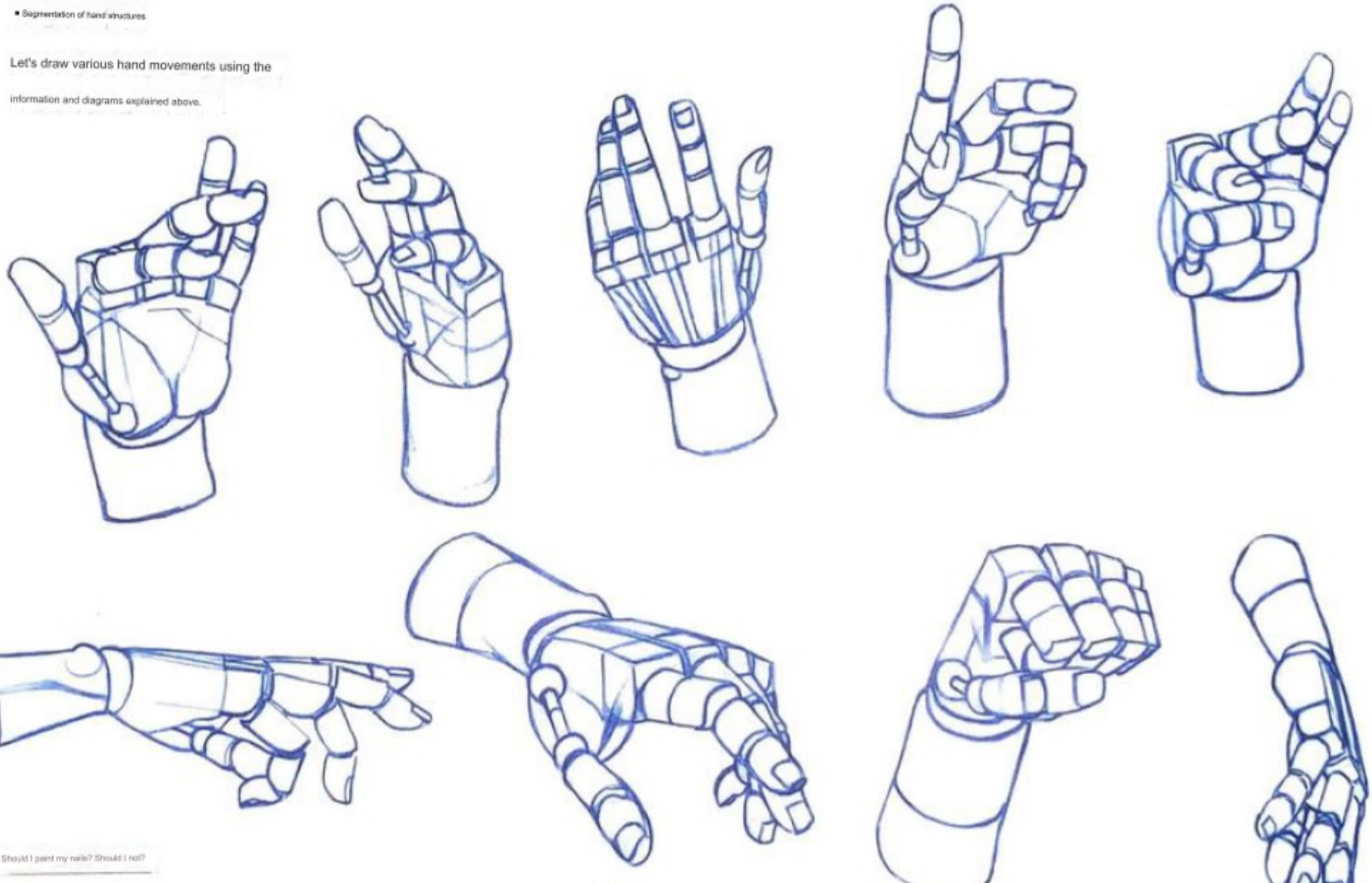
■ Convex joint and concave joint

Most joints in the human body work by combining a convex joint on one side with a concave joint on the other side. Let's take a look at Figure 1.2 to see what differences occur in movement depending on the positions of the convex joint and concave joint. Figure 1 shows a finger before bending where the concave and convex joints are in opposite positions. At this time, you can see that the hands are the same length. However, when I bent my fingers as shown in Figure 2, there was a difference in the length of the back of my hand. The right hand in Figures 1 and 2 shows correct joint structure. Because the shape of the hand changes depending on the positions of the convex and concave joints when moving, you need to know the positions of the joints well. Fingers are especially important because they have many joints.

■ Segmentation of hand structures

Let's draw various hand movements using the

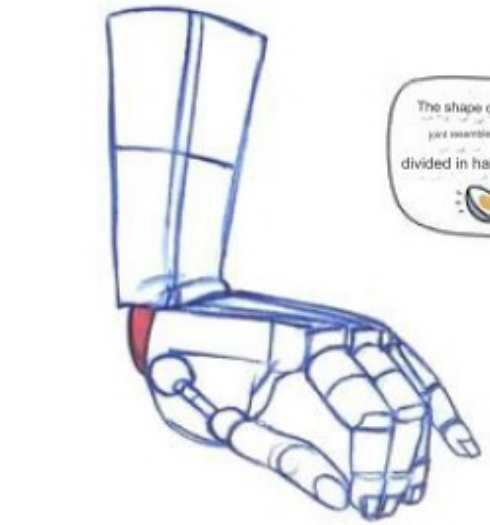
information and diagrams explained above.

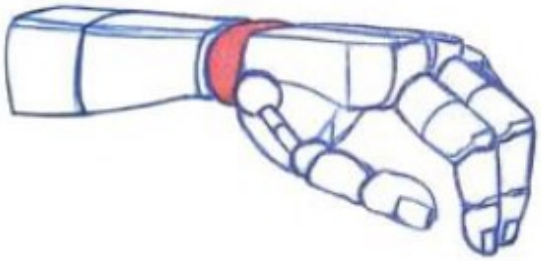


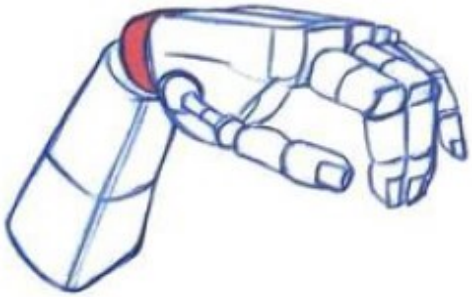
Should I paint my nails? Should I not?

There are times when I omit the nails because I feel like they add something more to an already complex shape.

However, it is a good idea to draw the nails because they show the direction of the fingers and make the hands more realistic!

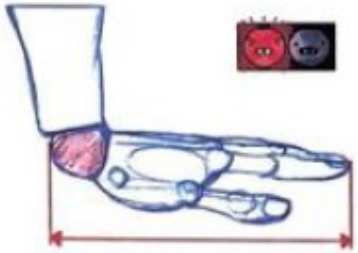


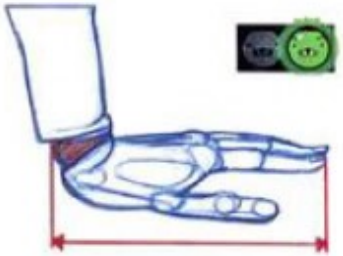


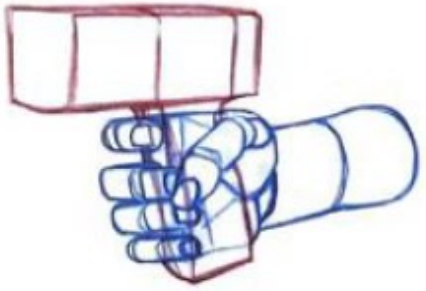


Shape of rimboard wrist joint

The wrist joint that connects the arm and hand is drawn in the shape of an oval cut in half. If you think of the shape of the joint as a round sphere as shown in the picture of the correct answer, when you bend your wrist, your arm will go up over the joint and your palm will become longer. When you raise your wrist, the back of your hand should be pressed as shown in the picture of the correct answer.







hand holding a tool

We don't hold the tool perpendicular to our wrist. It is held diagonally as shown in the picture above. If you try to hold the object vertically, you will not be able to hold the object tightly due to the thickness of the two thumbs. Try expressing the shape of your hand when holding an object such as a knife, baton, or gun at an angle like this.

■ Finger movement and direction

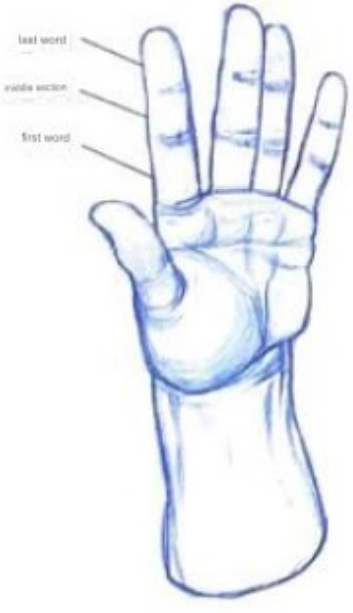
After drawing the geometry step, add the two hand bends that were omitted.

손 굽힘 두덩이

Please express the space between your fingers as an L shape, not a V shape.

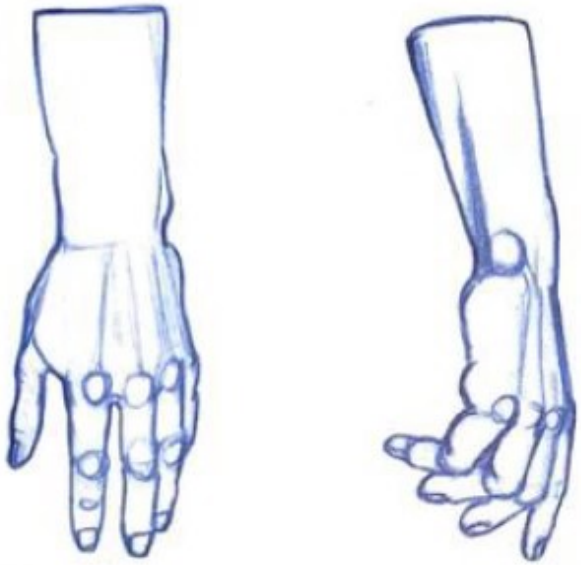
The order in which fingers bend

What is the point of natural movement when making a fist? That is, rather than bending starting from the tip of the finger, the first and middle joints are bent at the same time. When drawing a certain movement, you need to think about the before and after movement to draw a lively picture.



Hand shape without strength

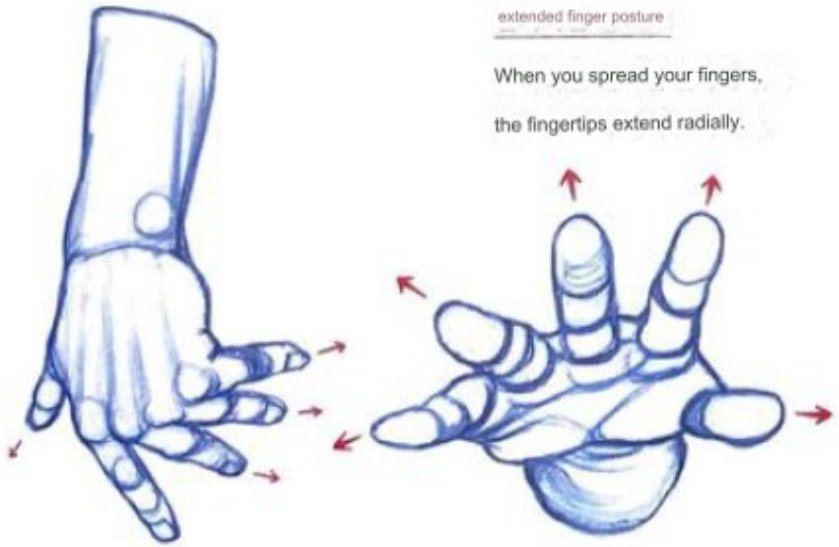
The index finger spreads out and gradually bends towards the little finger.



extended finger posture

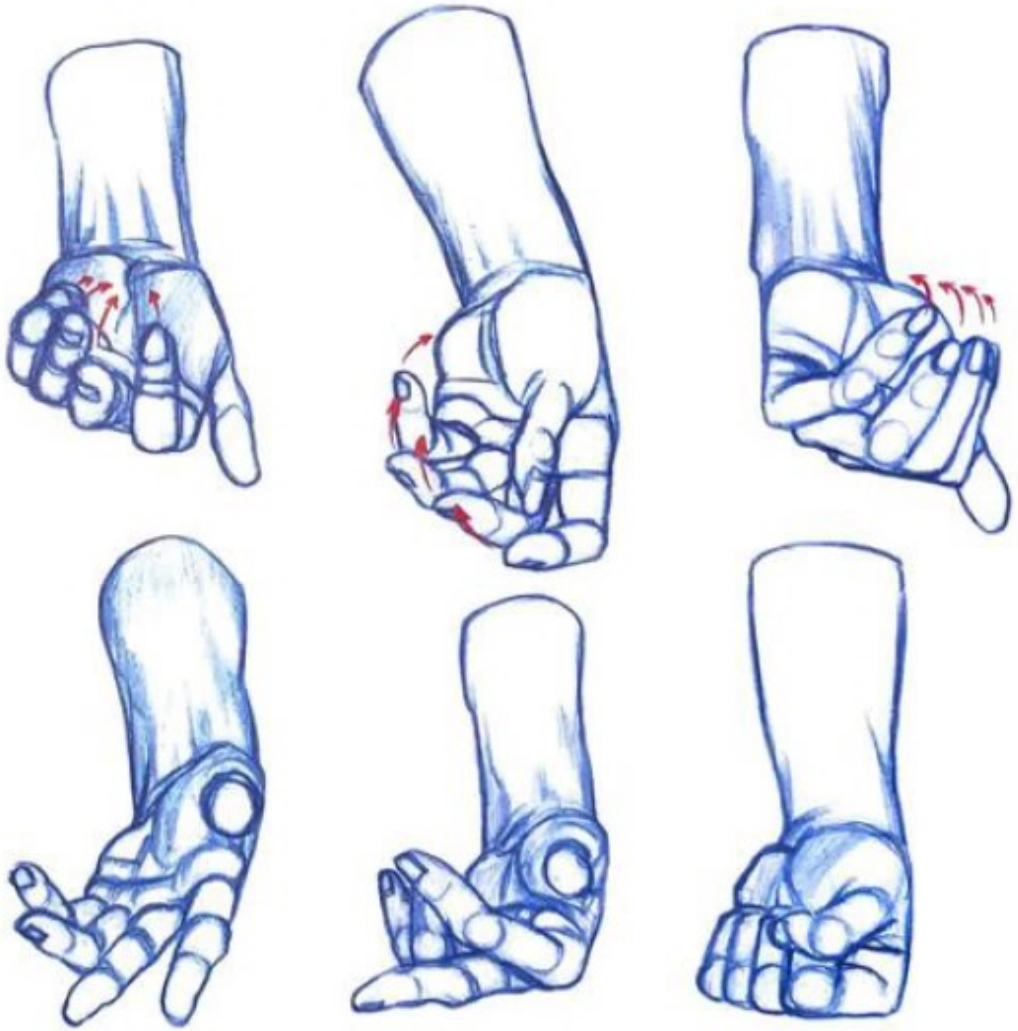
When you spread your fingers,

the fingertips extend radially.



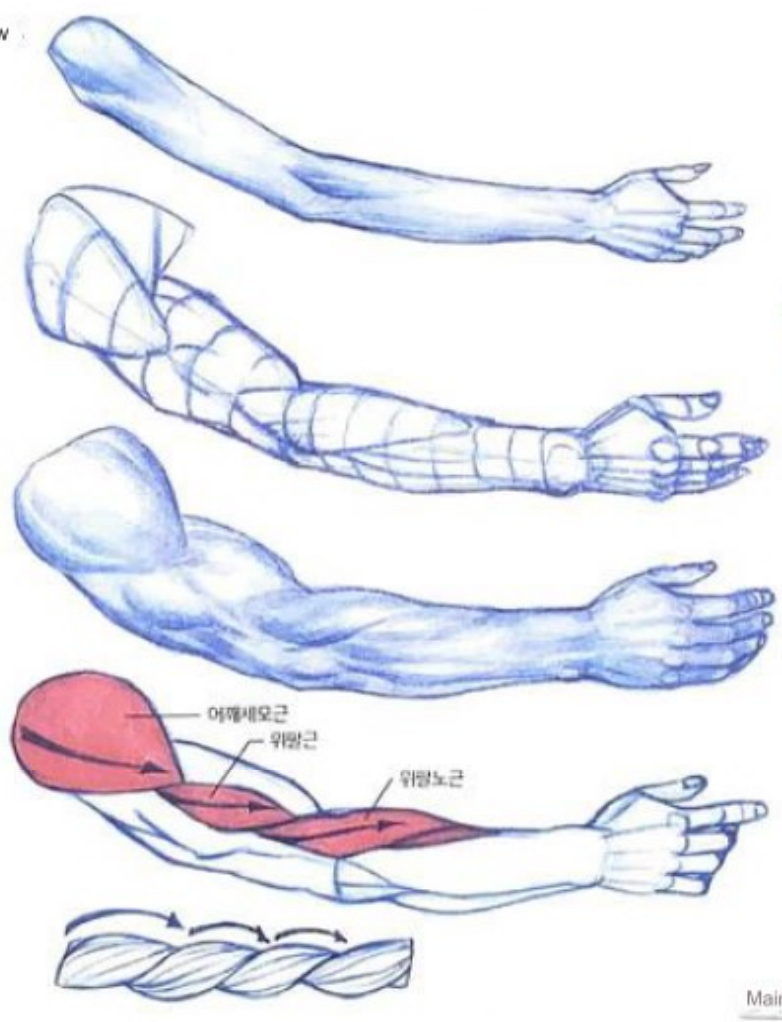
closed fingers posture

When you close your hands, each finger comes together toward the center of your palm. Because all the fingers are gathered toward the center like this, when you make a fist, the fingers interlock and there are no gaps. Because the bending angle of each finger is different, drawing a bent finger pose is more difficult than drawing a straightened finger pose.



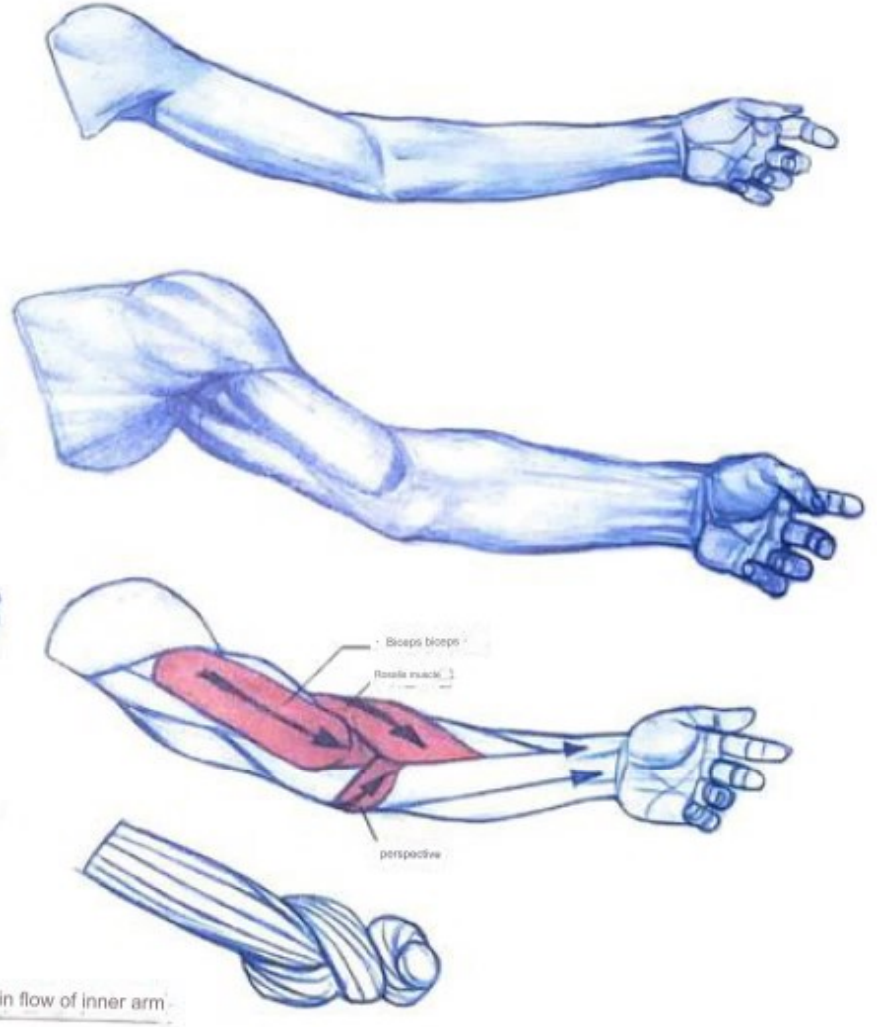
2 arm flow

■ Twist flow and knot flow



Main flow of outer arm

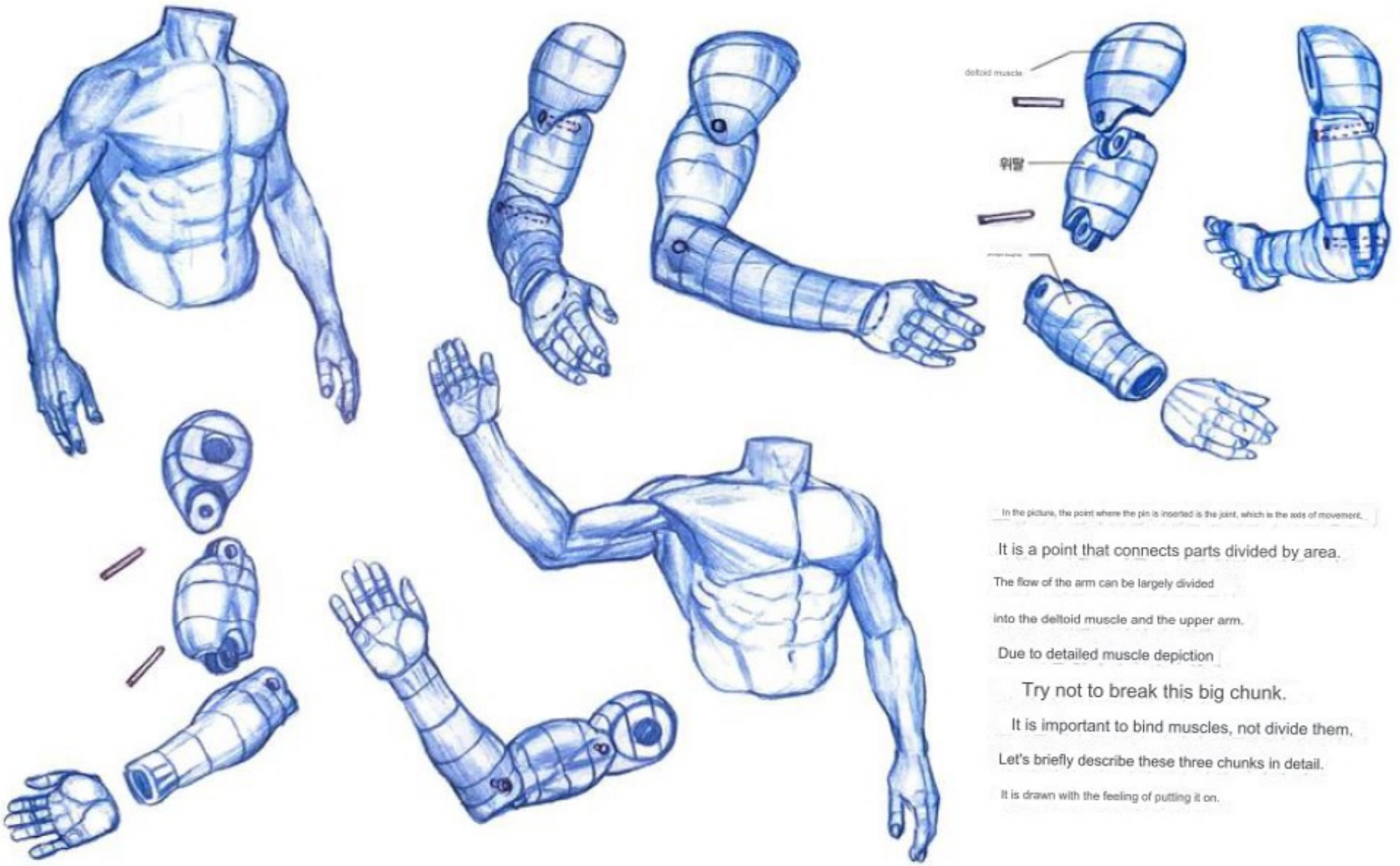
When looking at the arm from the outside, the deltoid scapulae and brachialis brachii are shaped like twisted ropes like a twist. By adding the remaining muscles around this flow, you can easily express the flow of the arm.



Main flow of inner arm

Many people find it difficult to draw where joints fold.

In the case of the arm, it is easy to understand if you think of the shape of the biceps brachii digging in between the teres teres and brachialis muscles like a rope knot.



In the picture, the point where the pin is inserted is the joint, which is the axis of movement.

It is a point that connects parts divided by area.

The flow of the arm can be largely divided

into the deltoid muscle and the upper arm.

Due to detailed muscle depiction

Try not to break this big chunk.

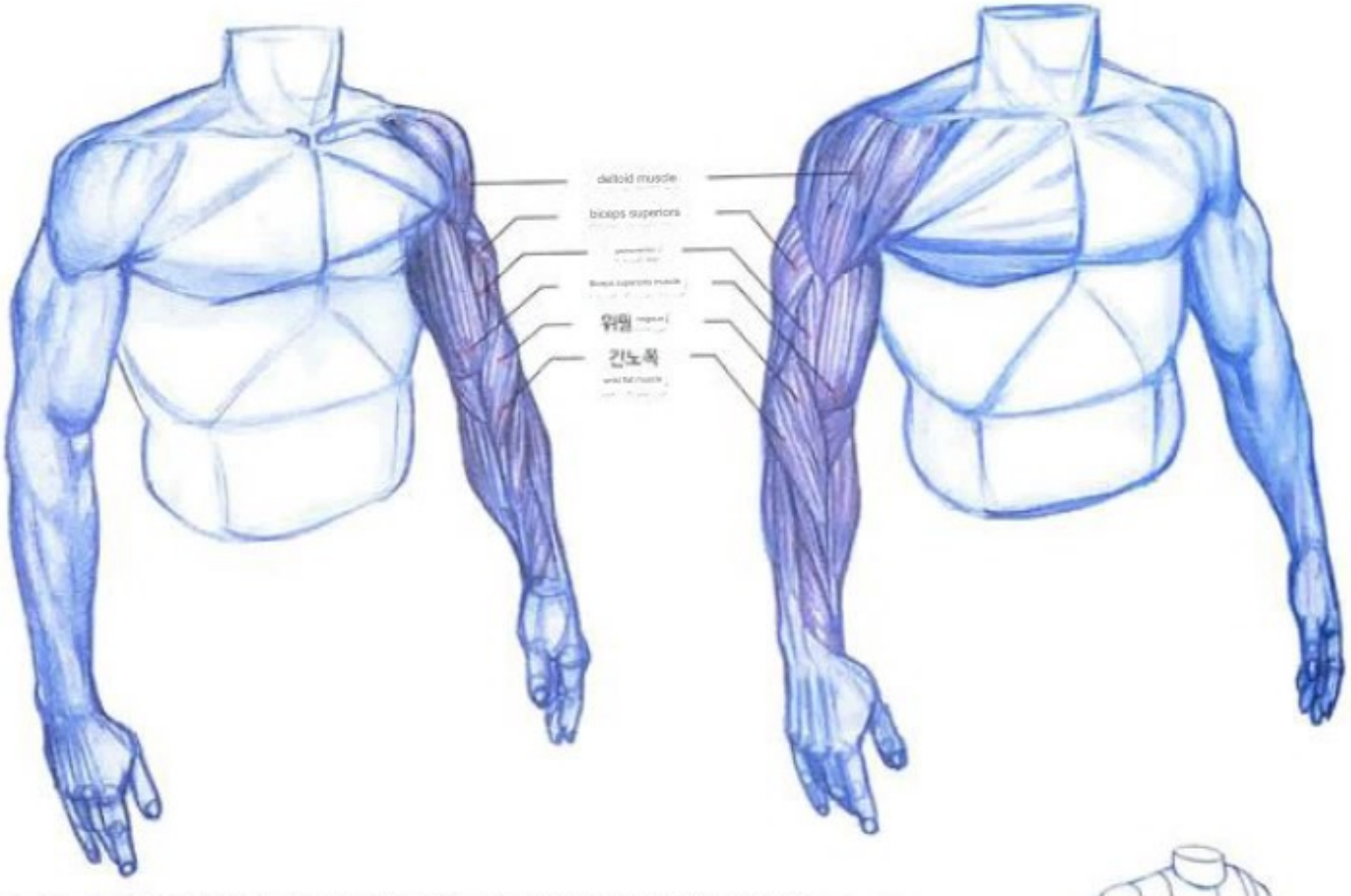
It is important to bind muscles, not divide them.

Let's briefly describe these three chunks in detail.

It is drawn with the feeling of putting it on.

■ O-shaped flow of male arm

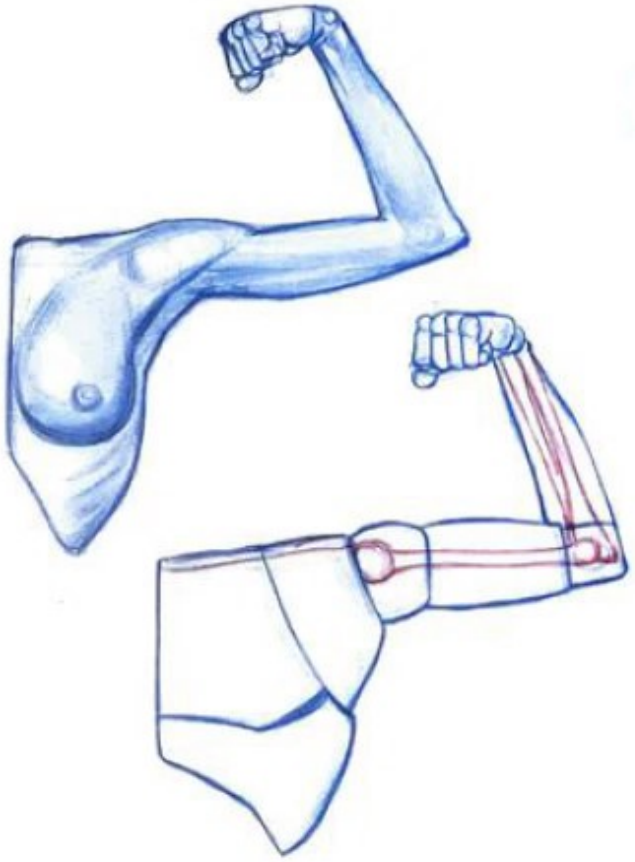
Figure 1

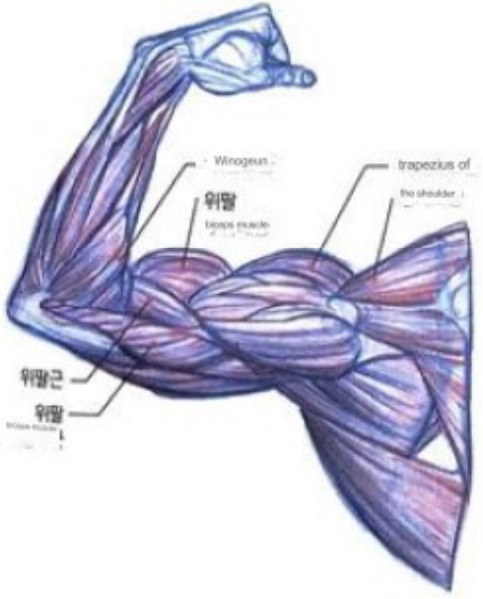


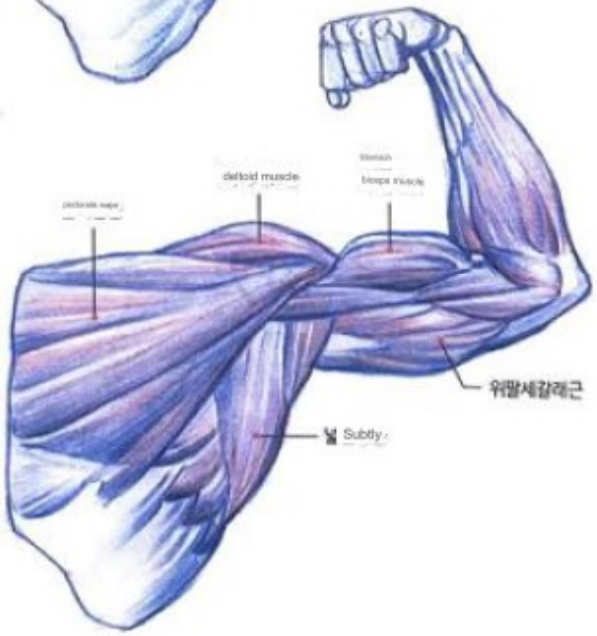
When looking at the basic posture of a naturally standing human body from a 45-degree angle, the flow of both arms should not be drawn at the same angle as shown in Figure 2. If you relax your arms and stand at attention, your arms will gently bend inward toward your body, forming a () shape, as shown in the picture. Therefore, the arm closest to the field of view is bent inside the body, and the opposite arm appears as a straight line with no bends. At this time, pay attention to the angle of the hand where the back of the hand is visible on one side and the side edge is visible on the other side. Only by properly drawing this large flow and then expressing the muscles can a natural and stable human body be created.

Figure 2

■ Biceps brachii emphasis posture







This posture, typical of bodybuilders, highlights the overall muscles of the upper body. From the front, the biceps brachii and latissimus dorsi are emphasized, while from the back, the deltoids, biceps brachii, and overall back muscles are emphasized. When expressing this posture in a picture, it is difficult to locate the armpit area where many muscles are intertwined from the front, and it is difficult to locate the deltoid muscle that extends to the back from the back. In any posture, establishing a large silhouette is more important than depicting detailed muscles, so for complex structures, try to find flow in simplified shapes.

Figure 1

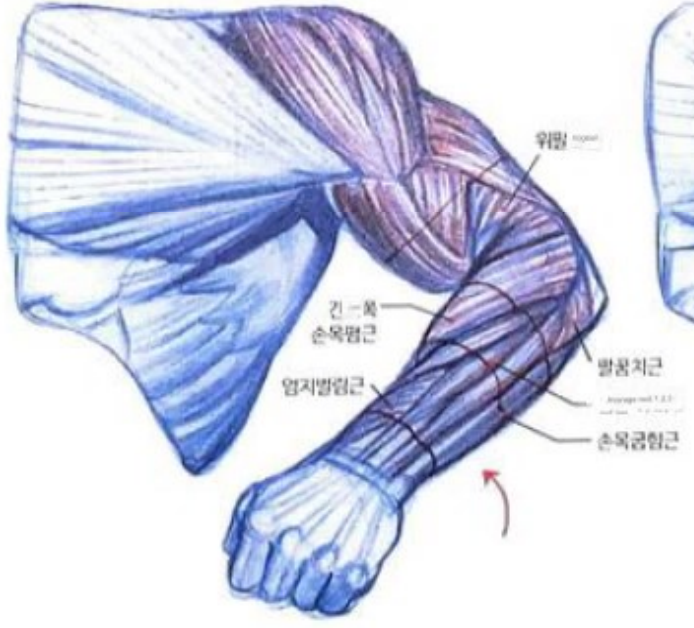
Figure 2

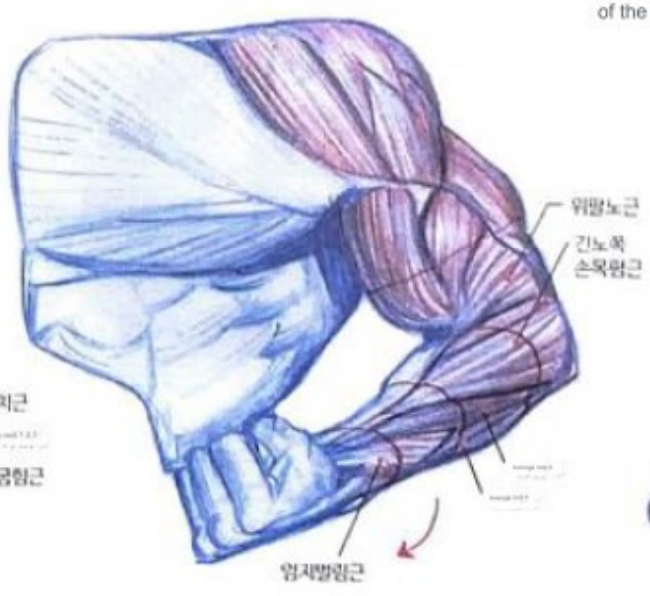
■ Changes in flow depending on the direction of the hand

If you look at the picture on the left, you can see that there are many changes in the flow of the arm when the arm is bent forward 90 degrees and the back of the hand is facing upward and downward.

As shown in the picture, when the back of your hand points towards the sky, the biceps brachii muscle attached to the radial bone rotates together with the radial bone, causing the muscle to become twisted and unable to exert force. On the other hand, as shown in Figure 2, when the palm faces the sky, the lumbar bone rotates in the opposite direction, releasing the twisted biceps brachii muscle and creating a state in which force can be applied.

Because the hand direction in Figure 1 cannot exert force on the arm as in the posture in Figure 2, the angled flow that occurs when muscles contract is not created. As the muscles follow the direction of the hand, the flow of the arm changes.





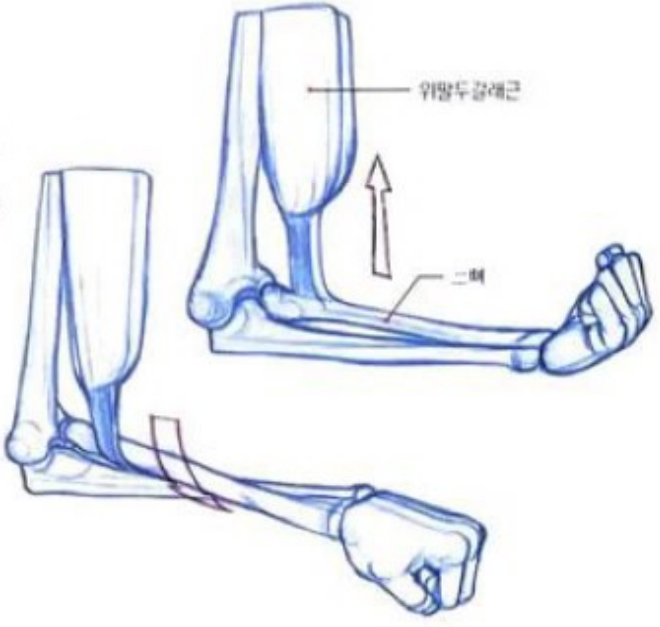


Figure 3

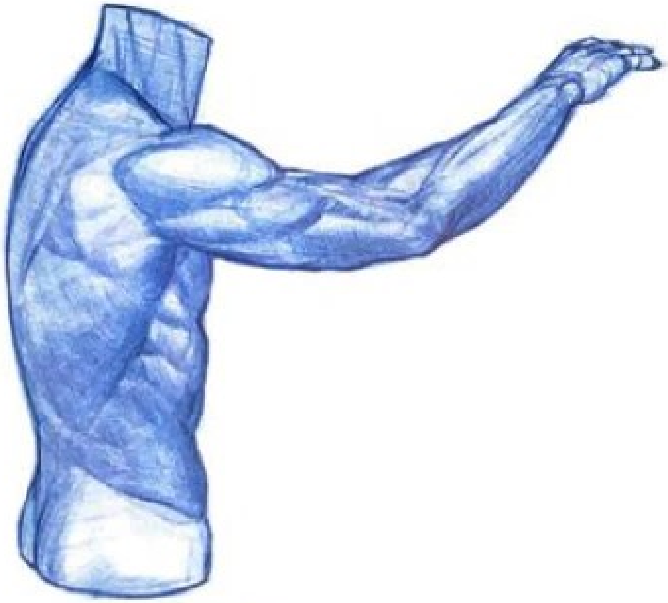
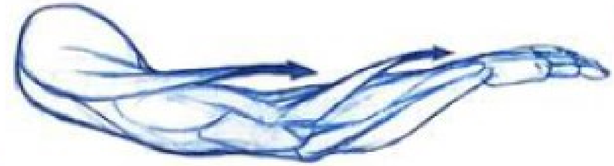
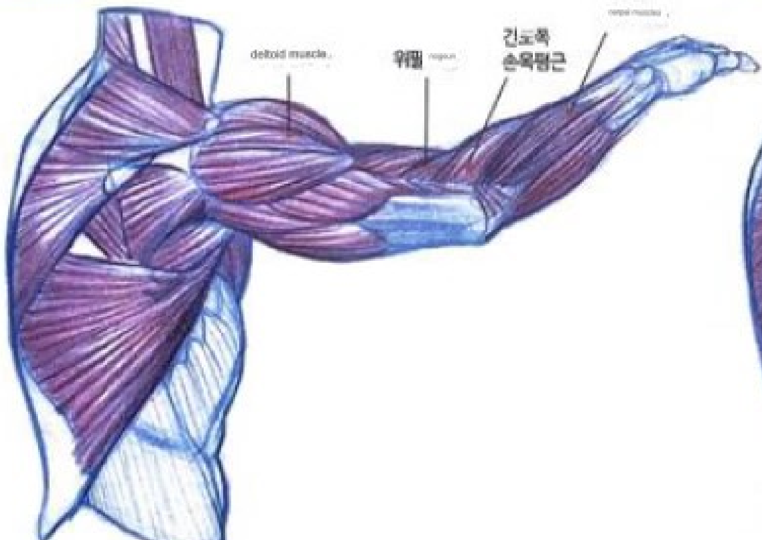


Figure 4





■ Twisting and loosening of arm muscles

Through Figures 3 and 4, the gathering of arm muscles and

Shall we observe the unraveling?

The arm muscle flow in Figure 3 is twisted. From the humerus, the arm rotates inward, causing the deltoid muscle to look upward. Additionally, as the back of the hand faces upward and the radial bone falls over, the brachioradialis, longus carpi extensor, and wrist extensor muscles twist towards the wrist.

Conversely, if you take the posture shown in Figure 4, all the muscles mentioned above will be released from their twisted state and create a straight flow.

■ Posture that emphasizes the quadriceps brachii

Figure 1

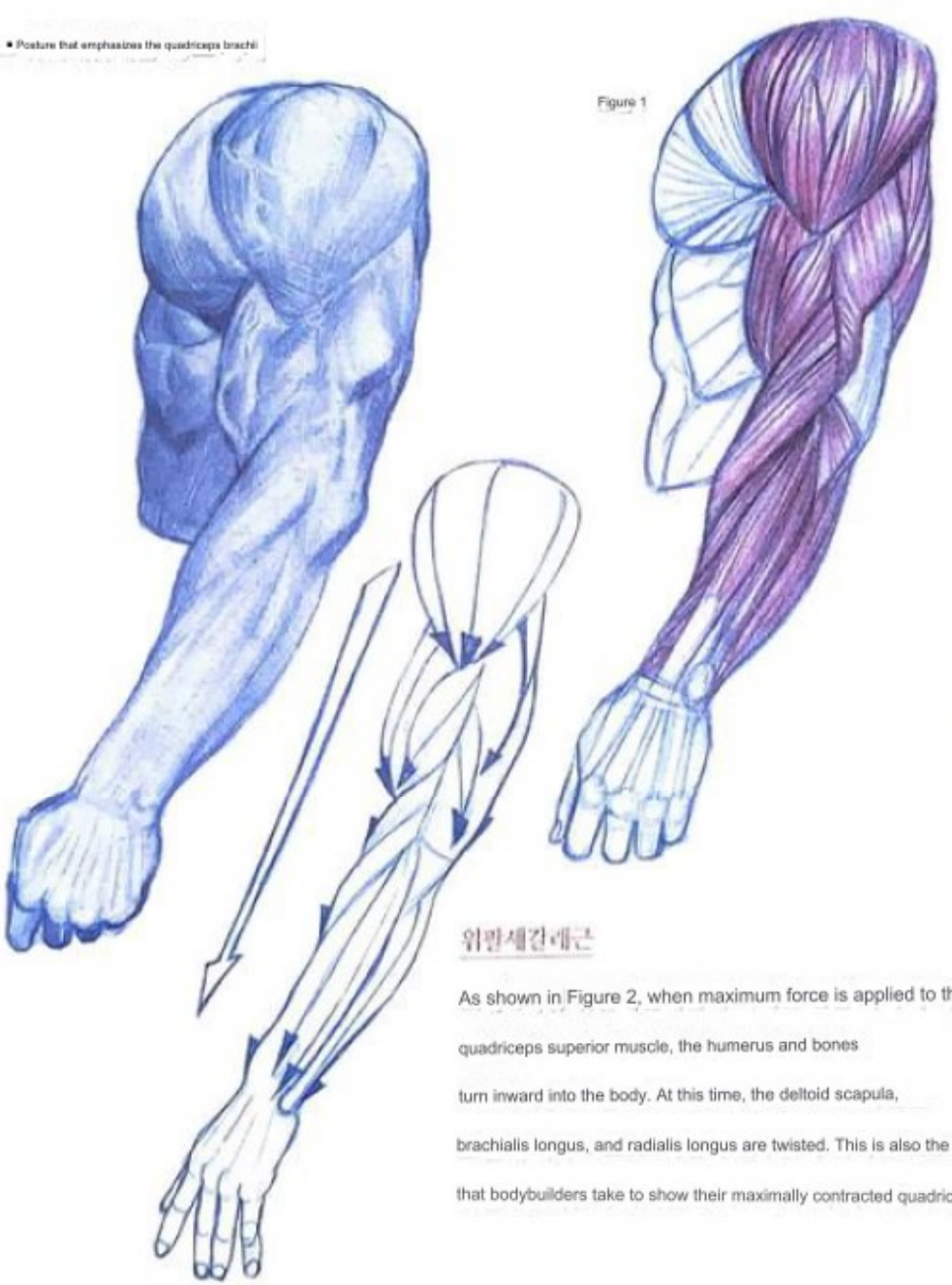


Figure 2

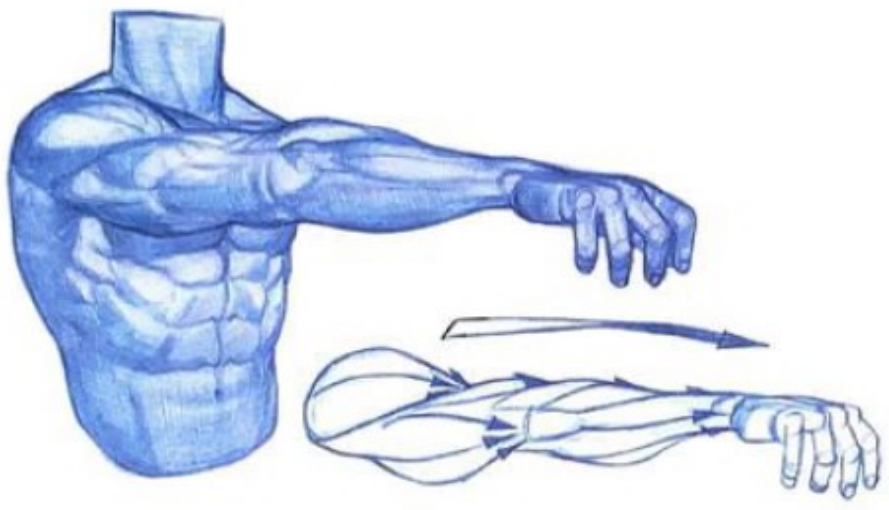
위팔세갈래근

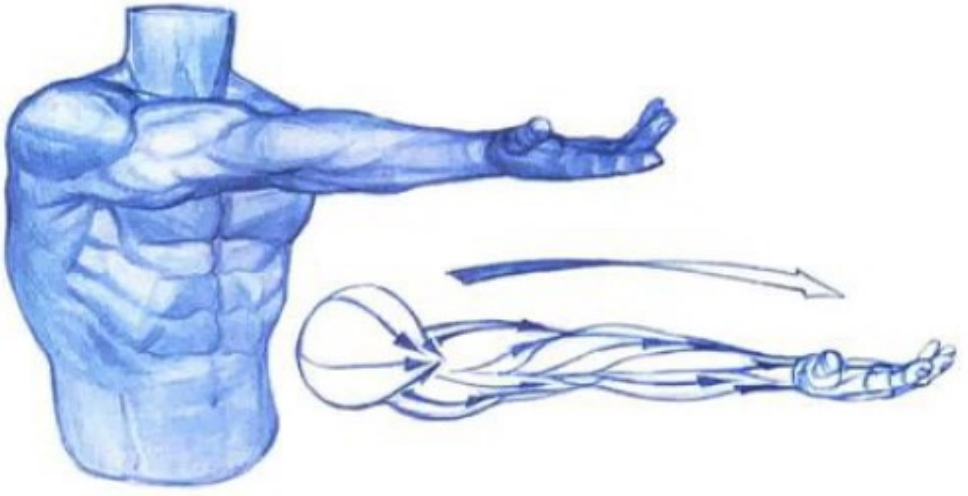
As shown in Figure 2, when maximum force is applied to the quadriceps superior muscle, the humerus and bones turn inward into the body. At this time, the deltoid scapula, brachialis longus, and radialis longus are twisted. This is also the posture that bodybuilders take to show their maximally contracted quadriceps muscles.

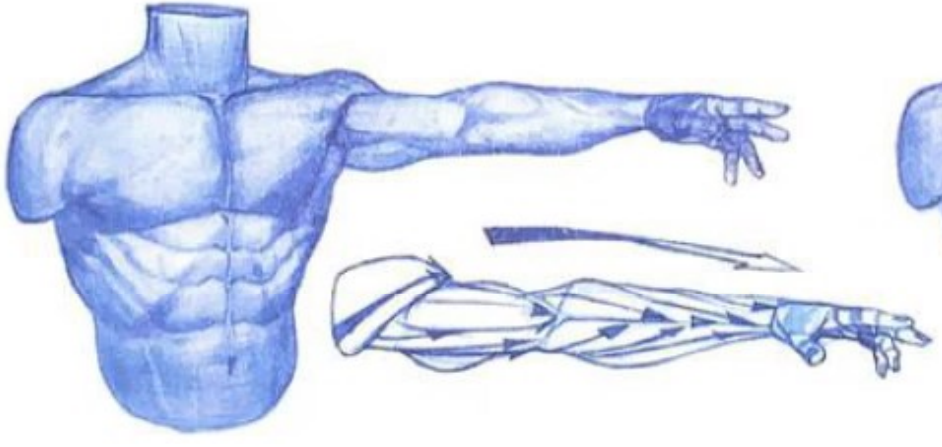
Natural relaxation and contraction

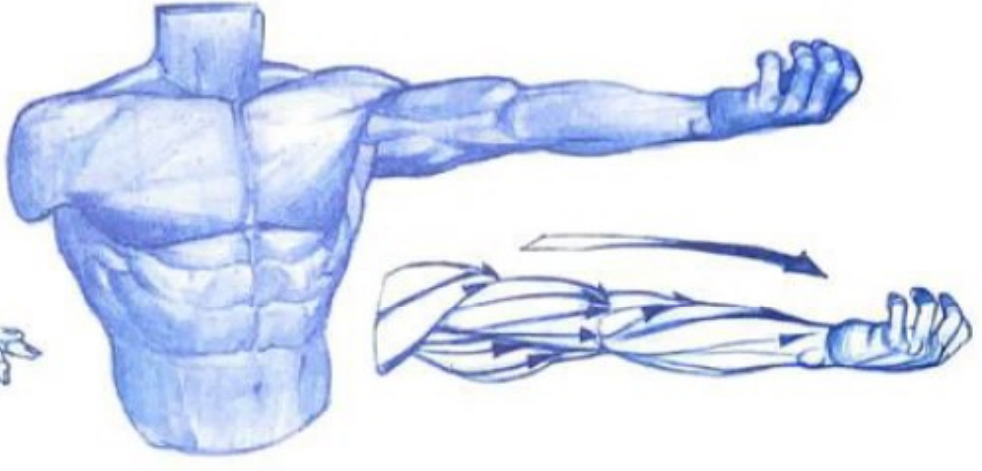
These pictures show the poses taken on the left page, and are shown completely on the back.

This is what I saw. When you apply strength to the quadriceps brachii, not only the muscles in that area contract, but all surrounding muscles also contract. You can intentionally apply force to just one muscle, but if you apply force naturally without intention, the force also applies to surrounding muscles. If you draw with these situations in mind, you will get a more natural flow of movement. You must be able to express the differences in shape that occur depending on the state of muscle relaxation and contraction.



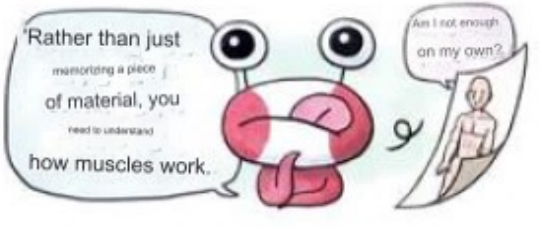


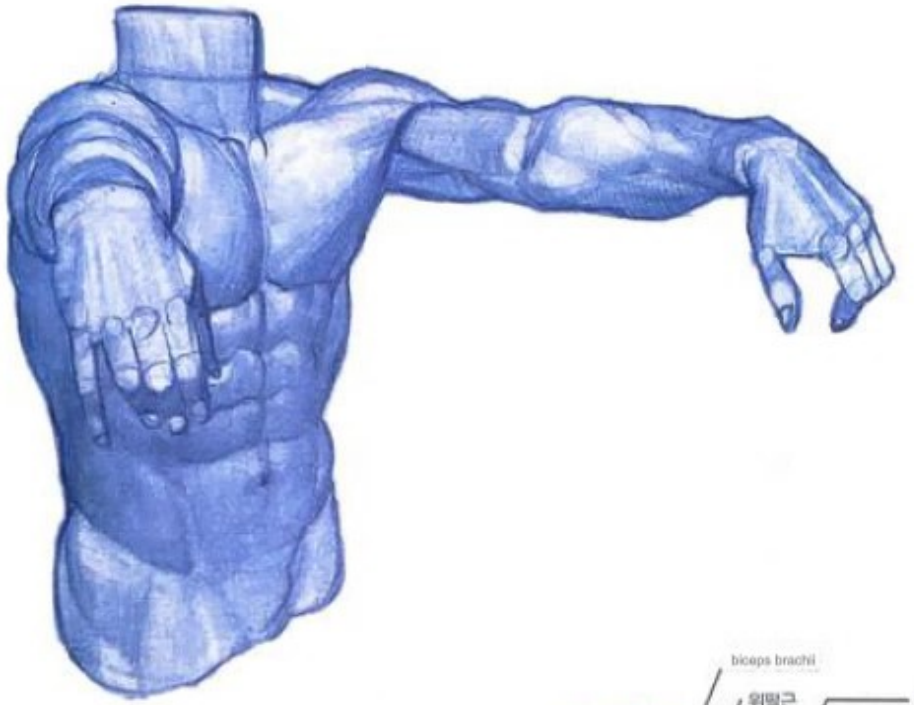


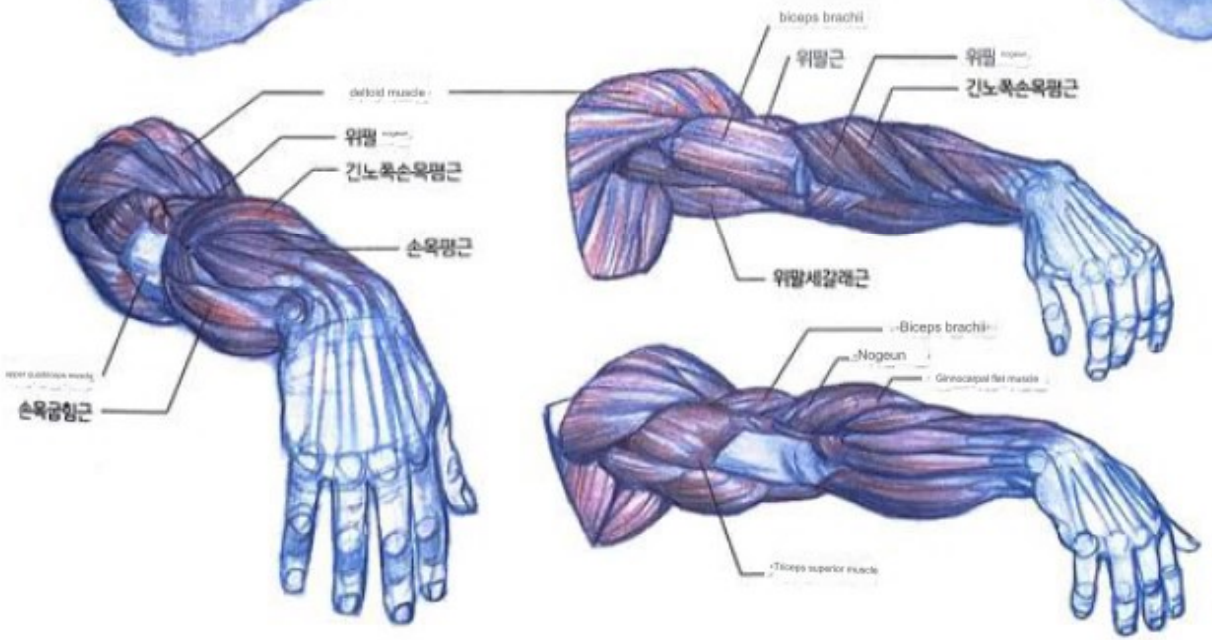


• Pronation and prolapse of the arm

In the picture above, you can see that the head of the humerus and the arm rotate as the hand is flipped over and over, changing the overall outline of the arm. When the bone rotates, the muscle rotates along with it, changing the external flow. Since the flow of the arm is determined by the direction of the hand, first determine the movement of the hand and then draw the arm. The reason muscles are difficult is because the direction of the muscles also changes depending on the movement.



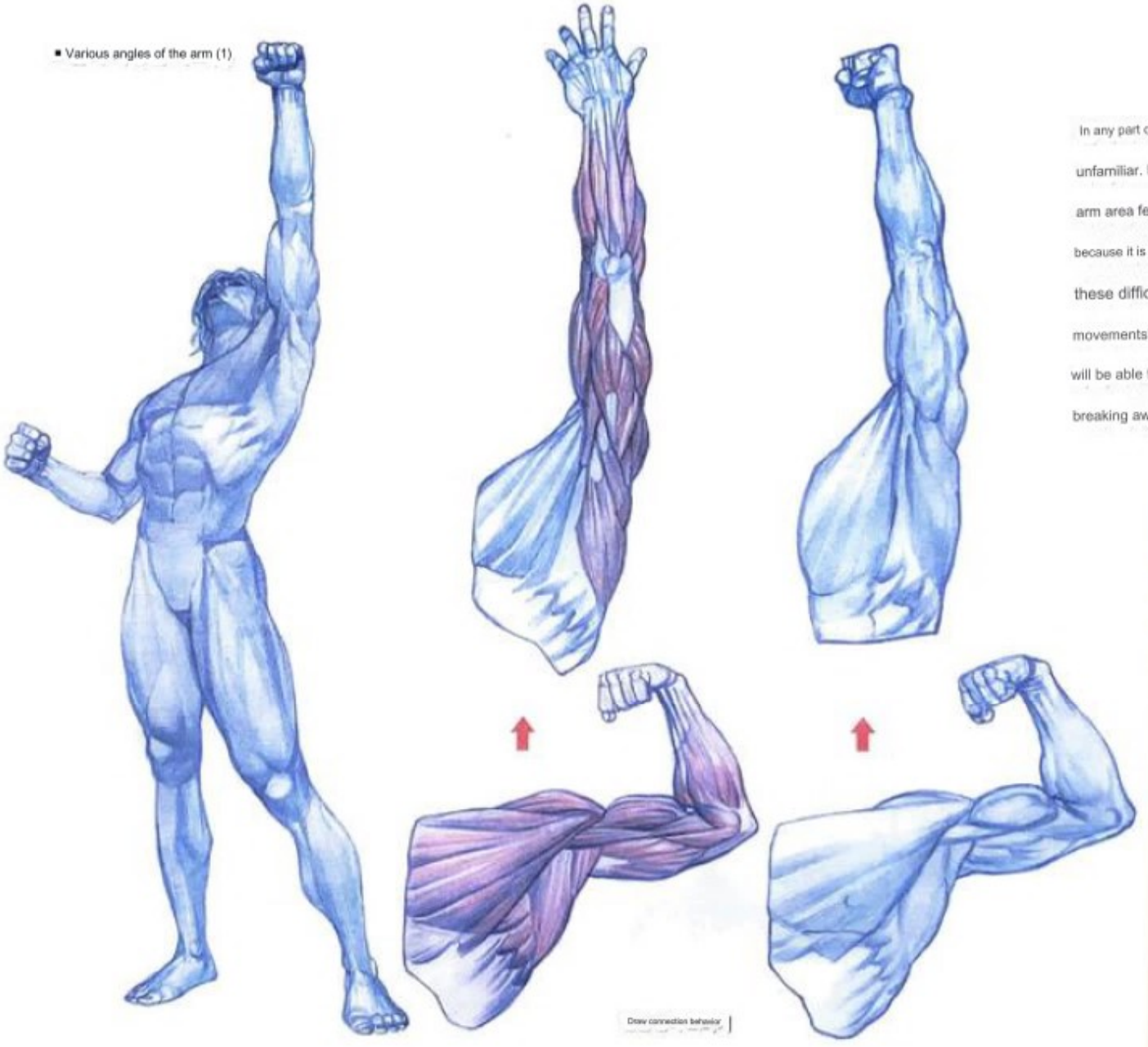




■ Shortened arm flow.

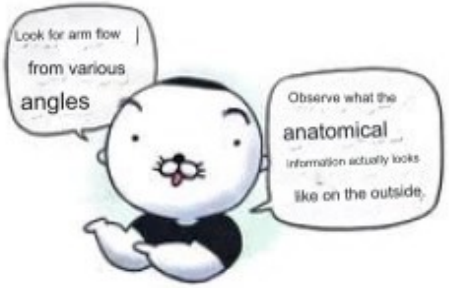
The entire body, especially the hands, has many muscles and joints concentrated there. This is for precise and complex work. The various muscles that move the fingers are connected to the arm, making the entire arm complex. The various branches of the arm muscles appear more prominent on the outside than other parts, so knowledge of arm anatomy is essential to draw the arm realistically. In particular, drawing an arm angled forward as shown above requires more information than the side angle. First, you need to know the correct perspective and the order in which muscles overlap, and you must be able to combine the thickness of the muscles in three dimensions to draw a shortened arm.

■ Various angles of the arm (1)



In any part of the human body, there is bound to be an angle that feels unfamiliar. Looking at the full-body character here, doesn't the raised arm area feel particularly difficult than other parts? This is probably because it is an area that is less frequently observed in daily life. To overcome these difficulties, we recommend practicing 'drawing connecting movements' and 'turning the angle' as shown in the picture on the box. You will be able to draw people from more diverse angles by breaking away from the angles and movements you habitually draw.

| •Various angles of the arm (2)

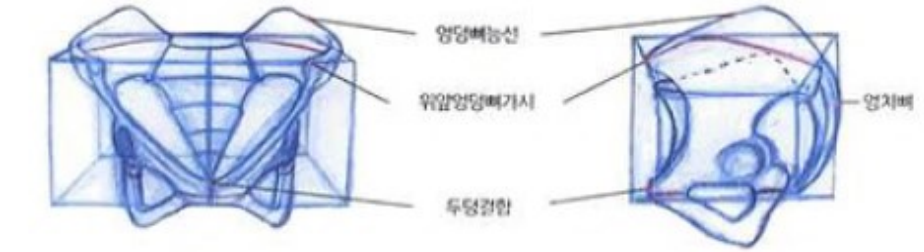


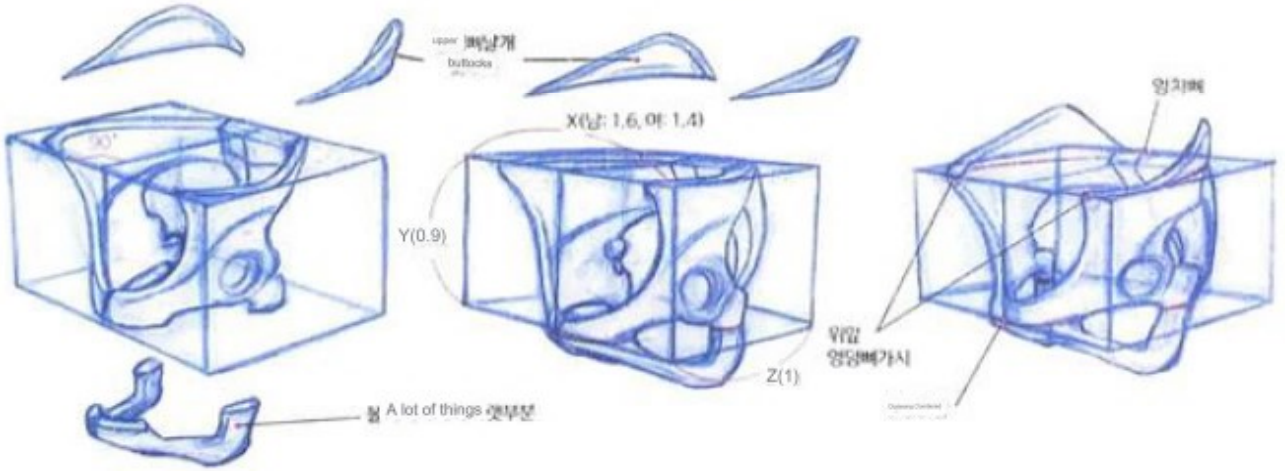
5 Location and use of leg muscles

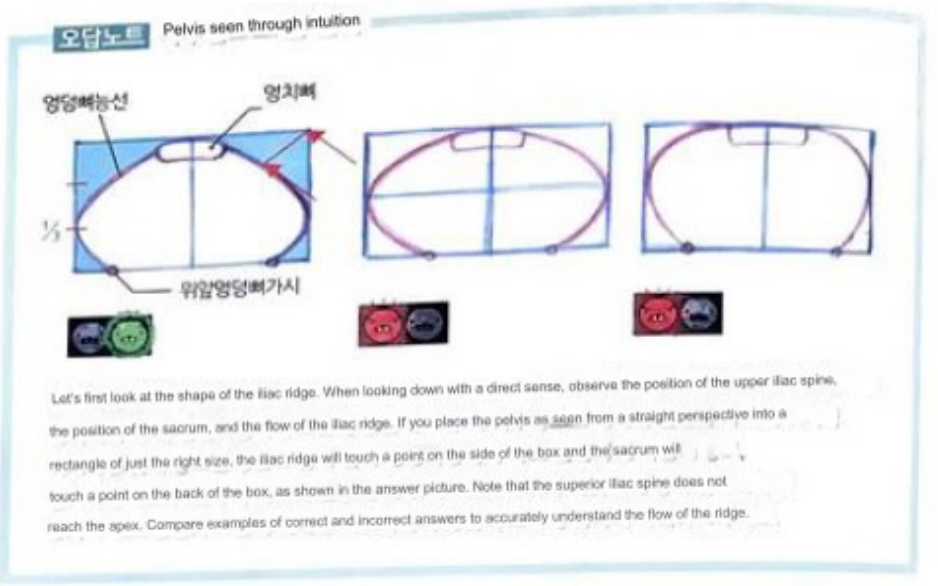
■ Pelvis in a box

Important parts of the pelvic bone

Let's learn about the pelvic bone, which is notorious for being the most complex of the human skeletons. As we learned in Chapter 1, 'Human Figure Drawing,' the more complex the shape is, the easier it is to simplify it into a shape to understand the structure. Among the pelvic bones, the part that reveals its external shape is probably the most important. The iliac ridge, superior anterior iliac spine, cephalic symphysis, and sacral region are the areas that come into contact with the skin and affect the external shape. If you properly understand the location and shape of these four parts, you do not need to know the rest of the pelvis in such detail.







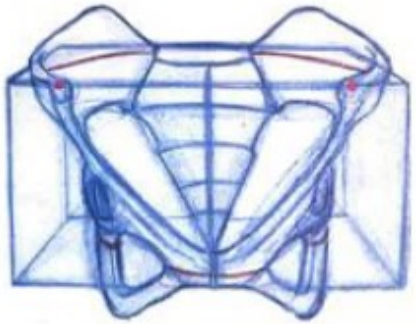
Let's first look at the shape of the iliac ridge. When looking down with a direct sense, observe the position of the upper iliac spine, the position of the sacrum, and the flow of the iliac ridge. If you place the pelvis as seen from a straight perspective into a rectangle of just the right size, the iliac ridge will touch a point on the side of the box and the sacrum will touch a point on the back of the box, as shown in the answer picture. Note that the superior iliac spine does not reach the apex. Compare examples of correct and incorrect answers to accurately understand the flow of the ridge.

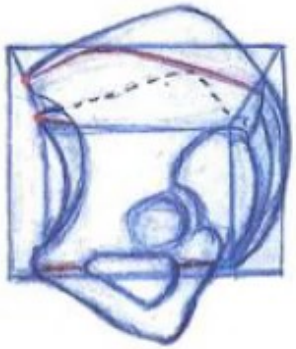
Drawing a pelvis based on a cube

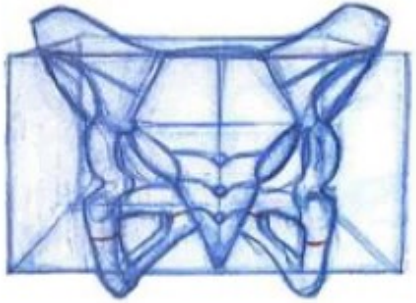
Length of Y: Height of the superior anterior iliac spine and the zygomatic symphysis Length of

As shown in the picture on the left, draw a box with the lengths of Complete the pelvis. It may seem complicated, but as I said before, the shape of the pelvis in contact with the skin is the most important, so please simplify and connect the remaining complicated parts.

The superior anterior iliac spine is the most prominent part of the pelvic bone.





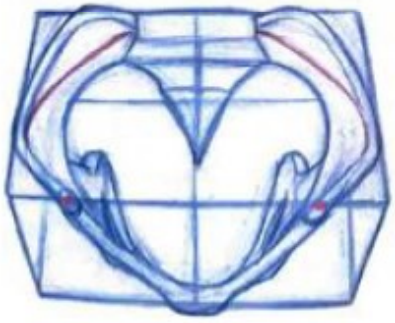


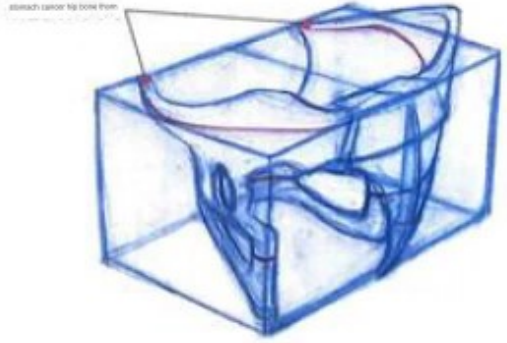
Pelvis from various angles

The previously mentioned point

Draw a box that is proportional to the center from several angles.

Once you can draw a cube with proper proportions, let's practice drawing the pelvis inside the cube centered on the point of the pelvis that touches the skin.

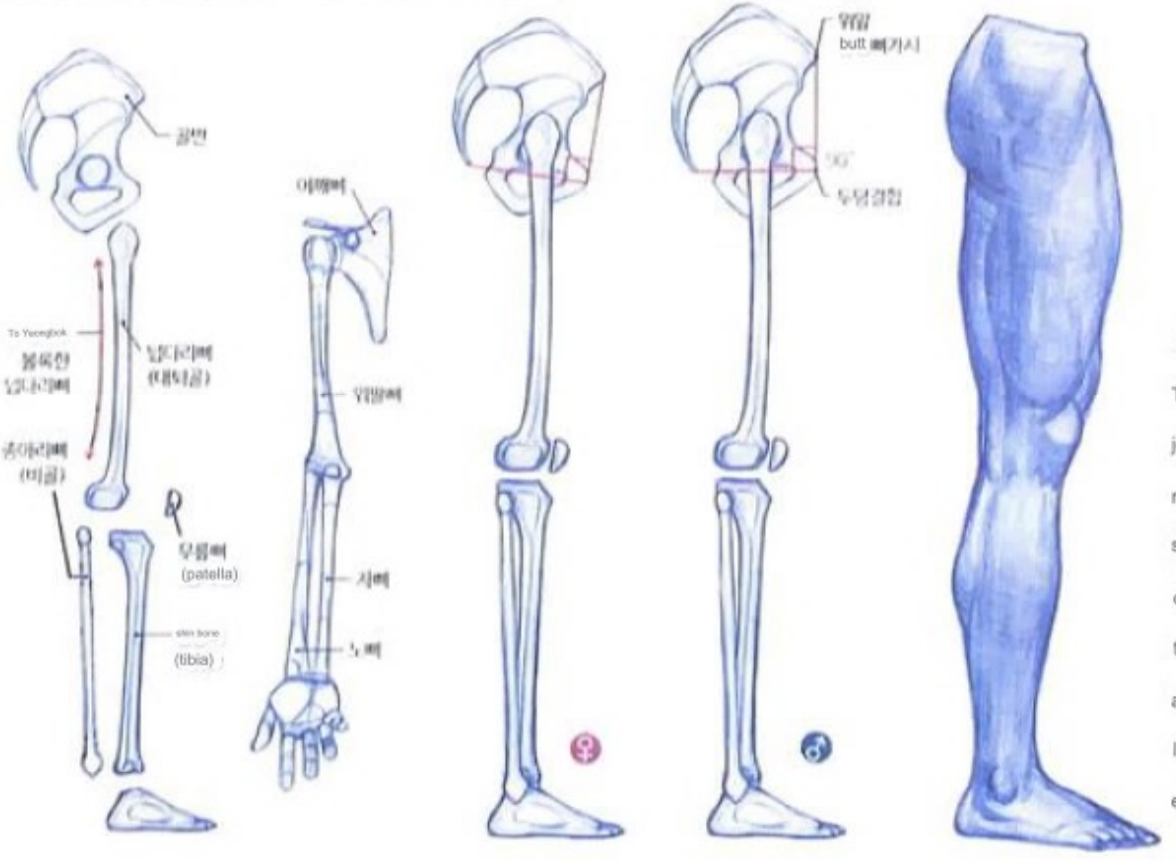


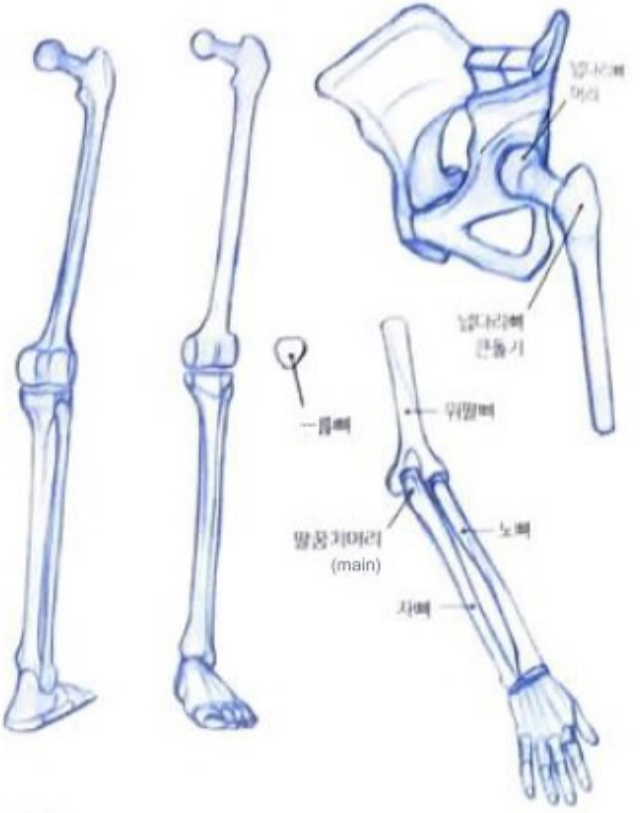


■ Types of leg bones that make up the lower body

Characteristics of leg bones (1)

The pelvis is divided into the legs, knees, tibia, and fibula. When viewed completely from the side, men have a pelvic tilt where the superior iliac spine and cranial symphysis are perpendicular to the floor, while the opposite sex has a pelvic tilt where the superior iliac spine is forward. Men's pelvic height is longer than women's. Also, when viewed from the side, the femur is characterized by being slightly convex toward the front rather than being straight. The calf area is divided into two bones, the tibia and the fibula, just as the forearm is divided into the ulna and lumbar bone. The wrist rotates as the nopi flips around based on the wisdom believed in, but the ankle has evolved a structure to support the weight of the jinshin, so the wrist does not rotate well.





Characteristics of the bridge (2)

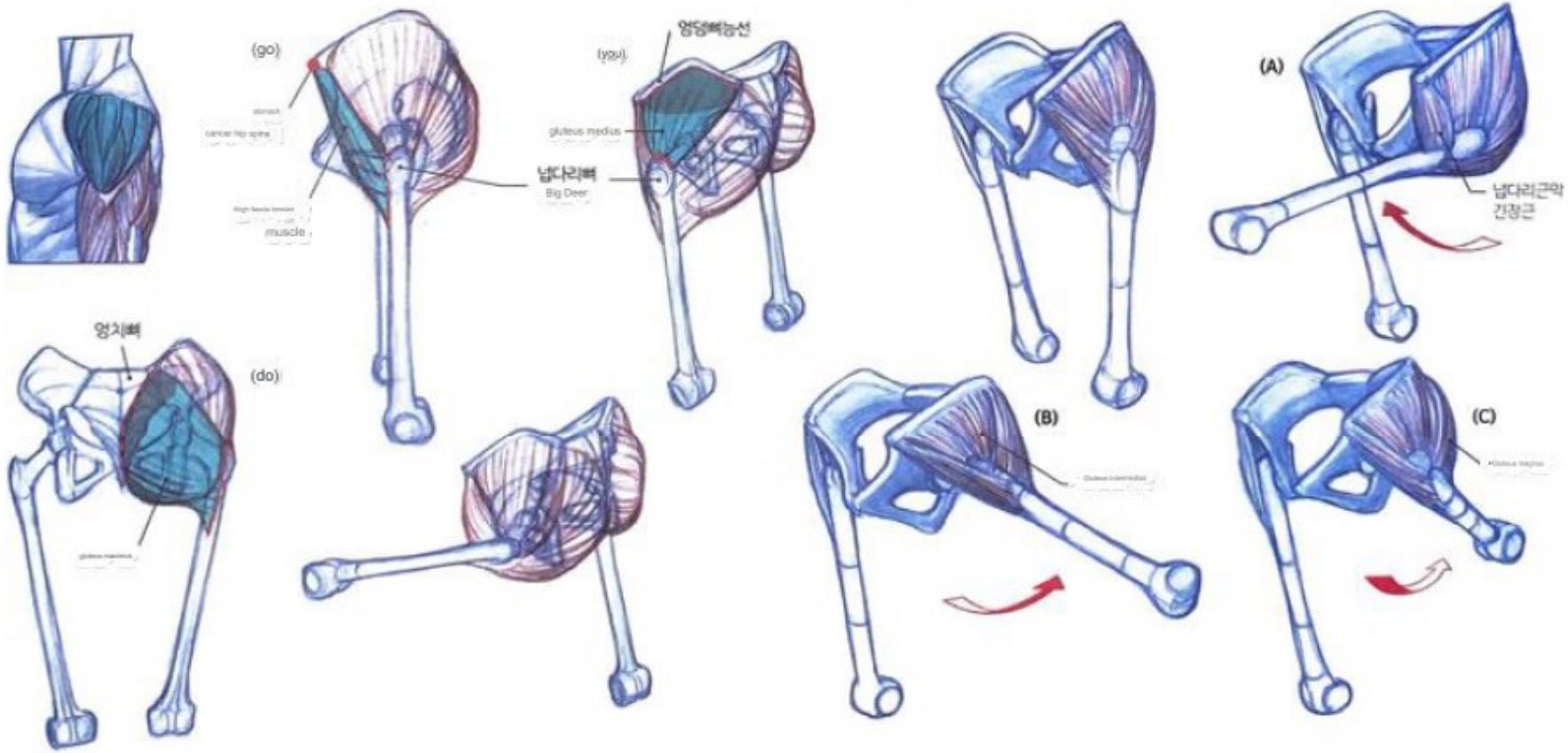
The femur head is the joint where the femur and pelvis meet. It is a ball joint that allows the most freedom of movement among joints. The reason why the large protuberance of the femur protrudes like a hump is so that the buttock muscles can attach to it. Since the arms, which were originally used as front feet, evolved from the legs, comparing and studying the arms and legs is very helpful in understanding. Arms and legs have a lot in common, but the kneecap is a bone found only in the legs. It has the same location as the elbow head. This kneecap acts as a lever to make it easier to move the heavy leg.

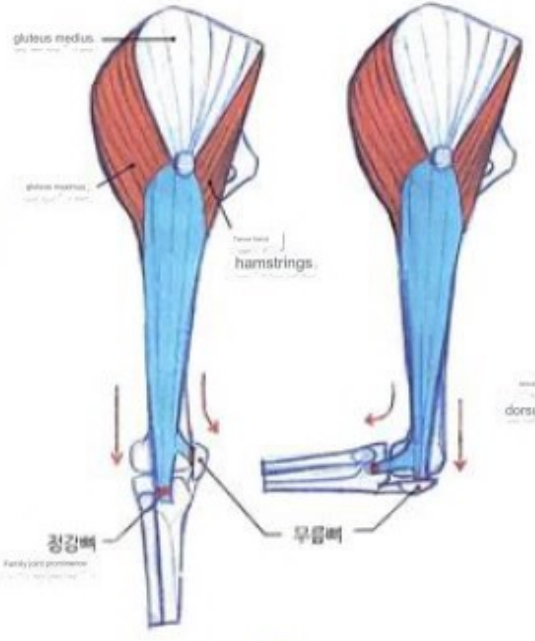
■ The tensor fascia latae (tensor fascia latae), gluteus medius (gluteus medius), and gluteus maximus muscles that spread the legs.

The hip muscles have the same function as the shoulder muscles in the arm. Like the shoulder muscles, the hip muscles are divided into three. The picture below (a) shows the tensor fascia latae, located on the front of the hip, starting from the superior iliac spine and ending at the area of the greater protuberance of the femur. The gluteus medius muscle in Figure (B) is toward the side of the hip, and starts from the iliac wing area along the iliac ridge and attaches to the greater process of the femur. Figure (c) shows the gluteus maximus muscle attached to the back of the hip. It starts from the sacrum and attaches to the area behind the greater process of the femur.

Use

The hip muscles are responsible for moving your legs forward, backward, and sideways. When the tensor fascia of the thigh muscle in Figure (A) contracts, the thigh bone rises forward. These muscles greatly influence the expression of flow connecting the pelvis and thighs. When the gluteus medius muscle in Figure (B) contracts, the femur moves up to the side, and finally, when the gluteus maximus muscle in Figure (C) contracts, the thigh bone moves up backwards. The gluteus maximus muscle is the largest of the three muscles because it lifts the body upward or pushes it forward.





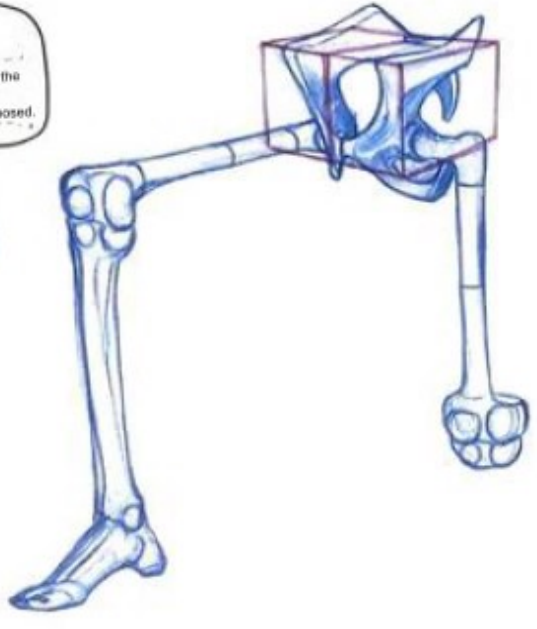
Myungmyeong skin belt

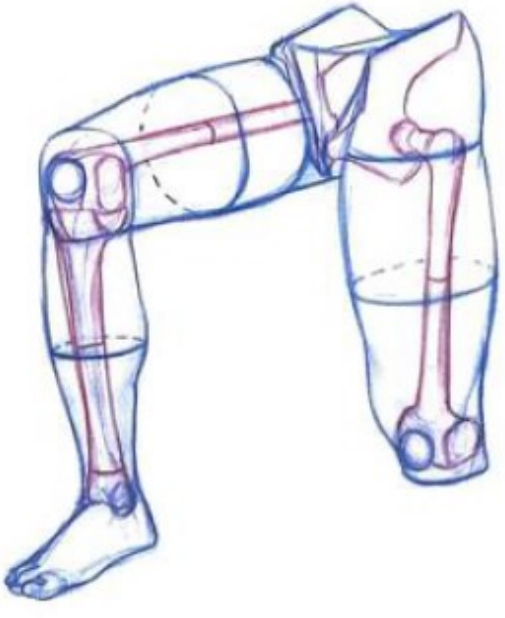
Previously, the gluteus maximus and tensor fascia latae were simplified and expressed as if they were attached to the thigh bone, but in actual anatomy, these two muscles turned into a tendon called the iliac tibial girdle and extended down toward the joint prominence of the kneecap and tibia. It sticks. Between the iliotibial band and the femur, there is a muscle called the latissimus familial muscle. Each time you bend and straighten your knees, the direction of the end point of the hip band changes. Observe the change in the picture on the left. This part is visible even outside the skin, so it is a description that cannot be missed. The gluteus medius muscle attaches directly to the greater process of the femur. Since the greater protuberance of the femur is not covered by muscle, it is in close contact with the skin and is a visible indicator, and the outline of the bone can be felt with the hand. Another characteristic is that men can be touched more clearly than women.

Points of visible thighs

The red dots in the picture mark the end points of the greater femoral protuberance and the iliac tibial band. The circled dotted area shows the direction of the special fold that crosses the muscle over the tensor fascia latae when the leg is flexed.


The volume of the legs
through the skeletal shape and geometry
of the lower body. Let's observe how the
muscles located in the pelvis are exposed.



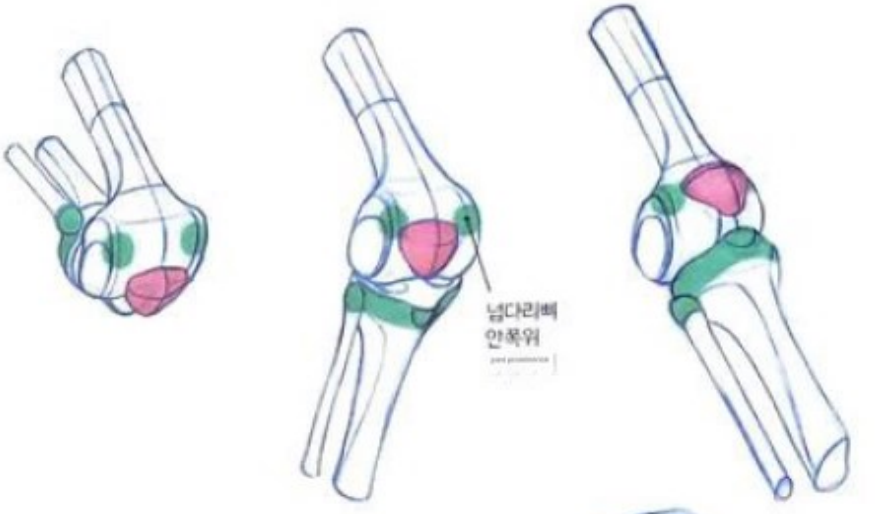


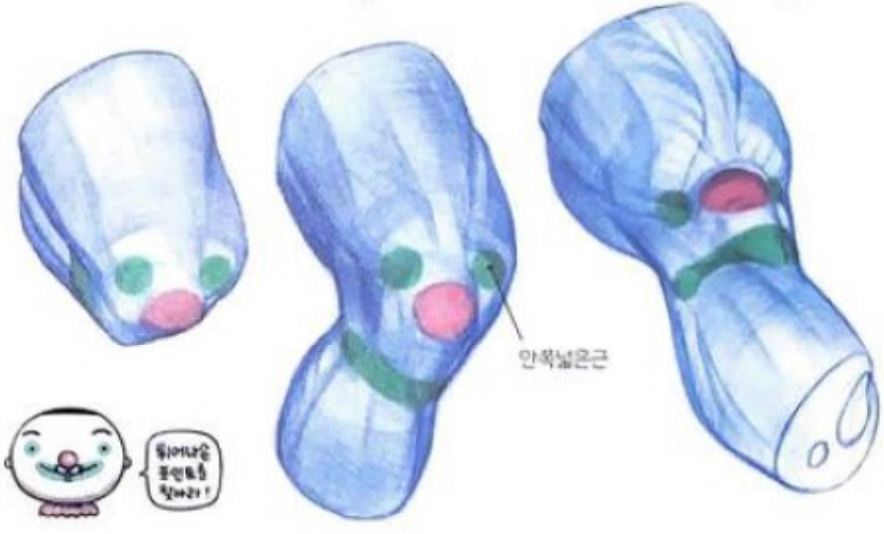
■ The structure of the kneecap changes with movement

Relationship between kneecap and tibia

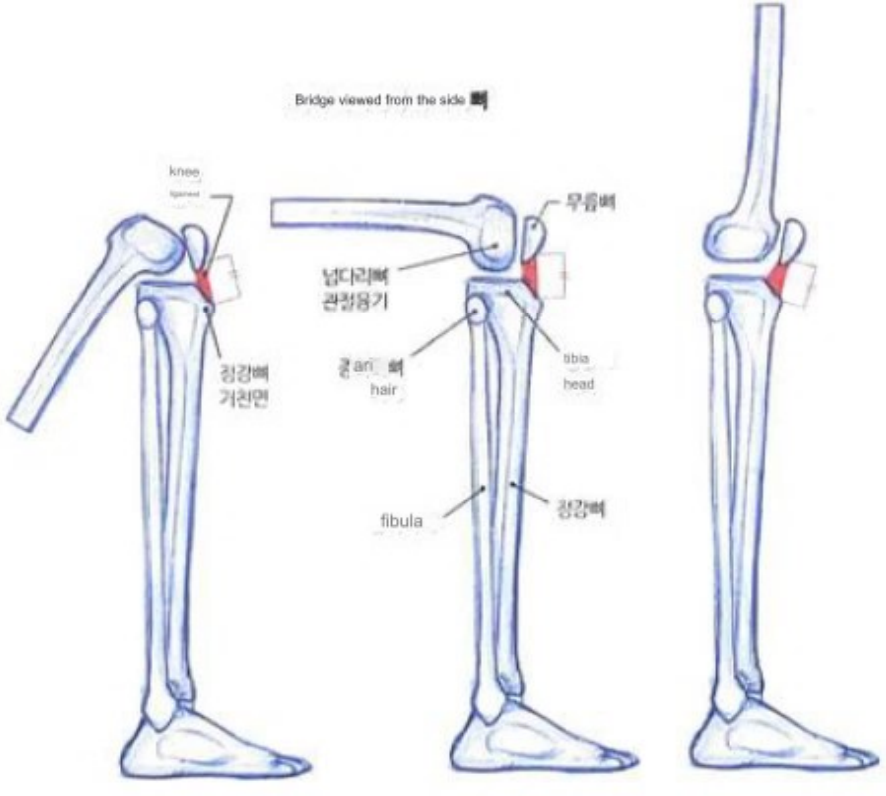
The reason why the femur joint is bent backwards in the shape of a golf club is to create space so that the femur and tibia do not touch as much as possible when the knee is bent. The femoral condyle is a convex joint and the tibial head is a concave joint. The kneecap is the cause of the change in shape whenever the knee moves, and is connected to the rough surface of the tibia by ligaments. Because ligaments cannot relax or contract, even if the knee moves, the distance between the kneecap and the rough surface of the tibia is always the same, as shown in the picture below.

If you look at the leg from the family side, the fibula is attached to the outer line of the tibia. The important thing about the fibula is that the head of the fibula is attached to the back of the knee, not in the center of the head of the tibia.





Bridge viewed from the side ■

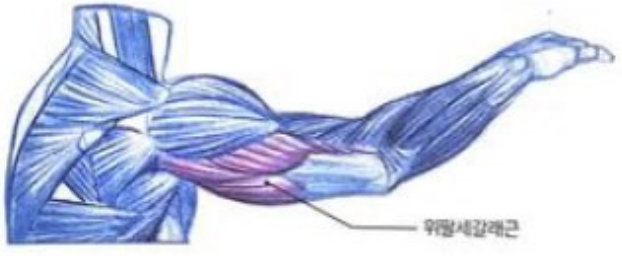


Knee shape according to posture

The shape around the knee is greatly influenced by the bone. If you know exactly the position of each bone according to the degree of knee bending, you can create and draw the shape of the knee that suits each posture without any data. The vastus medialis muscle covers the upper joint prominence on the inside of the thighbone, so it protrudes more than the volume of the bone. The more developed the vastus medialis muscle is, the more this area protrudes.

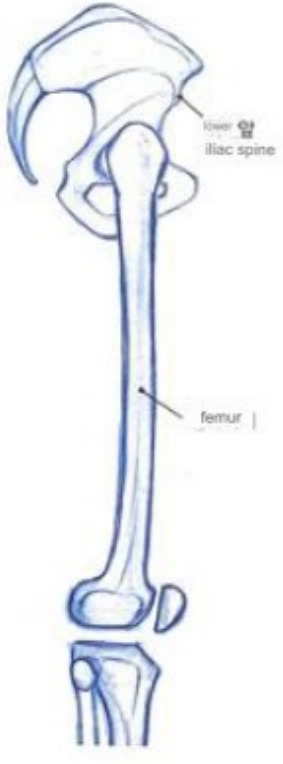
■ Muscles of the front of the thigh (rectus femoris, latissimus medius, latissimus medialis, scalene femoris)

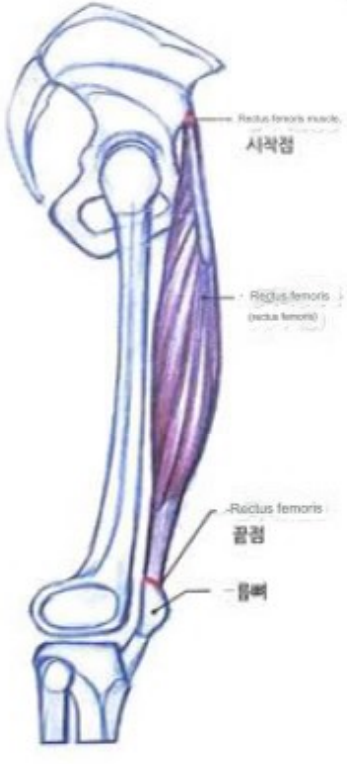
The rectus femoris muscle, located at the front of the thigh, and the rectus femoris muscle, the largest muscle in the lower body

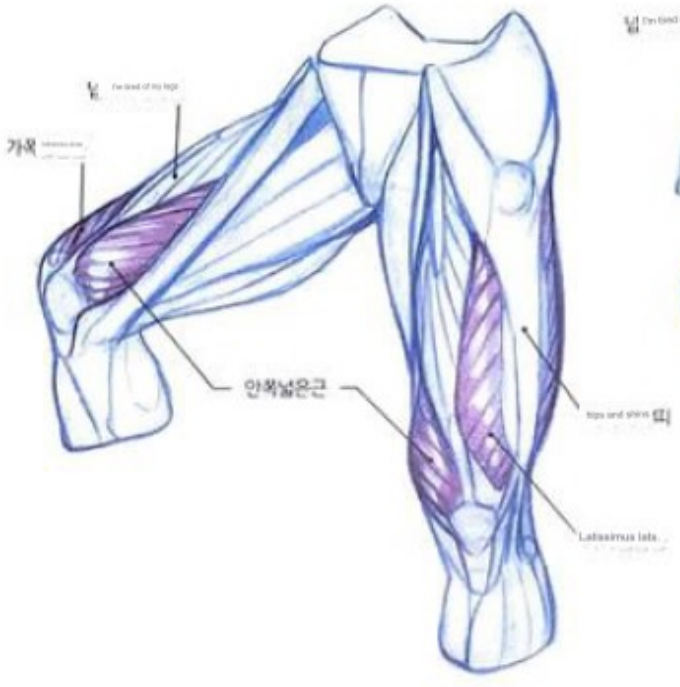


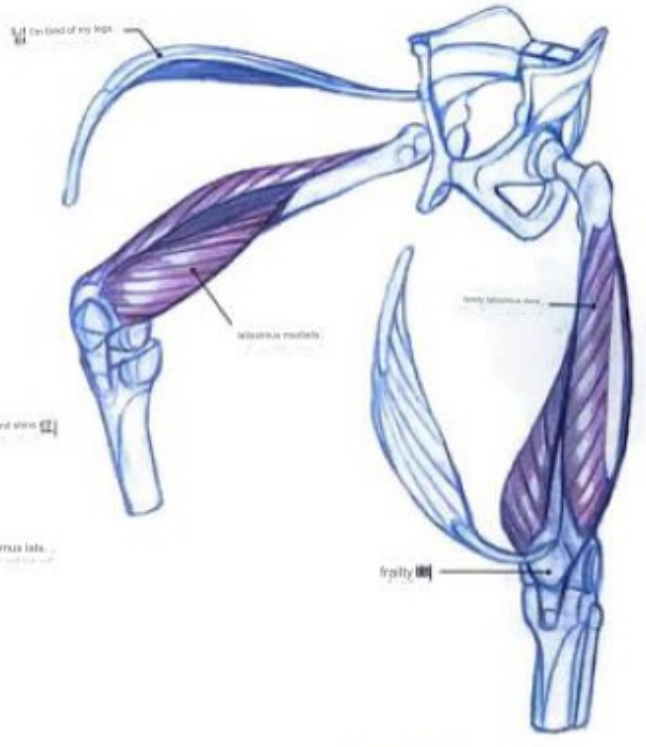
The muscles in the front of the thigh are used to straighten the knee. Compared to the arm, it plays the same role as the quadriceps brachii muscle, which allows the arm to be fully extended. If you look at the thigh from the outer side, the rectus femoris and latissimus hamstrings are on the front of the thigh. The rectus femoris muscle originates from the lower anterior iliac spine and attaches to the kneecap. This is the muscle that appears most prominently when you look at the thigh from the front. Next, the latissus familial muscle begins along the familial side of the femur, travels to and attaches to the patella. The latissus familialis appears small from the front, but when viewed from the side, it occupies a large area and volume of the thigh and is actually the largest muscle in the lower body.

The outward protruding flow seen in the developing leg of an athlete is created by the latissimus familial muscle.









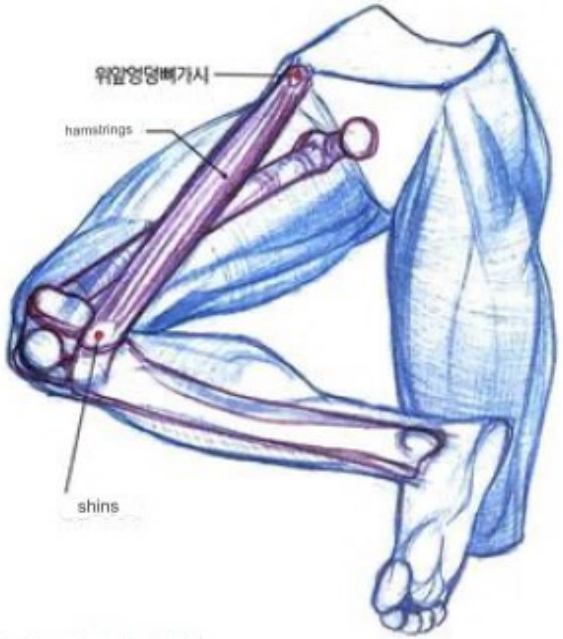
Three muscles attached to the kneecap

If you look at the thigh from the inner side, the latissimus medialis and rectus femoris are facing the front of the body.

•The rectus femoris was discussed earlier. Let's only look at the positional relationship with the latissimus medialis muscle.

The vastus medialis originates from the inner line of the femur and attaches to the kneecap. In summary, the muscles that stand out on the front of the thigh are the rectus femoris. Family broad muscle. There are three, including the vastus medialis, and although the starting point of each muscle is different, the end point of each muscle is the same, the kneecap. Looking at the picture above, the vastus medialis and vastus lateral muscles are directly attached to the femur, and the rectus femoris muscle covers them. Of these three muscles, the vastus medialis is the smallest in size, but it is attached close to the kneecap, so keep in mind that it has a great influence on the shape of the knee. If you look at the front view of the lower body on the right, the rectus femoris muscle is one of the three muscles relative to the kneecap.

The length of the tendon is the longest, and the inclination of the vastus medialis and the vastus familialis creates a V shape.

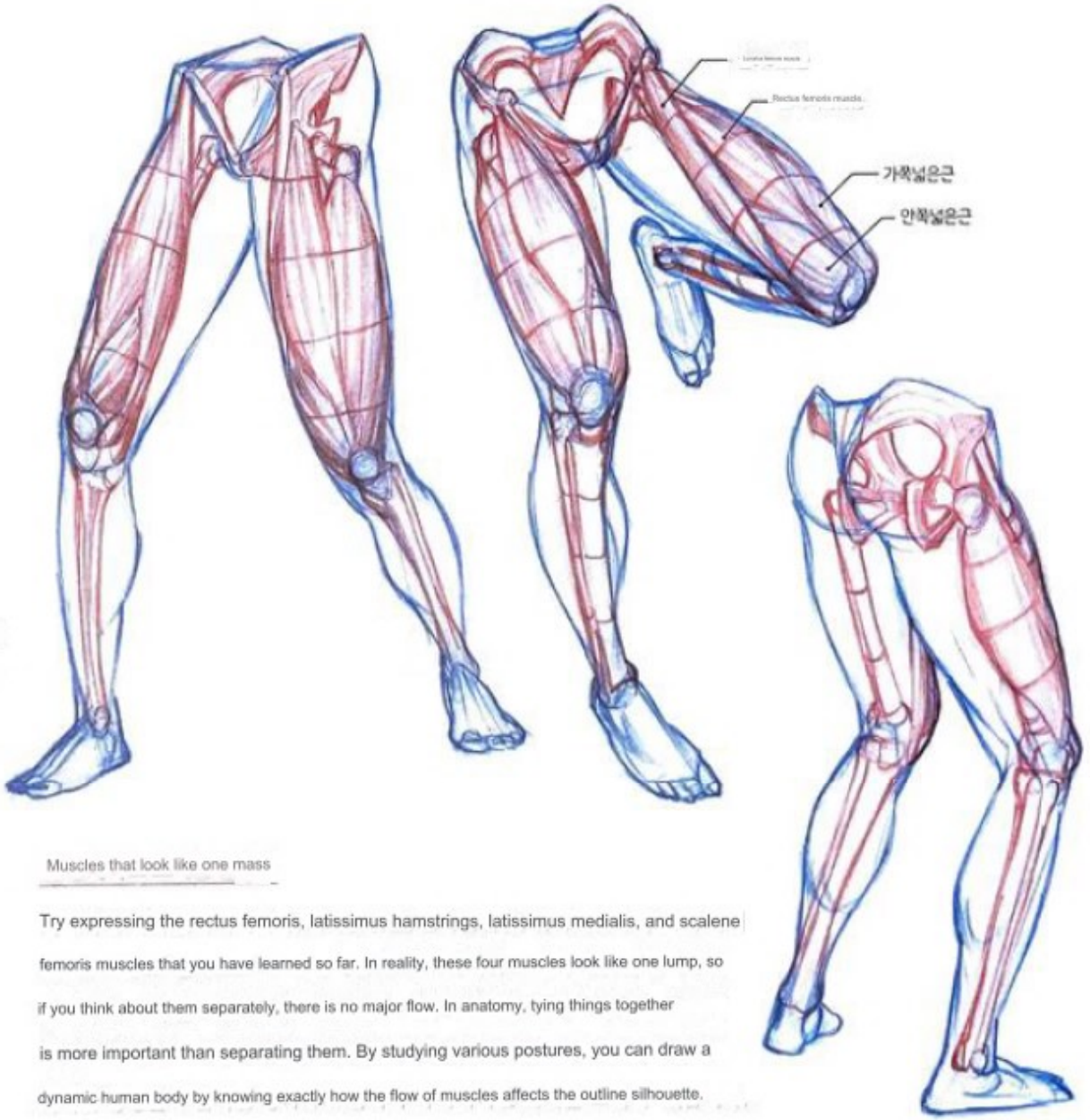


About the gastrocnemius muscle

The sartorius muscle visually divides the border between the front of the thigh and the inner thigh. Therefore, in order to accurately capture the flow of this boundary, you need to clearly know the location of the starting and ending points, right?

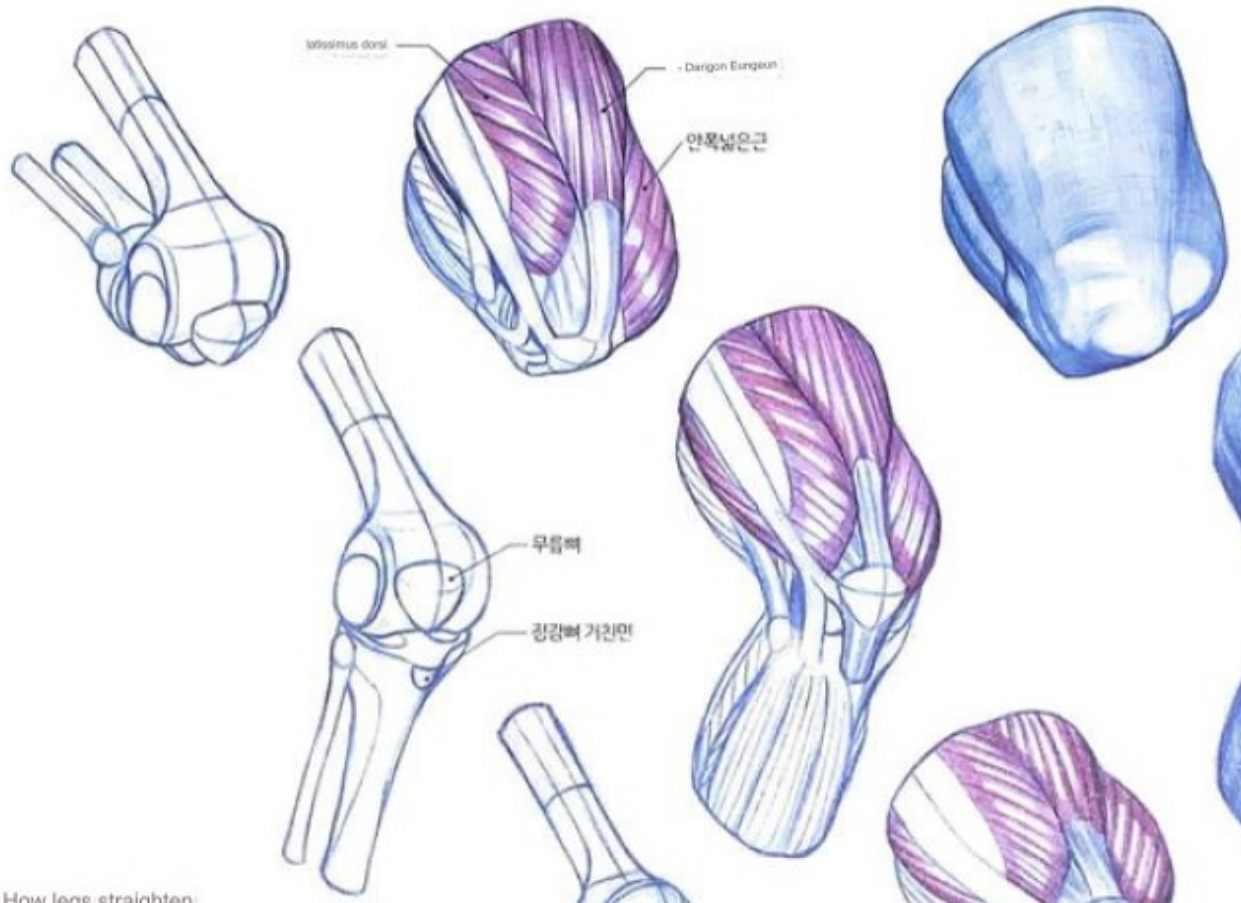
The gastrocnemius muscle originates from the superior anterior iliac spine and attaches to the inside of the tibial head.

This muscle plays the role of lifting the leg by turning it inward when taking the Jegicha posture, as shown in the picture below.



Muscles that look like one mass

Try expressing the rectus femoris, latissimus hamstrings, latissimus medialis, and scalene femoris muscles that you have learned so far. In reality, these four muscles look like one lump, so if you think about them separately, there is no major flow. In anatomy, tying things together is more important than separating them. By studying various postures, you can draw a dynamic human body by knowing exactly how the flow of muscles affects the outline silhouette.



On this page, we will learn how the complex shape of the knee is created by bones and muscles, and we hope that through this, you will feel the need to study anatomy at least a little.

How legs straighten

As mentioned earlier, rectus femoris. Family broad muscle.

The vastus medialis attaches to the kneecap,

and the kneecap is connected to the rough surface of the tibia by

ligaments. When these three muscles contract, they pull the

kneecap up, which in turn only lifts the tibia. The action of straightening the

knee when kicking a ball or taking a step is caused by contraction of the

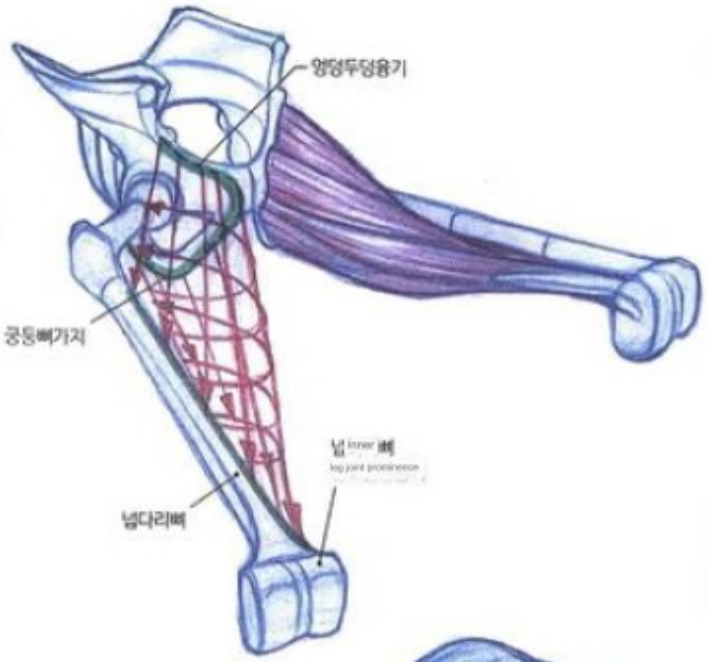
frontal thigh muscles, as shown in the picture.

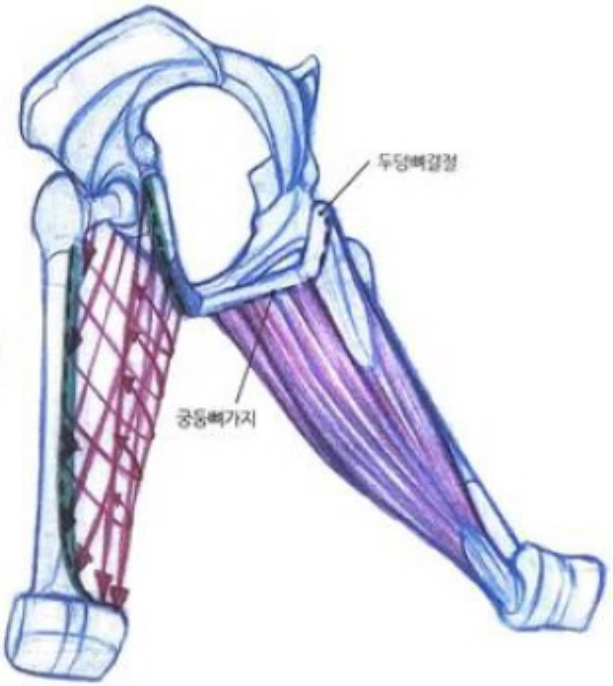
■ Gather muscles that bring the legs together (adductor group)

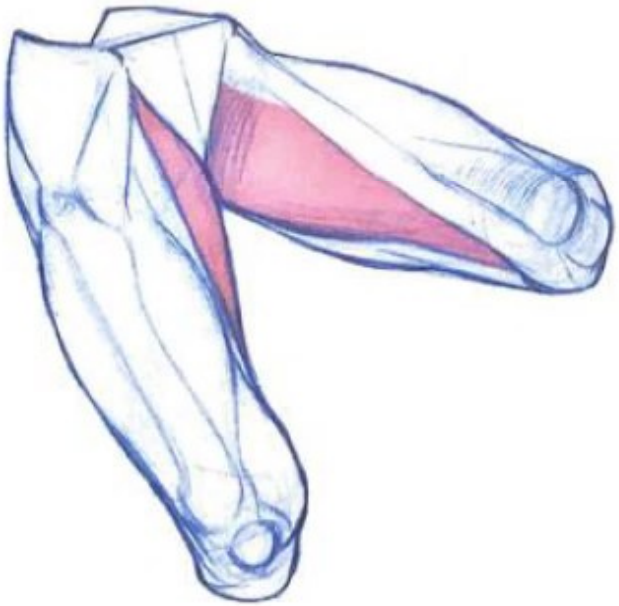
starting point and ending point

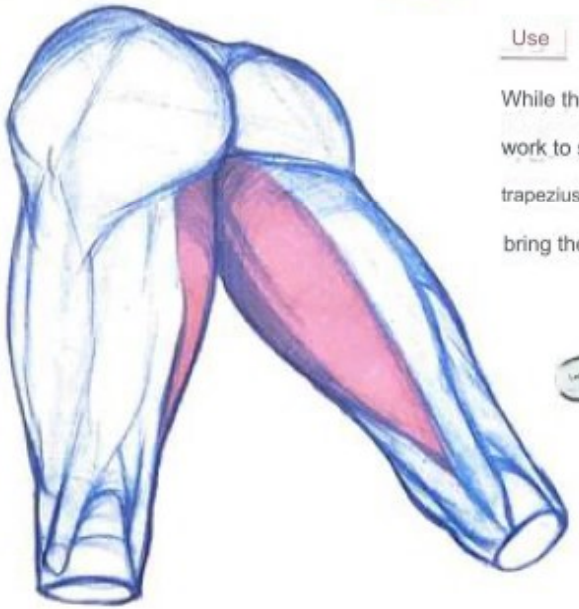
The leg trapezius muscles are the large trapezius, tibialis capitis, and short trapezius muscles. This is the general term for the long vowel muscle and capitis muscle. Since these muscles look like one lump on the outside, I will group them together for easier understanding. The trapezius muscles are the iliac prominence and the capillary tuberosity. It starts from the ischial branch and connects and attaches long from the top of the femur to the medial joint prominence. Since it is a three-dimensional muscle that rotates from front to back,

A three-dimensional understanding is needed.









Use

While the hip muscles learned earlier work to spread the legs outward, the leg trapezius muscles learned here work to bring the legs inward.

Legs vs. Hip Muscles
<Thigh Wrestling>

Leg muscles viewed from various angles

If we look at the reason why many students draw thighs poorly, it is often due to a lack of awareness of the leg trapezius muscles. Conversely, if you are too conscious of your leg trapezius muscles, your lower body will be drawn with excessive thickness. Rather than drawing the leg collection muscles with a rough idea. It requires in-depth study through croquis and anatomy.

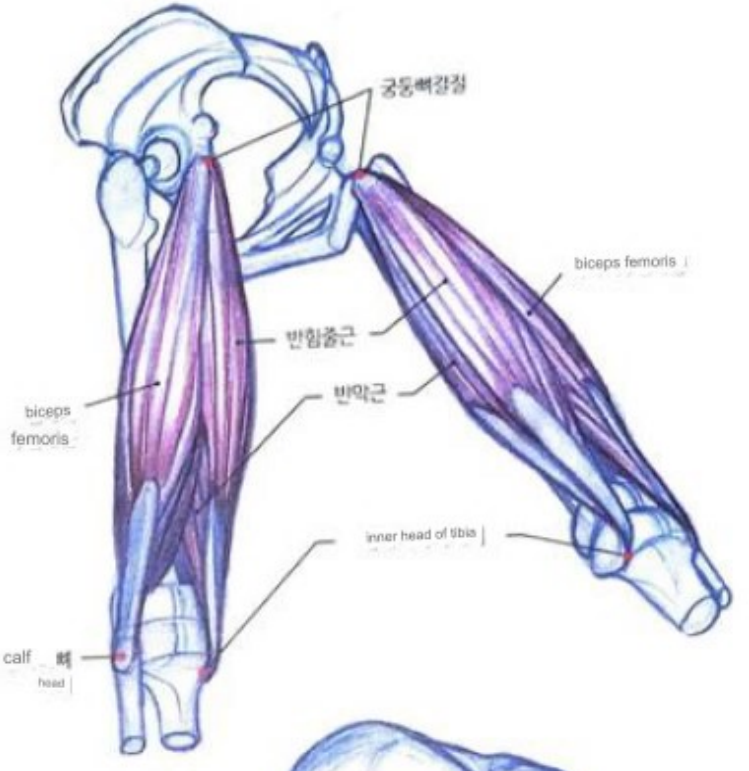
Observe how the leg trapezius muscles are expressed on the outside and how the angle affects the silhouette.

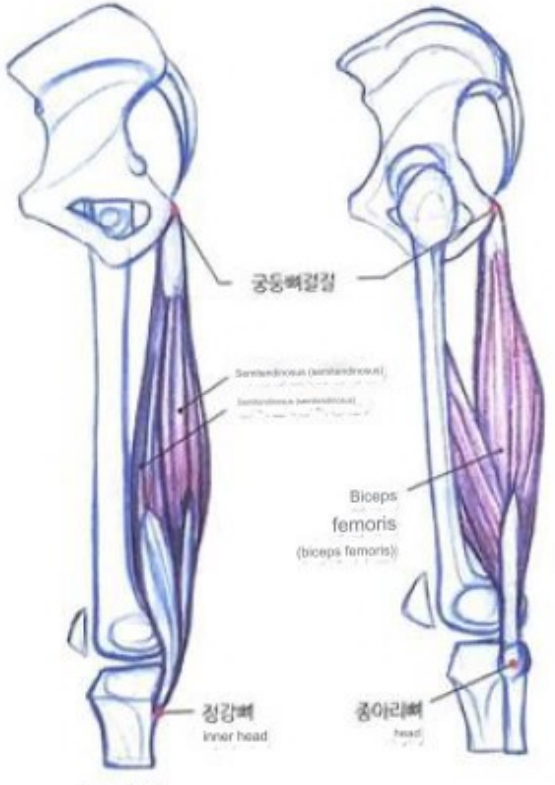
■ The muscles of the posterior thigh that bend the knee (biceps femoris, semimembranosus, and semitendinosus)

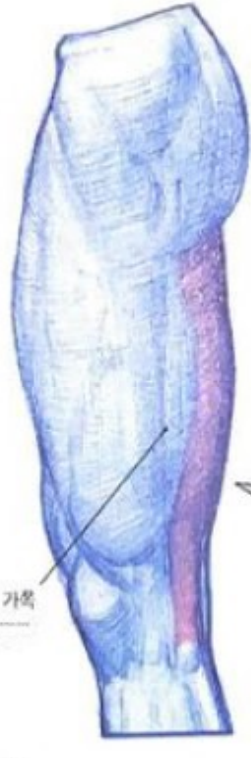
starting point and ending point

The back thigh muscle is the biceps femoris. It consists of the semimembranosus and semitendinosus muscles.

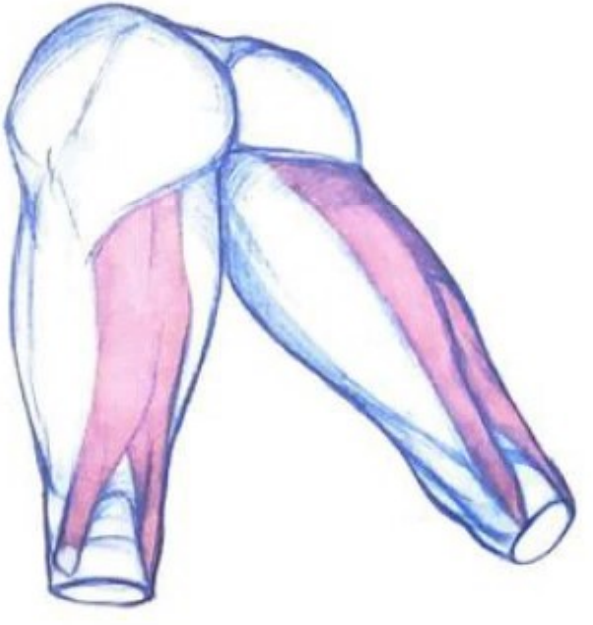
These three muscles all originate from the ischial tuberosity. The semitendinosus and semimembranosus are connected to the inner head of the tibia along the inner thigh line, and the semitendinosus is a structure that covers the semimembranosus. The end point of the biceps femoris muscle is the head of the fibula, which is the family thigh line. It starts from one point like this and splits into two at the end point, creating an ㅅ shape as shown in the picture on the right.





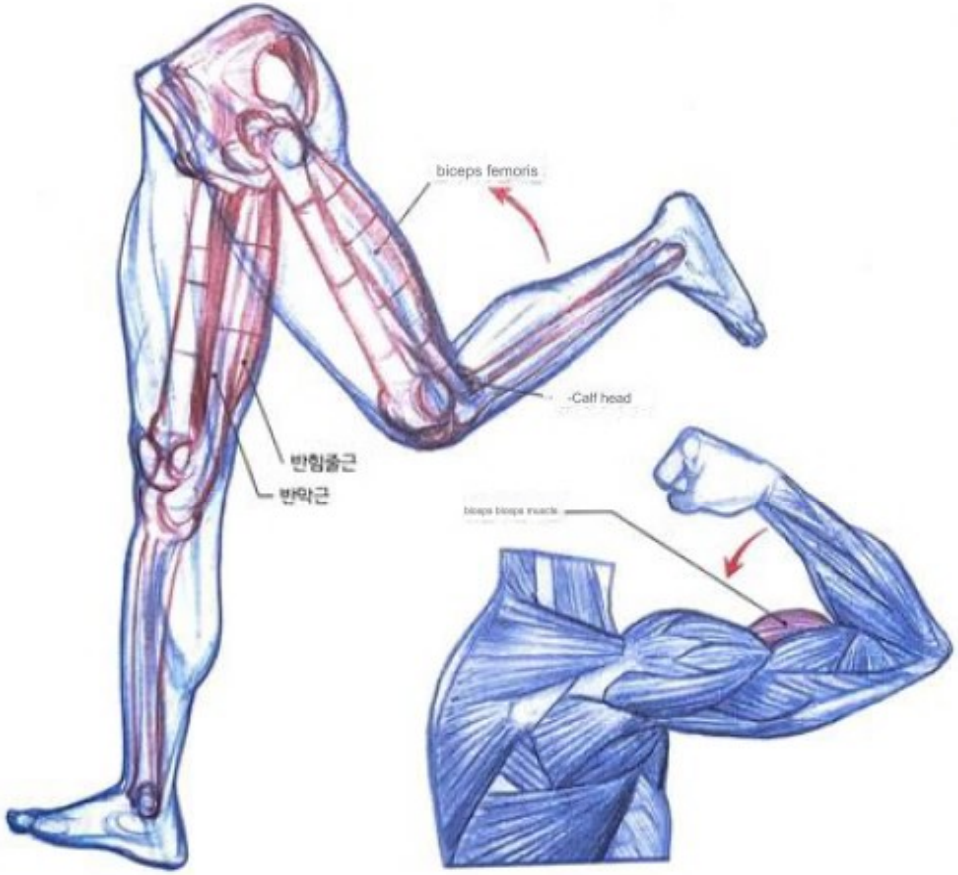


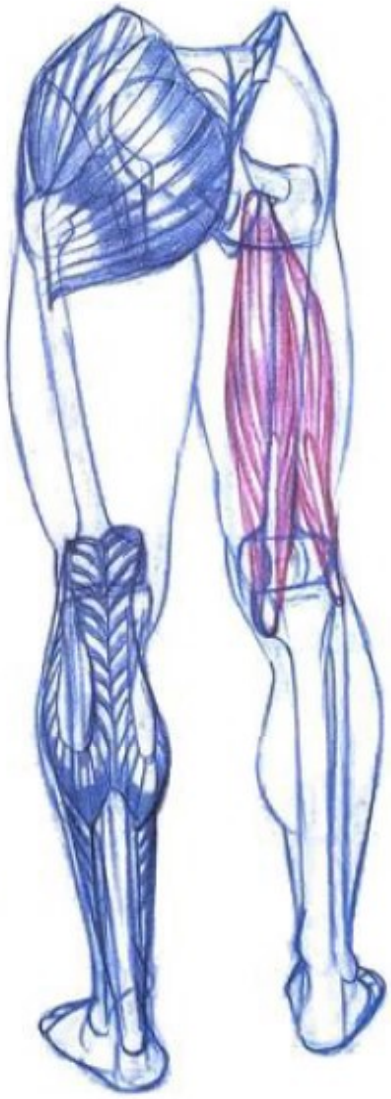
If you look at the leg from the lateral aspect, the latissimus femilis muscle obscures much of the area of the biceps femoris muscle. Therefore, compared to the actual size of the thigh biceps, only a portion of the area is visible on the outside.



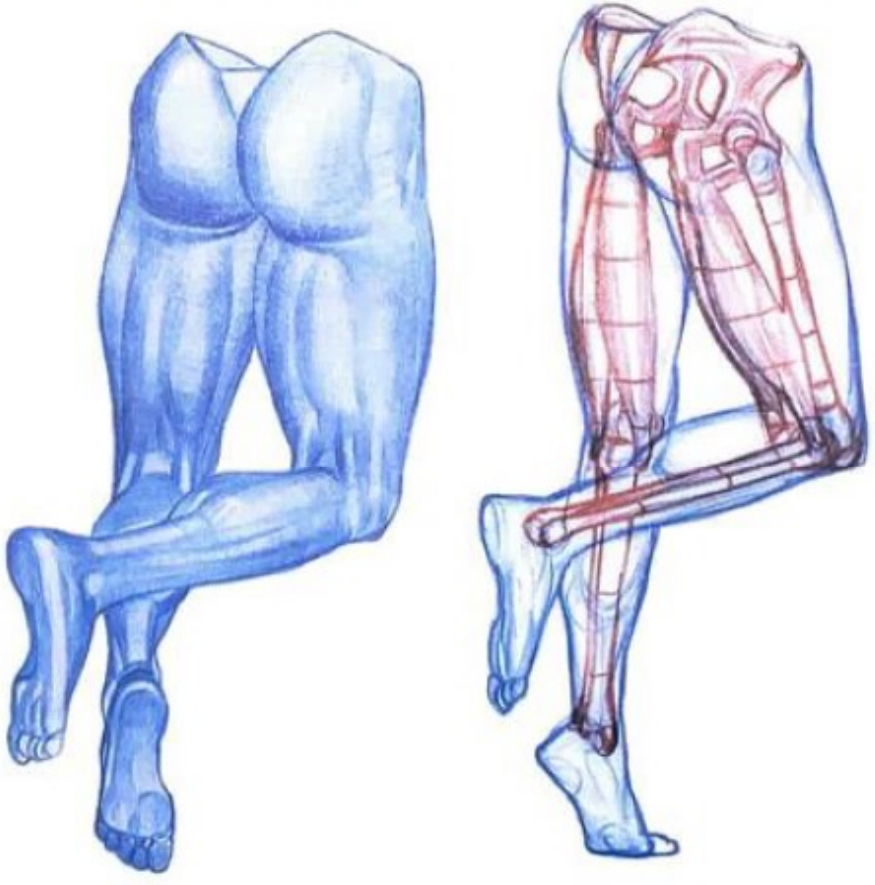
Use

The rear thigh muscles are 'flexors' that work the same way as the biceps brachii muscles of the arm. The biceps femoris, semitendinosus, and semimembranosus are used when bending the knee backward, and work in opposition to the muscles in the front of the thigh. The action of kicking the ground backwards when running, as shown in the picture below, is possible thanks to the muscles of the rear thighs.





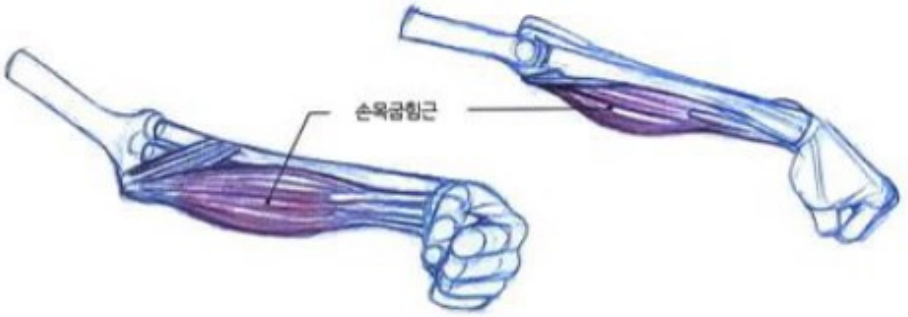
When expressing the biceps femoris and semitendinosus semimembranosus, the point is to draw the tendons protruding tautly behind the knee. In particular, the tendon point where the biceps femoris on the outside connects to the head of the fibula is clearly visible regardless of gender. Therefore, it is very important to accurately know the location of the fibula head and the direction of the biceps femoris tendon. As you look at the pictures on this page, take a close look at how when you bend your legs, the muscles in your back thighs are strained and split into two, and when you straighten your legs, because you don't have any strength, look closely at the phenomenon where they come together in one piece.

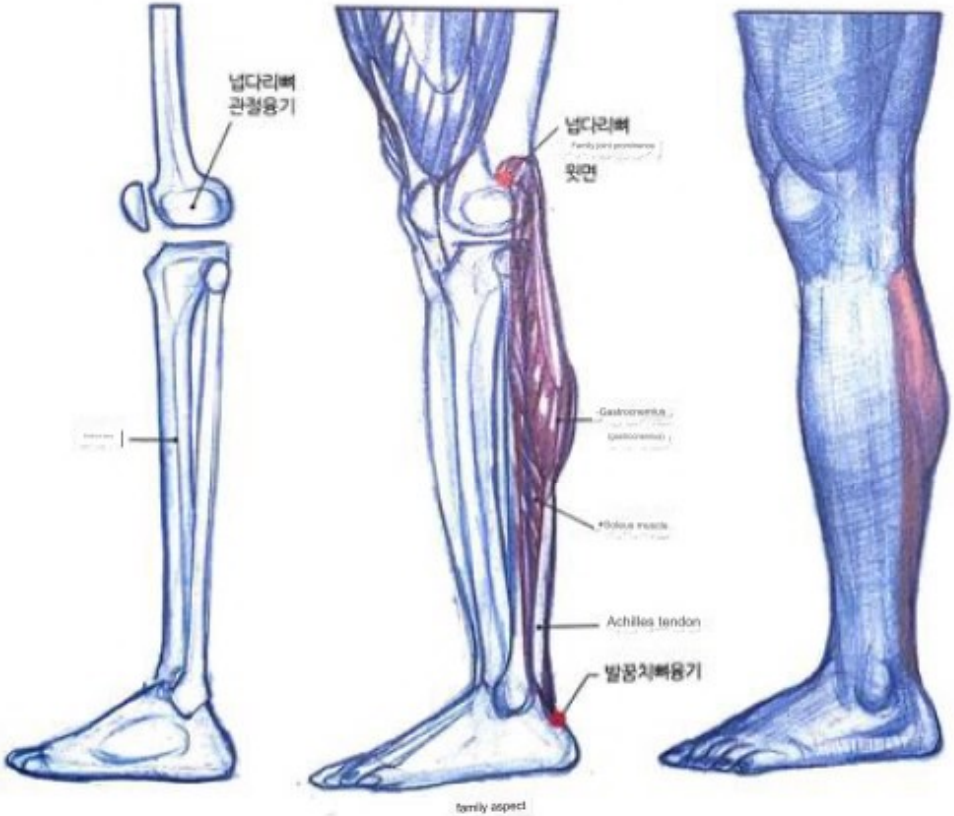


■Muscles on the back of the calf (gastrocnemius, soleus)

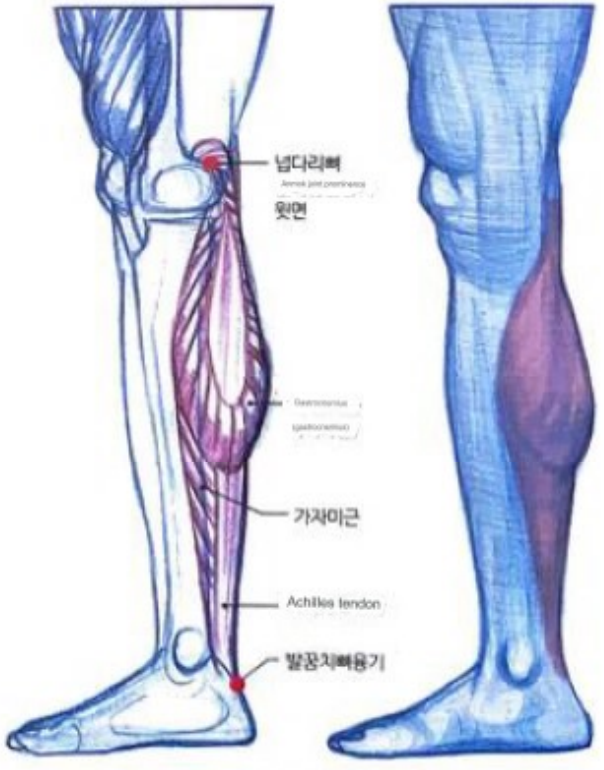
Compared to the arm, the muscles on the back of the calf, which play a similar role to the wrist flexors, have the soleus muscle attached to the tibia and the gastrocnemius muscle overlapping them. The gastrocnemius muscle is divided into two branches, each starting from the inside of the femoral joint prominence and the upper surface of the family, and turns into the Achilles tendon at about a point along the entire length of the gastrocnemius muscle.

The Achilles tendon attaches to the heel bone. Since the soleus muscle is mostly covered by the gastrocnemius muscle, only a little bit is visible on either side. We will learn more about this in Chapter 4 later.





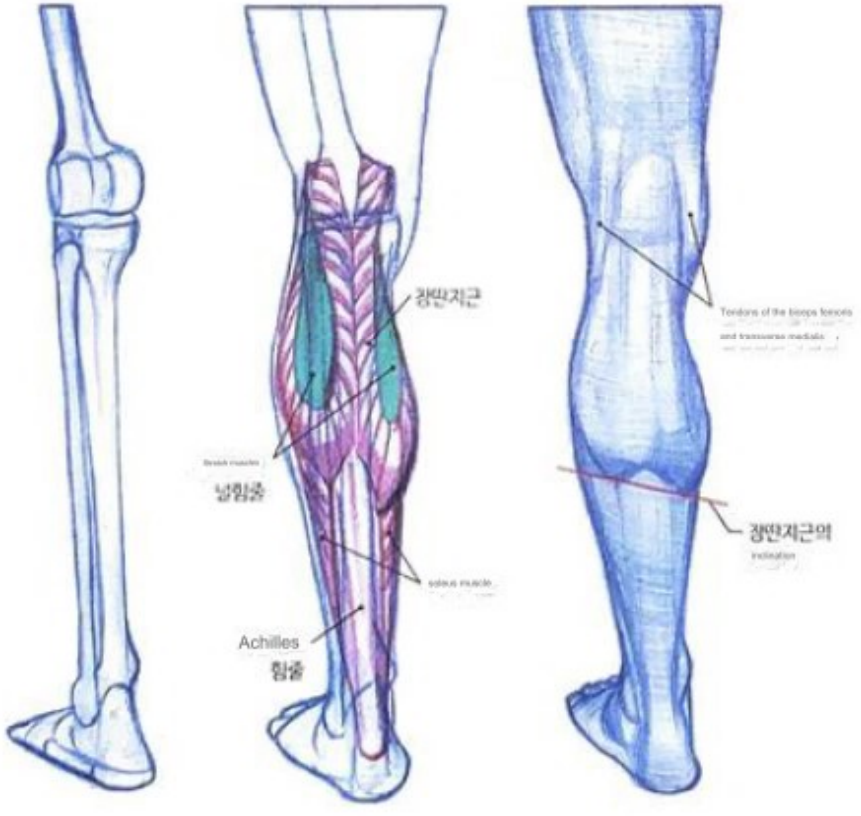
family aspect

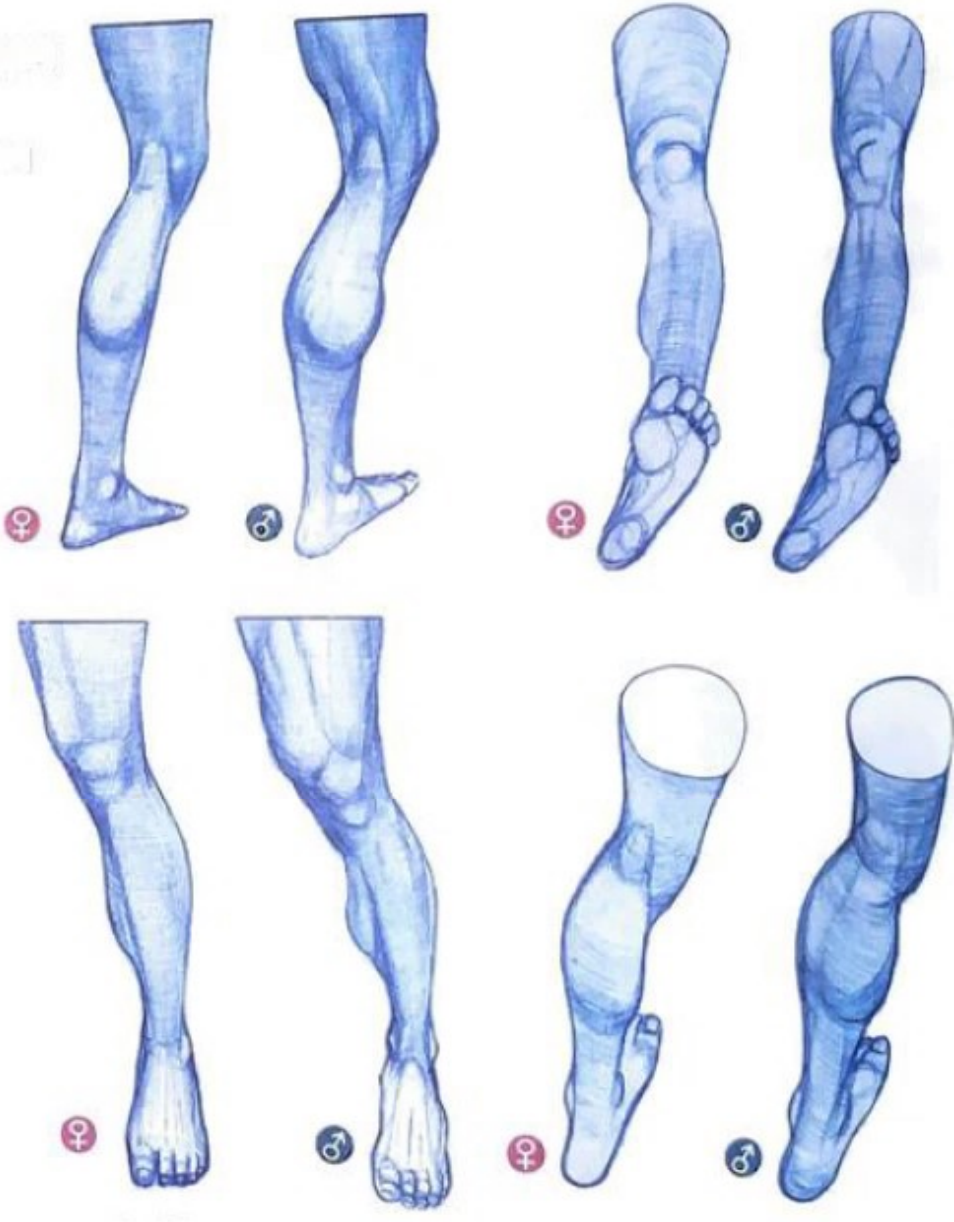


inner side

Features of the calf

You can see in the picture below the gastrocnemius muscle, which begins with the two branches mentioned earlier and merges with the soleus muscle at the Achilles tendon area. At the back of the knee, the upper part of the gastrocnemius muscle is dug in between the letter ㅅ of the biceps femoris muscle and the semitendinosus muscle. The area marked in green in the picture is the gastrocnemius tendon area. The tendon area is flat and the tendon area is thick and bulky, so observe the difference between the two shapes. Since the length of the inner gastrocnemius muscle is longer than the gastrocnemius muscle, this slope must always be expressed in order for the flow of the calf to be natural. It is difficult to express the calf area because the flow varies depending on the angle. By accurately understanding both the curve of the bone and the flow of the calf muscles, you can express the various flows of the calf depending on the angle.



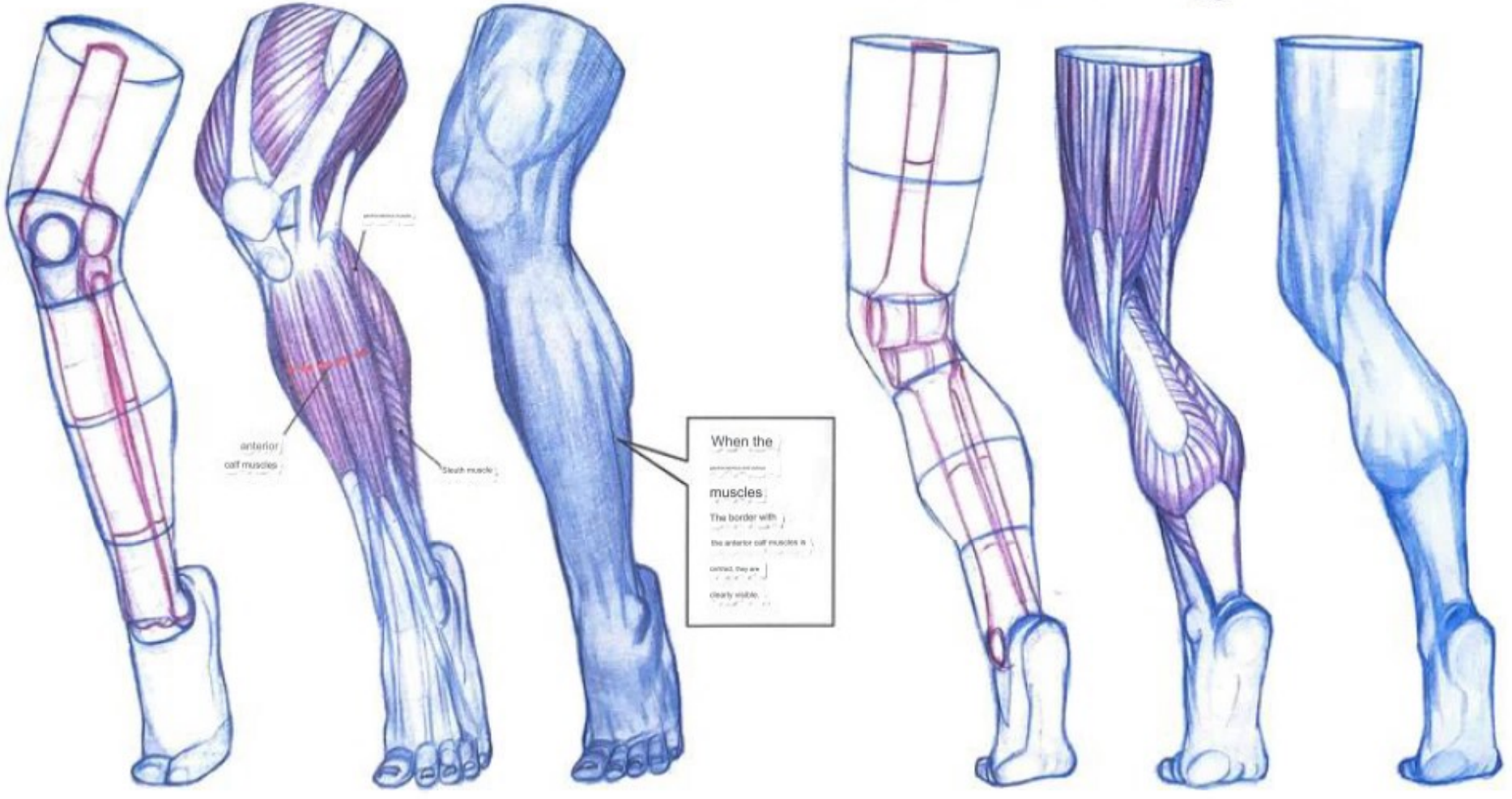


Let's observe the differences in shape due to muscle mass between men and women from various angles.

Use

When the gastrocnemius and soleus muscles contract, the heel is pulled upward, creating a tiptoe posture.

This is a muscle used in most basic movements, such as jumping, walking, and running.



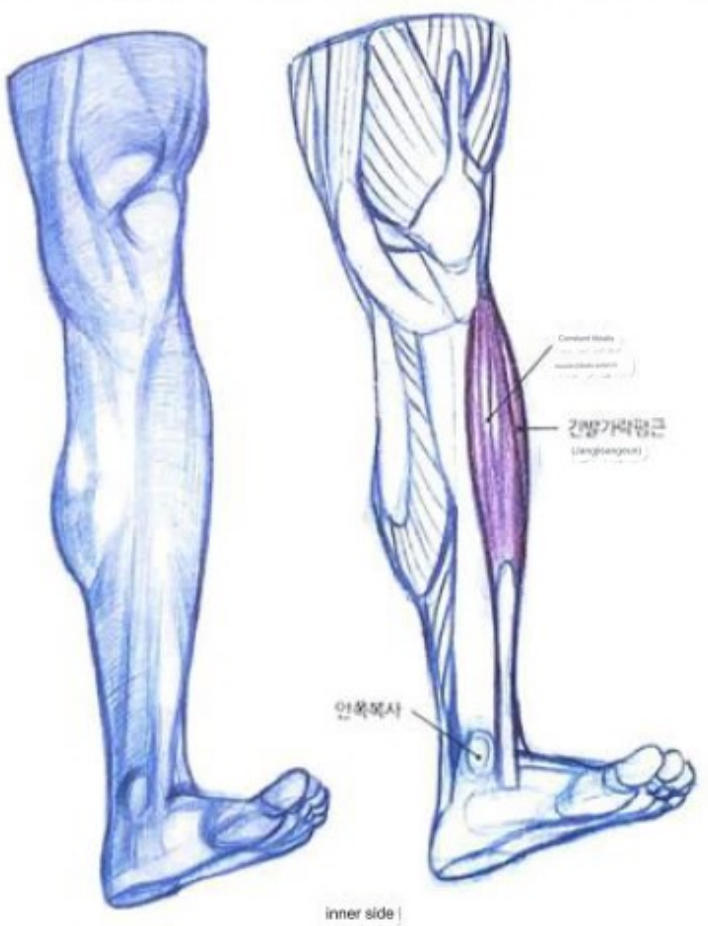
■ Muscles in front of the calf (tibialis anterior, flat toes longus, peroneus longus)

starting point and ending point

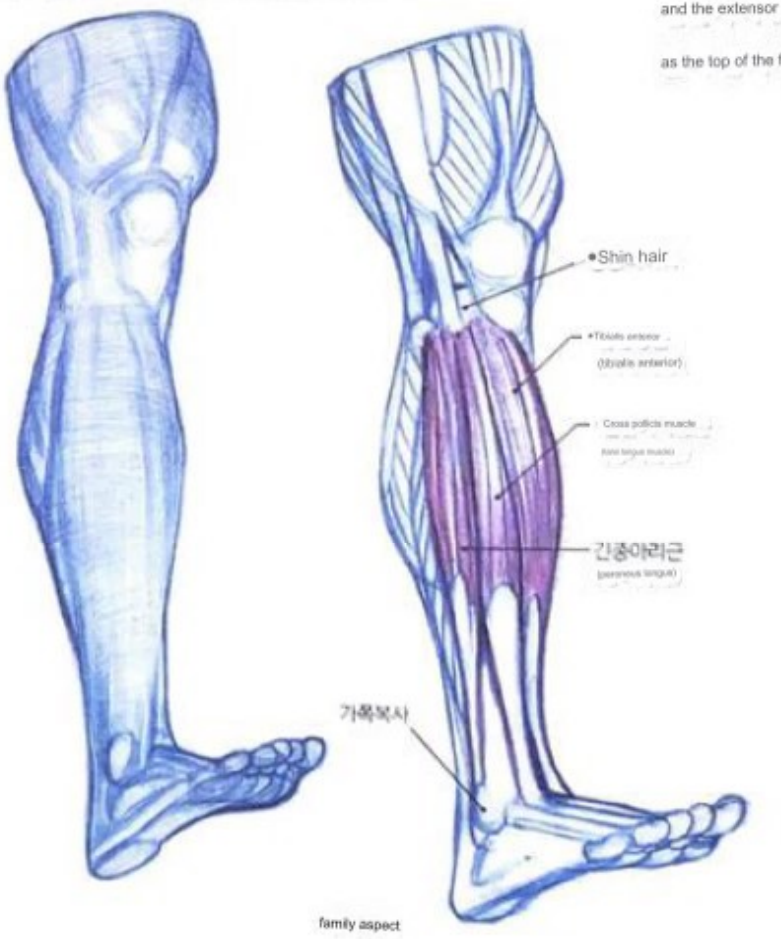
Just as the wrist extensor muscles are largely divided into three strands, the muscles in the front of the calf are also 'flat muscles', which are largely divided into three strands. Tibialis anterior muscle. The long toe muscle originates from the head of the tibia, and the peroneal longus muscle originates from the head of the fibula. The tibialis anterior muscle attaches to the front of the medial malleolus, and the long toe extensor muscle enters the center of the instep and attaches to each of the four toes except the big toe. The long calf muscle goes behind the family malleolus and attaches to the sole of the foot. There are other small muscles, but they are not visible from the outside, so I will omit them.

Use

The muscles in the front of the calf are commonly used to raise the top of the foot, and have an opposite action to the muscles in the back of the calf. The tibialis anterior and calf longus raise the top of the foot, and the extensor digitorum longus lifts the toes as well as the top of the foot.



inner side

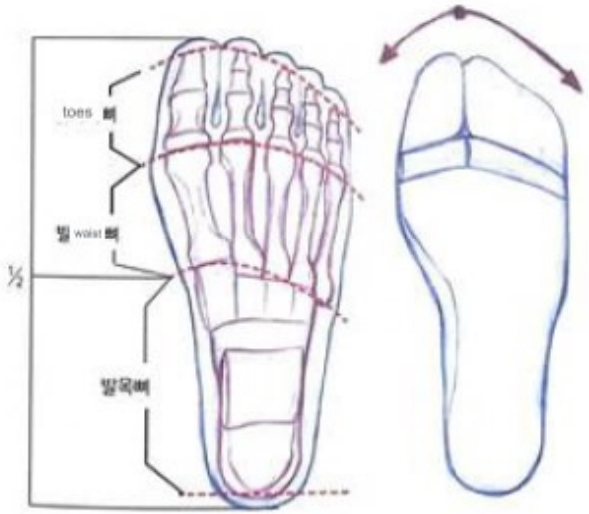


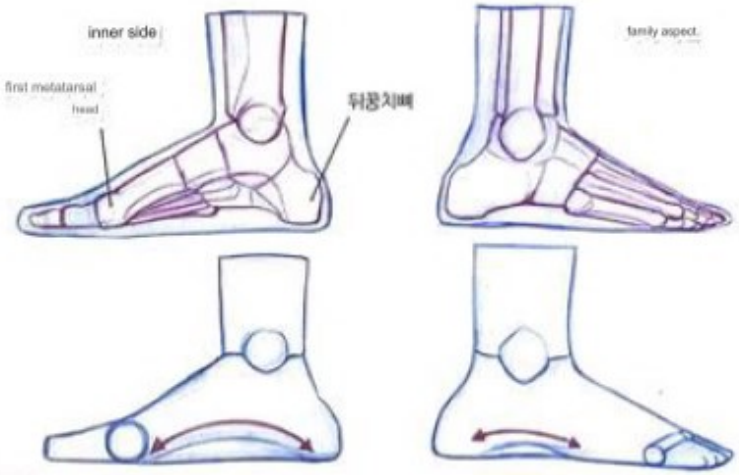
family aspect

■Foot movement and flow

When studying the human body, there is a tendency to neglect the feet, which are the part furthest from the face. However, the feet are the part of the body that comes into direct contact with the ground. If the feet are drawn in an unstable form, even if the center of gravity is correct in the posture itself, the center of gravity will collapse when viewed as a whole. For example, if our feet are shaped like horseshoes, our position of center of gravity must change to match the shape of the feet. Humans have achieved the current flow of the human body by adjusting their center of gravity to the shape of their feet. The foot is basically divided into the toe bones, metatarsal bones, and ankle bones. The ※ point of the entire foot is where the metatarsal bone and ankle bone meet. The line connecting the ends of the toes curves down, on average, around the point where the big and index toes meet.

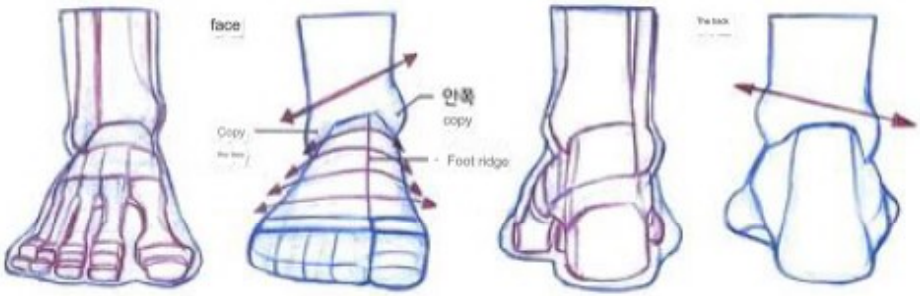
When drawing a foot, it's easy to think of it as drawing a foot wearing socks. In this book, rather than approaching the foot anatomically, we will briefly explain the movement and flow of the joints in diagrams.





side of the foot

When looking at the foot from the medial and lateral sides, the common feature is that an arch-like flow appears, and the difference is that the arch is wider on the inside than the family. This arch serves as a cushion to support your body weight.



front and back of the foot

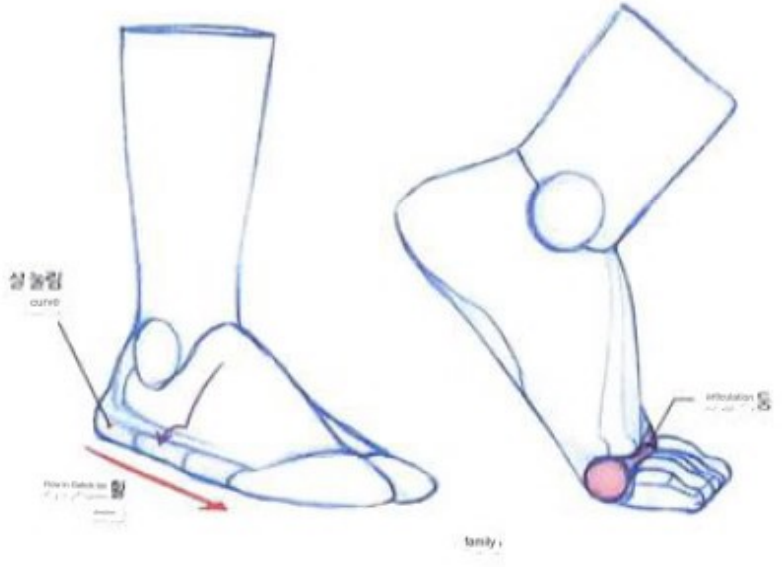
When you look at the foot from the front, it changes from horizontal to arched as you go from the tips of the toes to the top of the foot. The dorsal ridge, which is the center of the arch, is located on the border between the thumb and index finger. You can see from the picture above that the flow of the inner arch around the instep ridge is steep, while the flow of the family arch is gentle. The arch shape at the front also provides a cushioning effect like the side. The slope of the malleolus on both sides of the ankle is not horizontal, and the medial malleolus is higher than the lateral malleolus.

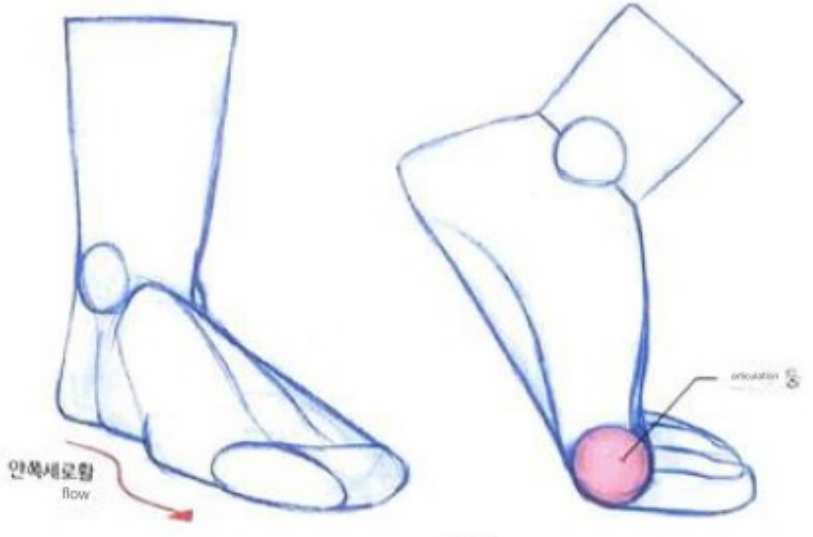
side-to-side movement of the ankle

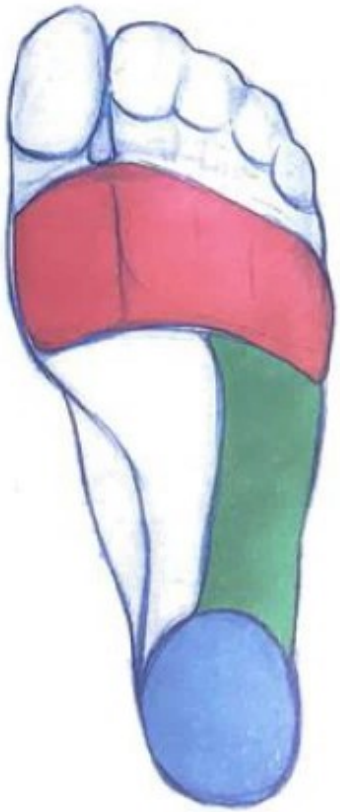
If you look at the left and right movement of your ankle, your ankle will bend more inward than outward. The reason is because of the location of the ankle bone. The malleolus is located further down than inward, limiting outward movement (picture on the right). This is why in daily life, we often get twisted inward rather than outward.

Features of the feet

To simply understand the movement of the toes, tie the big toe and the remaining four toes together and then move the toes around the joint pillar (picture below). The medial arch of the foot is straight and the inner arch of the foot is curved. Please be careful as many students often make the mistake of drawing the flow of the family vertical bow in a curved manner like an inner vertical bow. As in the first picture, when the foot touches the floor, the side blade is pressed by the body weight, creating a curve. When looking at the foot from the inside, all the toes are visible, but when viewed from the inside, the remaining toes other than the thumb and index finger are hidden. This is because the length becomes shorter and smaller in size from the thumb to the little toe.







area of the sole

Because we rarely draw angles that show the soles of our feet, there is a lack of research on the soles of our feet.

I find it vaguely difficult.

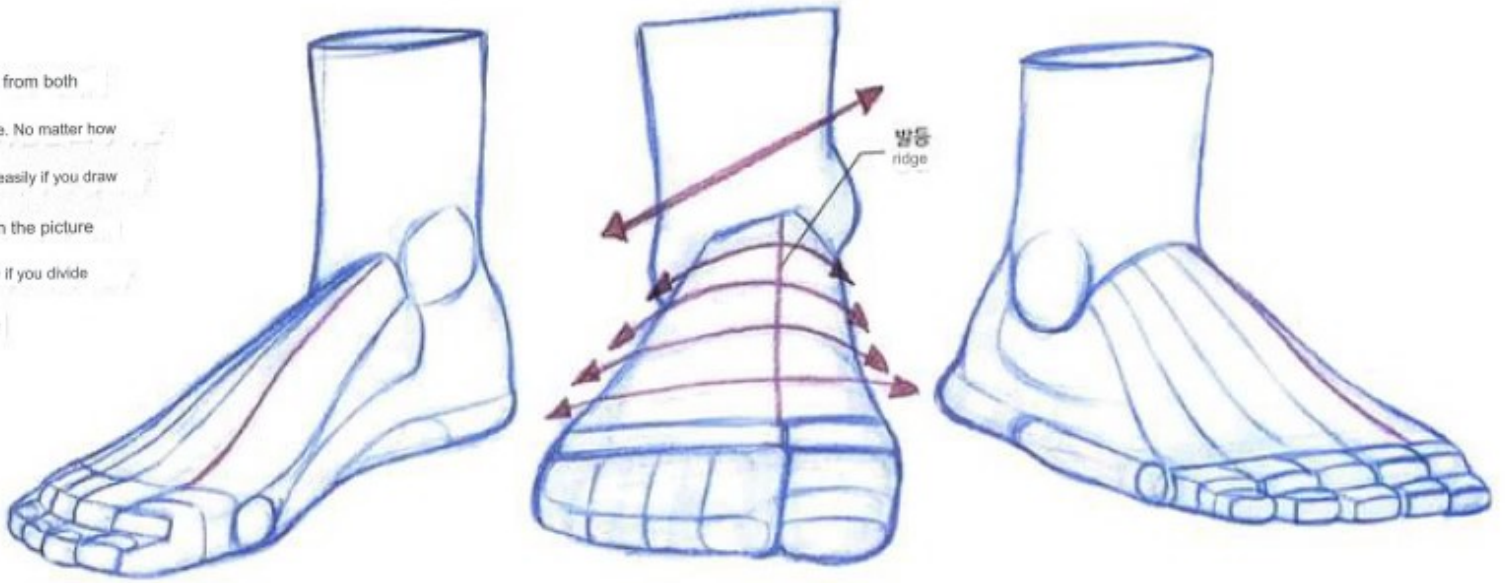
In that case, apply this method to three areas on the sole of the foot as shown in the picture above.

It's easier to understand if you think about it separately.

Practice drawing the angles you see.

The baseline of the foot shape

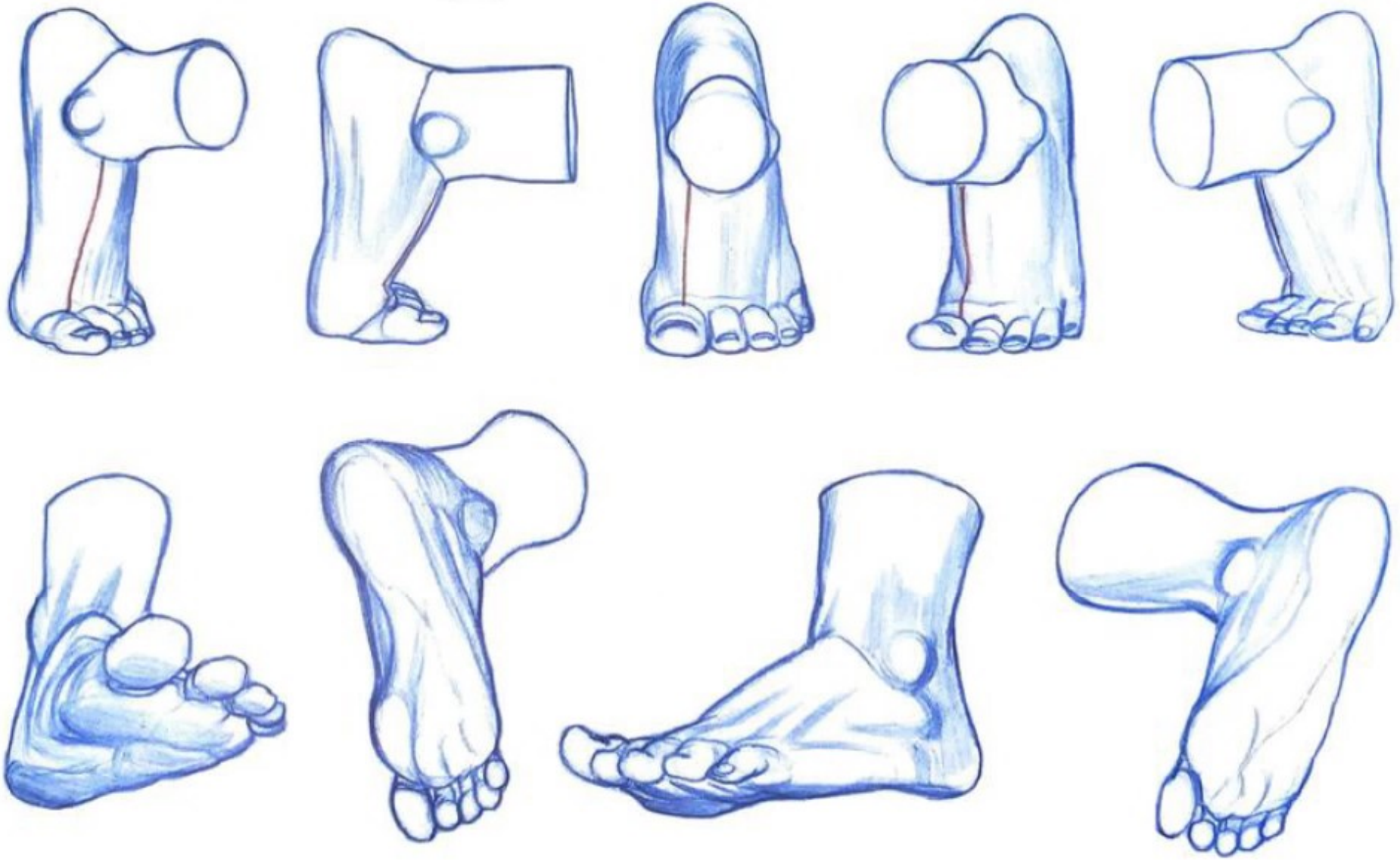
The top of the foot is arched from front to back and from both sides, so the flow changes greatly depending on the angle. No matter how complex a shape is, you can understand its shape more easily if you draw it with a representative reference point. As shown in the picture on the right, the structure can be understood more clearly if you divide it into the inner and lateral sides based on the highest ridge on the top of the foot.



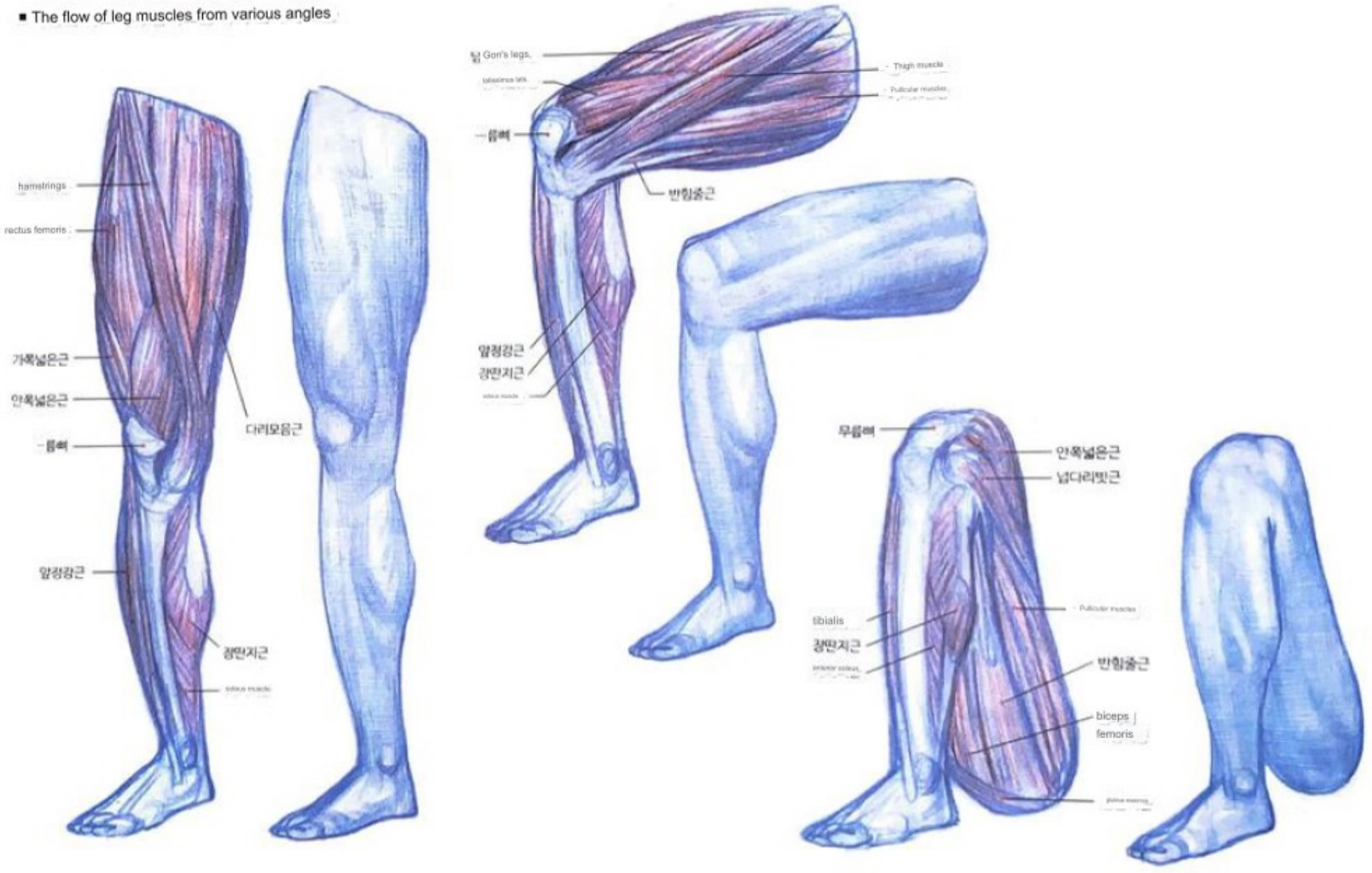
structure of the toes

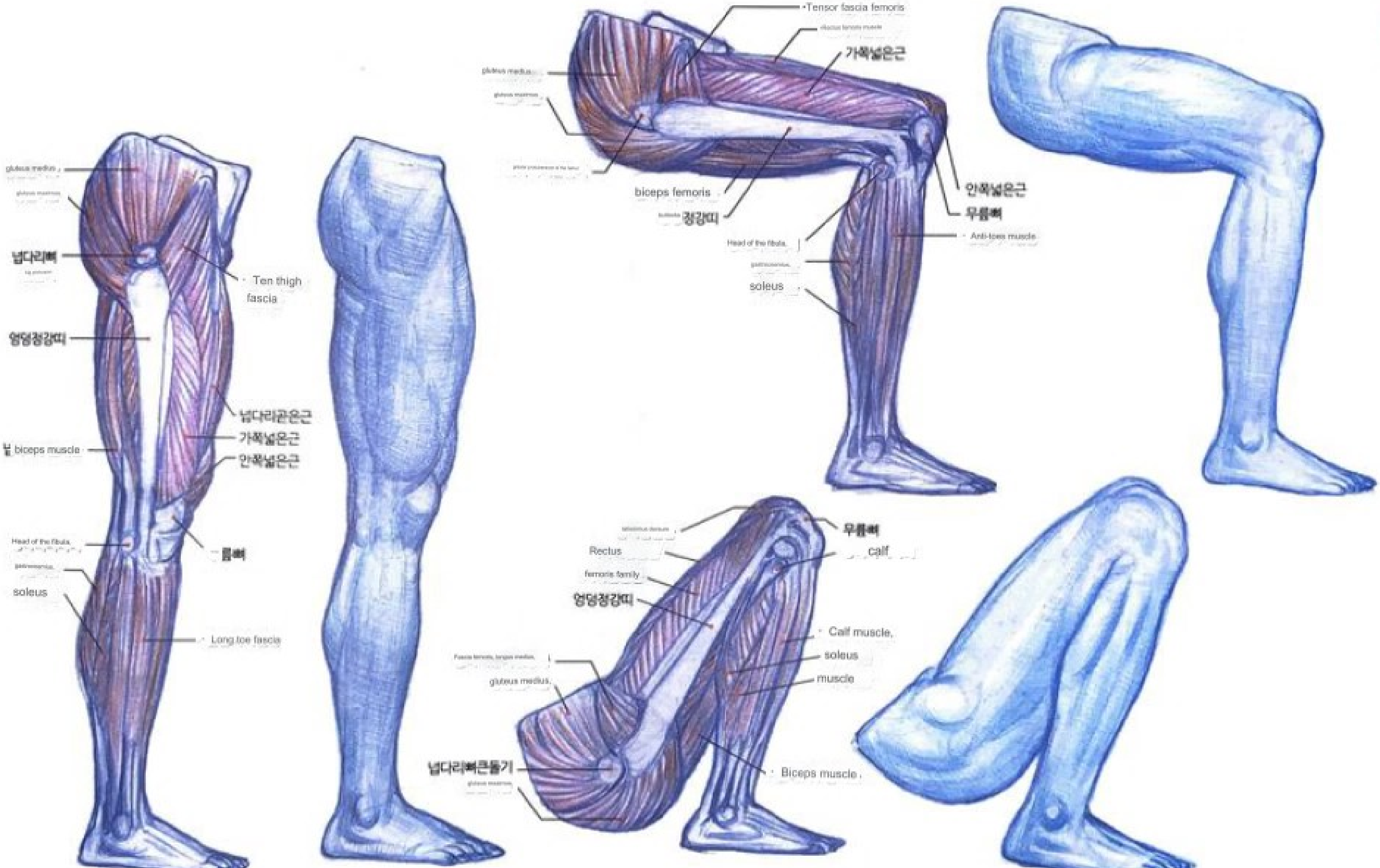
Simplifying the structure of the toe into a shape, the angles are created in steps. Develop your form on top of this basic flow.

Let's apply what we learned earlier to draw feet from various angles.

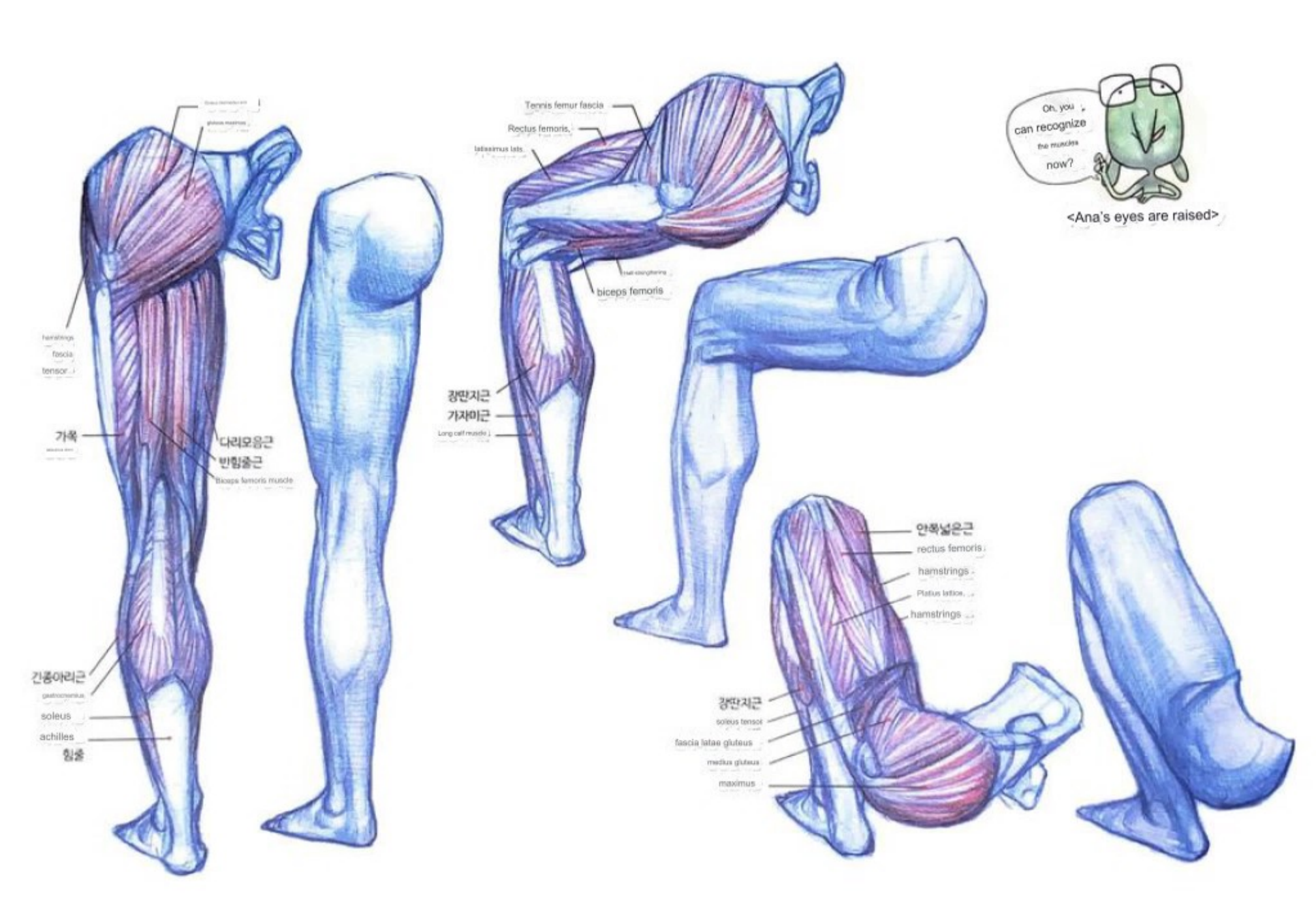


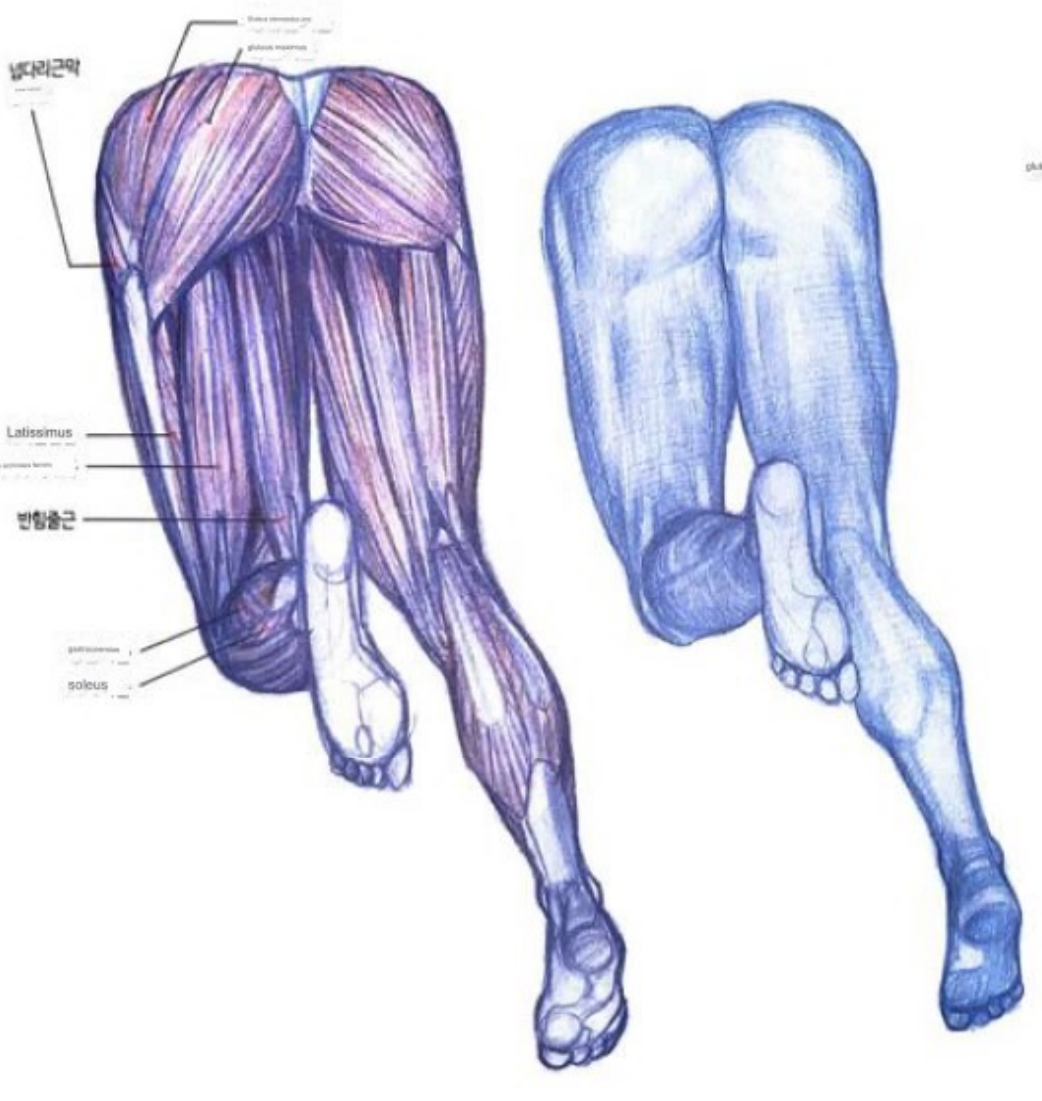
■ The flow of leg muscles from various angles

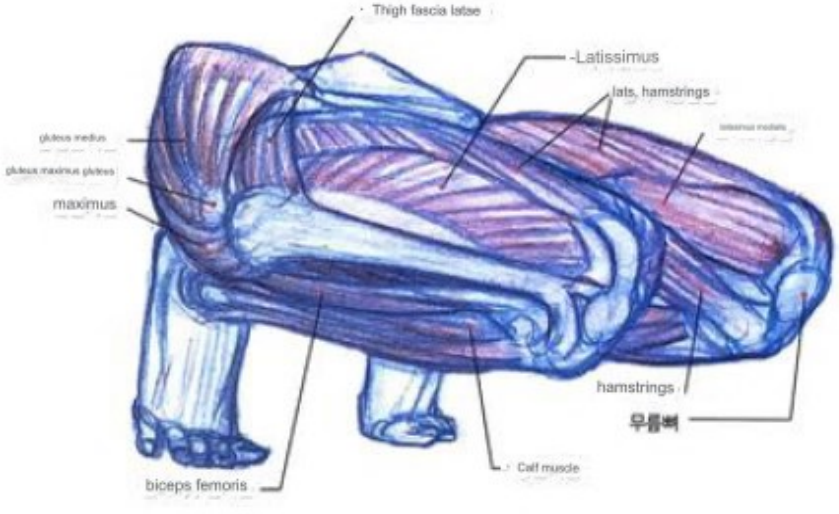


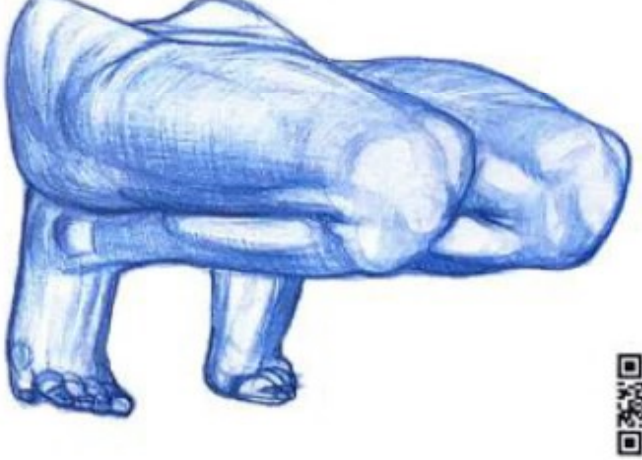


gluteus medius
넙다리뼈
Ten thigh fascia
엉덩정강띠
넙다리곧은근
가쪽넓은근
안쪽넓은근
biceps muscle
Head of the fibula,
soleus
Long toe fascia
Tensor fascia femoris
가쪽넓은근
biceps femoris
정강띠
안쪽넓은근
무릎뼈
Anti-toes muscle
Head of the fibula,
soleus
무릎뼈
Rectus
calf
femoris family
엉덩정강띠
Calf muscle,
soleus
muscle
gluteus medius,
넙다리뼈큰돌기
Biceps muscle


Oh, you
can recognize
the muscles
now?
<Ana's eyes are raised>
Tennis femur fascia
Rectus femoris
latissimus lats
biceps femoris
hamstrings
fascia
tensor
가쪽
다리모음근
반힘줄근
Biceps femoris muscle
장딴지근
가자미근
Long calf muscle
안쪽넓은근
rectus femoris
hamstrings
Platius latiss
hamstrings
장딴지근
soleus tensor
fascia latae gluteus
medius gluteus
maximus
긴종아리근
gastrocnemius
soleus
achilles
힘줄


넓다리근막
Latissimus
빈힘줄근
soleus


Thigh fascia latae
-Latissimus
lats, hamstrings
gluteus medius
gluteus maximus gluteus
maximus
hamstrings
우름벽
Calf muscle
biceps femoris



Collaboration of diagramming and anatomy

Once you have studied diagramming and anatomy and are able to express the basic human body, it is now time to think about what kind of performance you want your character to perform. For example, when drawing a character sitting down, the drawing process is simply boring. It doesn't provide much fun to the viewers either. If you think about 'how' to sit according to the character's emotions or personality, the range of expressions becomes richer. You can tell a story even with just one posture.

While many people find it fun to set up the concept of a character like this, the next step is a bit of a headache.

'Where is the weight placed?' 'Is the movement of this joint in a natural state?', 'Are the parts where force is applied and where the force is exerted appropriately expressed?

You need to be as specific as possible, such as 'Does it well represent the physical differences between men and women?'

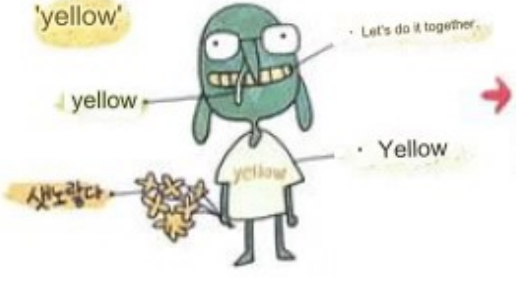
This added sense of realism brings life to the character and makes it more persuasive.

However, when you try to apply what you learned in theory to the pose you want to draw, it is not as easy as you think.

When I learned each item separately, I understood it, but when I tried to apply it in a comprehensive way, the information was not connected and I ended up drawing according to my original habit.

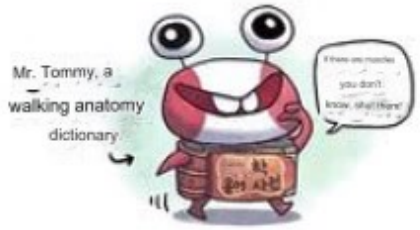
In this chapter, we will learn how the theories learned earlier are applied in practice through diagrams and anatomy for each posture, and material drawn with real-life men and women. In addition, we will look at each posture from various angles, sequential movements, and applied movements to understand the form from various perspectives and study the characteristics of the posture.

Just as there are different colors,



There are various emotions in posture.

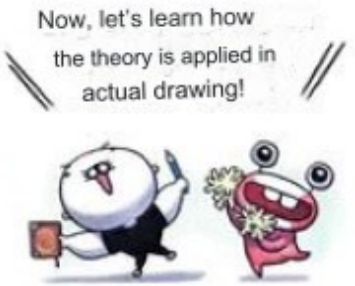
Now
it's real !



Just as knowing how to exercise doesn't build muscle, the same goes for drawing.

Because if you think you know, you won't practice.

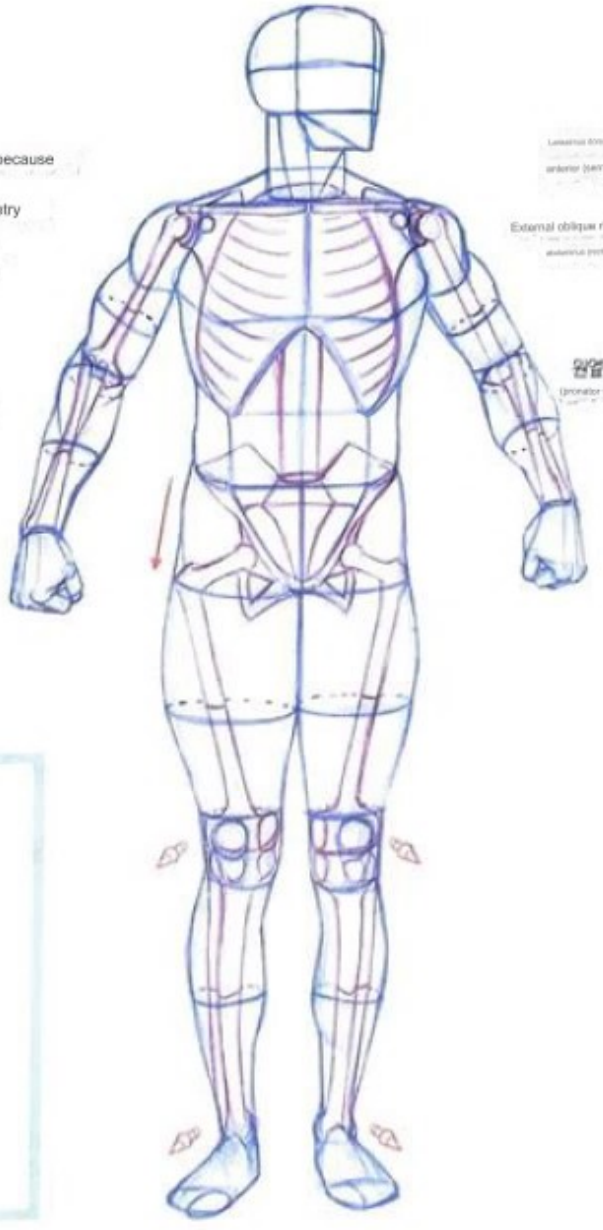
When defining 'knowing', it is not theoretical knowledge, but can you draw? It is better to judge by asking, "Is there anything?"

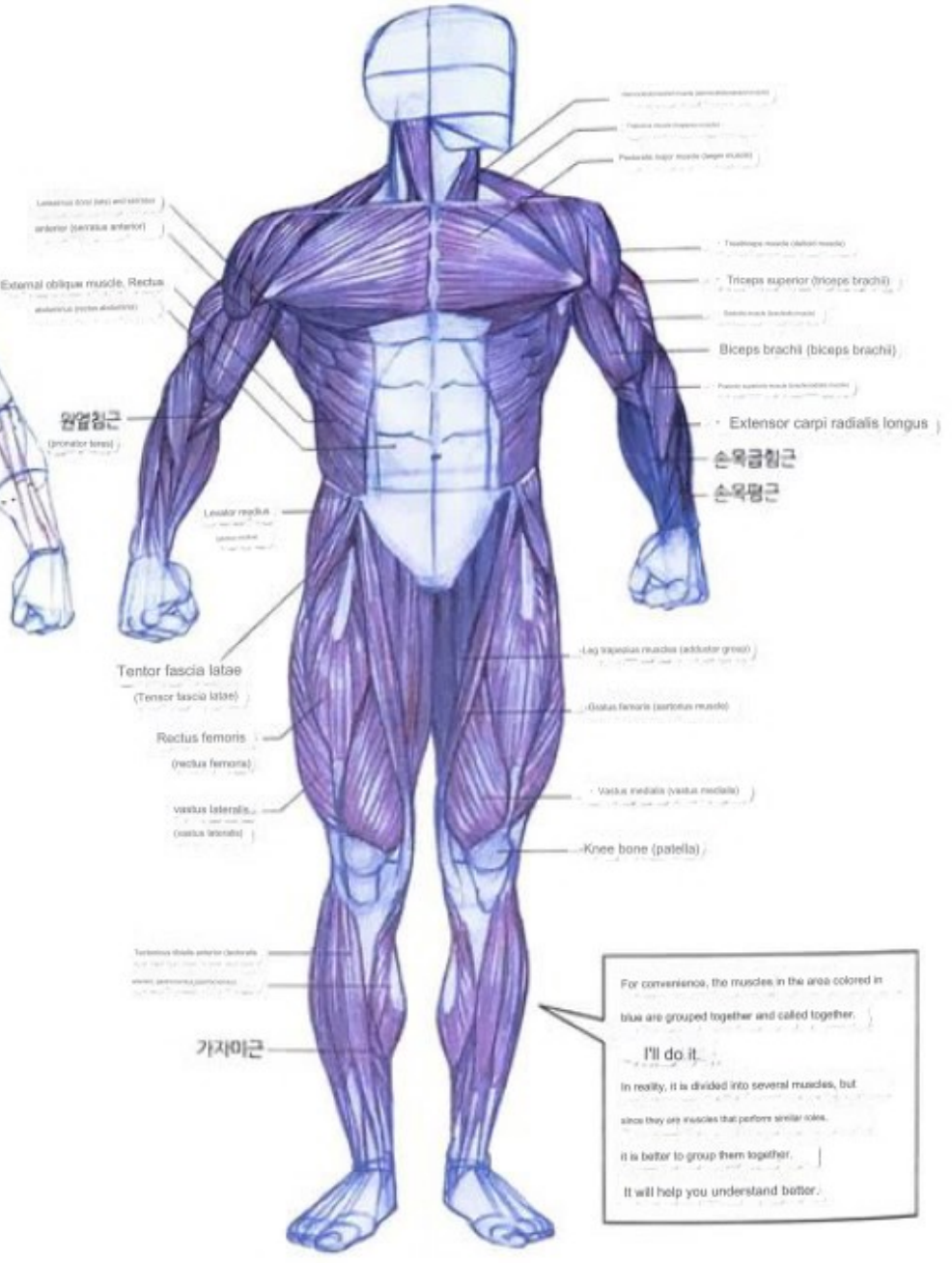


■ Front-facing posture

The importance of geometry

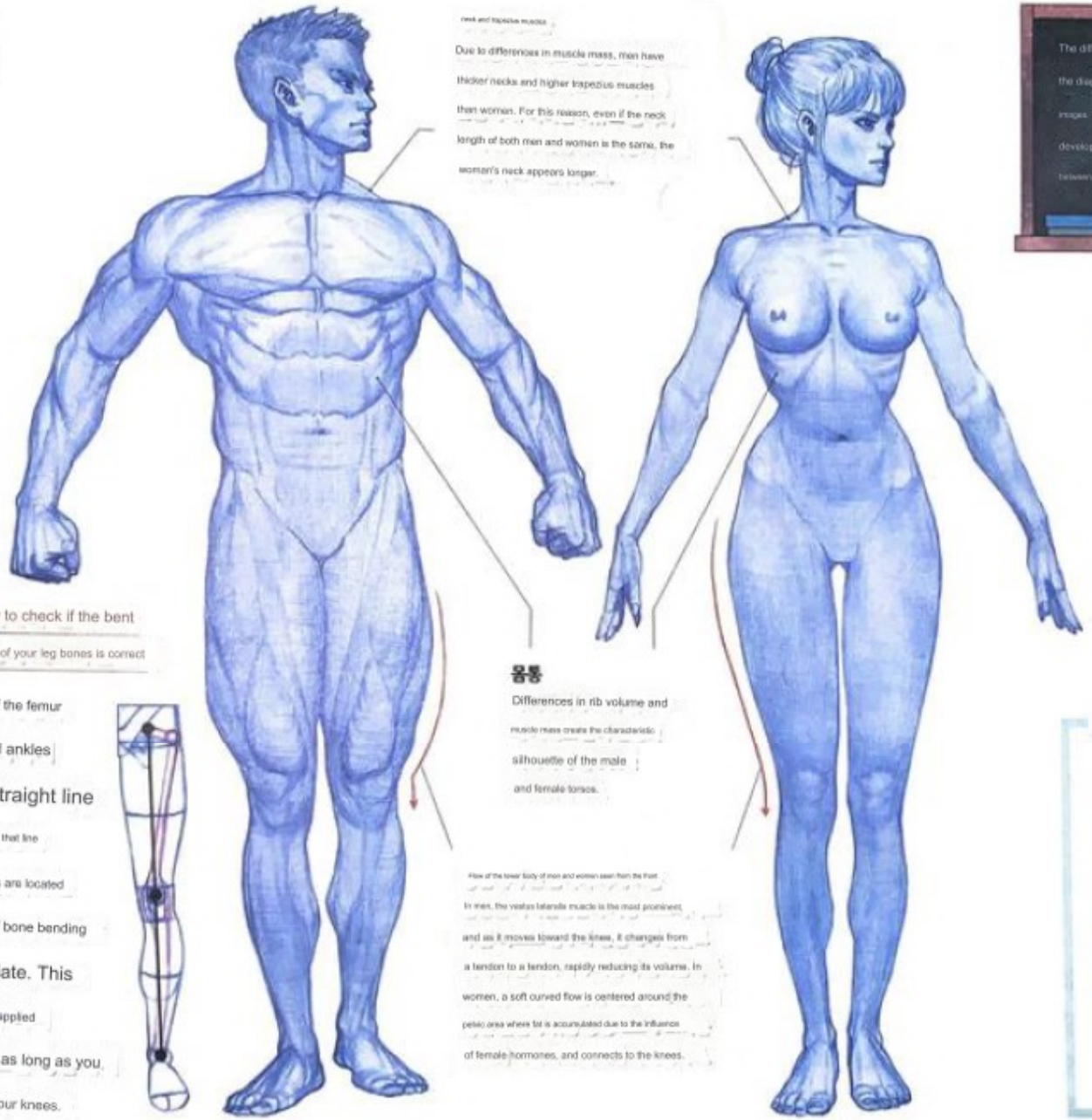
Even though it is the most basic posture, it is difficult to draw because the posture of standing straight ahead requires precise symmetry of tilt and shape. Since the sides are not visible, it is difficult to create a three-dimensional effect. After drawing the skeleton by checking the proportions, center of gravity, and natural movement, draw a simple flow shape on the skeleton to get a feel for the volume.





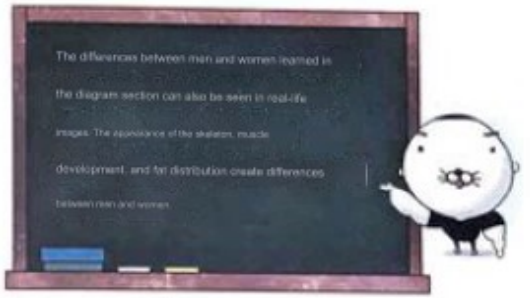
요령노트 Male lower body diagram

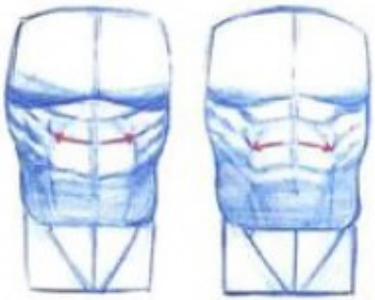
When men stand at attention, there is no gap between their thighs. Additionally, a curved and widened pelvic area creates a feminine feel. As shown in the picture, with straight legs, the direction of the kneecap and the direction of the toes should be the same.



Neck and trapezius muscles

Due to differences in muscle mass, men have thicker necks and higher trapezius muscles than women. For this reason, even if the neck length of both men and women is the same, the women's neck appears longer.





Various shapes of the rectus abdominis muscle

The shape of the rectus abdominis muscle varies from person to person.

there is.

How to check if the bent angle of your leg bones is correct

At the head of the femur to knees and ankles

Draw a straight line

Each time, within that line

When the joints are located

The degree of bone bending is appropriate. This method can be applied at any angle as long as you do not bend your knees.

몸통

Differences in rib volume and muscle mass create the characteristic silhouette of the male and female torsos.

Flow of the lower body of men and women seen from the front

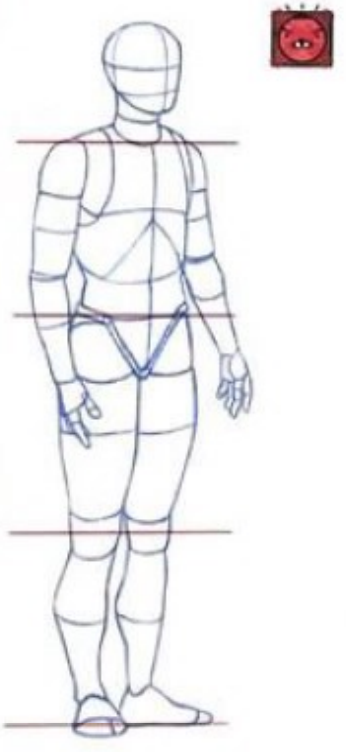
In men, the vastus lateralis muscle is the most prominent, and as it moves toward the knee, it changes from a tendon to a tendon, rapidly reducing its volume. In women, a soft curved flow is centered around the pelvic area where fat is accumulated due to the influence of female hormones, and connects to the knees.

Exaggerated leg line

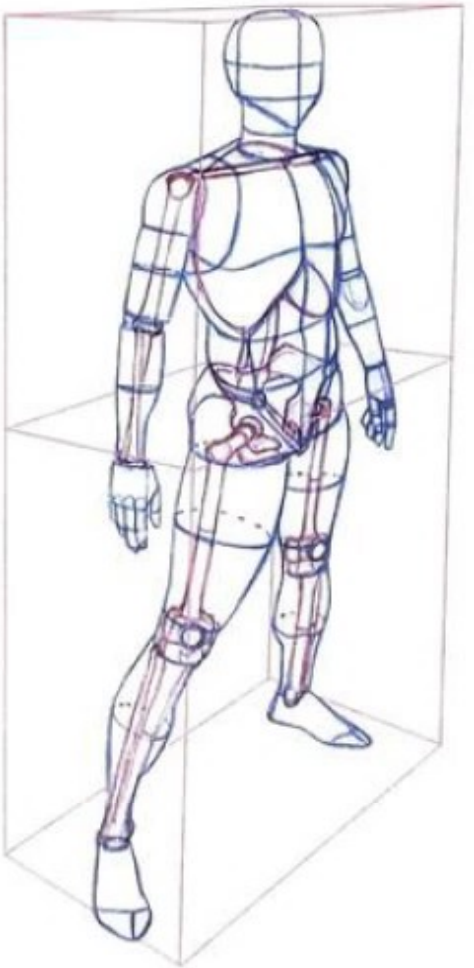
When emphasizing the flow of the legs, they are often drawn outward like an O-shaped leg. This exaggerated flow comes from the habit of looking at the picture in parts, so it is important to draw while observing the overall flow of the picture.

■ half side standing posture

Limbo slope of the half side

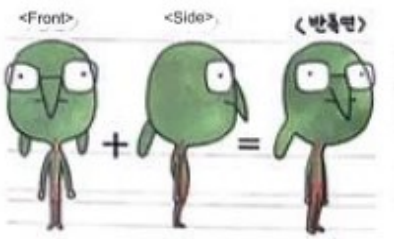


The slope of the line from the shoulder line to where the feet are located should not be the same.



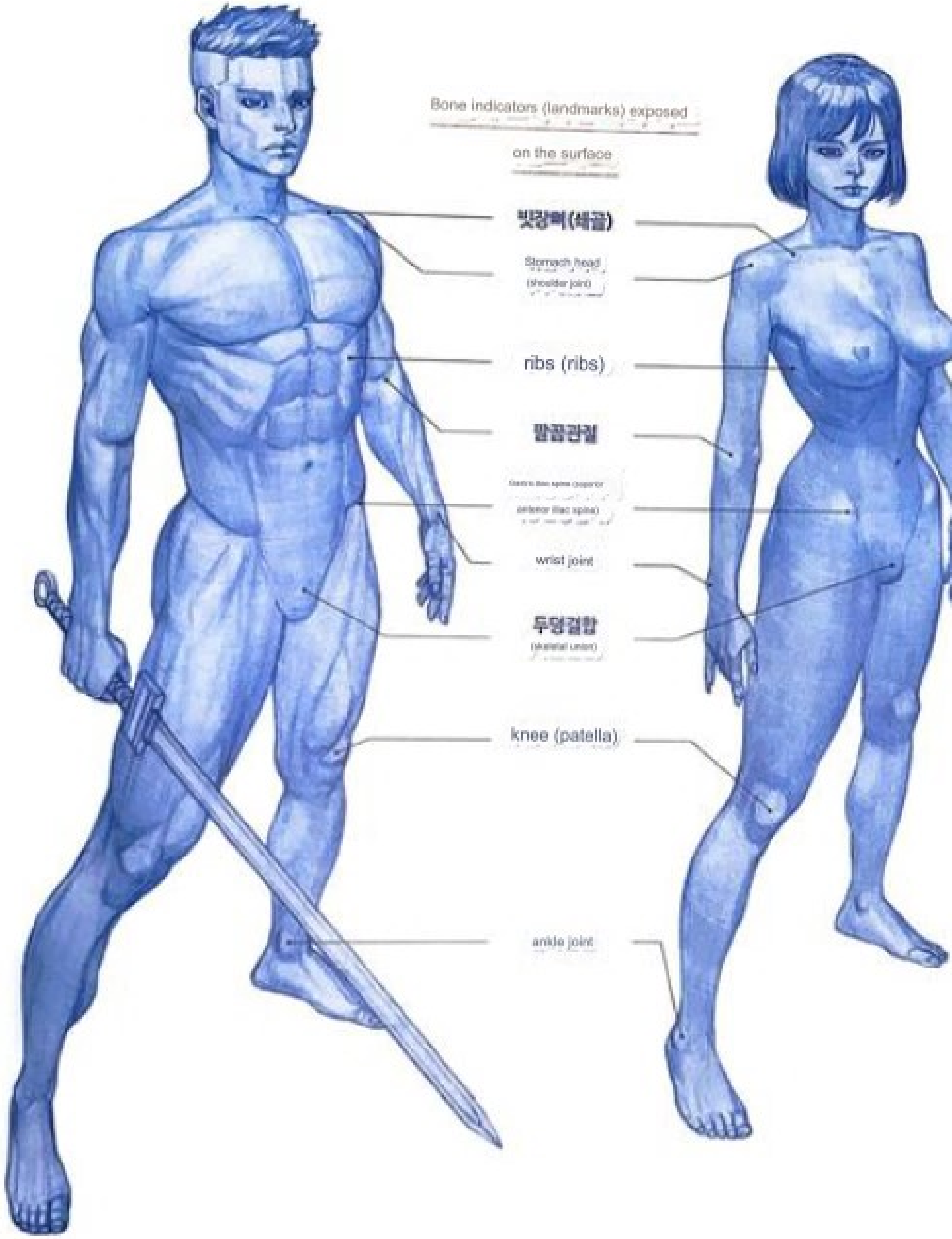
Draw a character that fits the space

The slope of the horizontal line of the body becomes steeper as it moves away from eye level. Even if the proportions and shape of the human body are drawn correctly, if the viewpoint and center of gravity are wrong, the drawing will look unstable and be flat. You can draw a three-dimensional person more easily by first setting the eye level, drawing a cube that matches it, and then drawing a person inside the cube. Please create a space first before drawing the character!



front and side information properly. I need to understand

You can draw a half-profile figure.



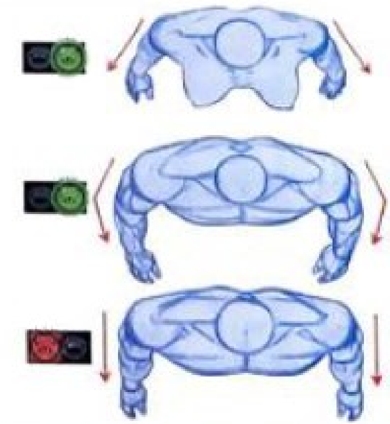
Body flow in hemilateral plane

As we learned in Chapter 1, the flow of the human body from the full side is curved rather than vertical, and the lower body also falls backwards to balance the tilted upper body. These features are more evident at the posterior angle, where the curvature of the spine is visible. The reason it is difficult to draw a standing posture naturally is because the curved flow of the whole body and the tilt that changes depending on perspective must be applied at the same time.

For game artists who basically draw characters at a half-side angle, this is a familiar posture that is practiced to the point where it is almost memorized.

오답노트 Flow of men and women's arms

When standing with both arms relaxed, women's arms are bent outward and men's arms are bent inward. This O-shaped flow of the male arm is especially difficult to express from the half-side angle. Be careful, as there are many mistakes in drawing the half-side view of the arm as shown in the picture below, thinking of it as an 11-shaped arm.

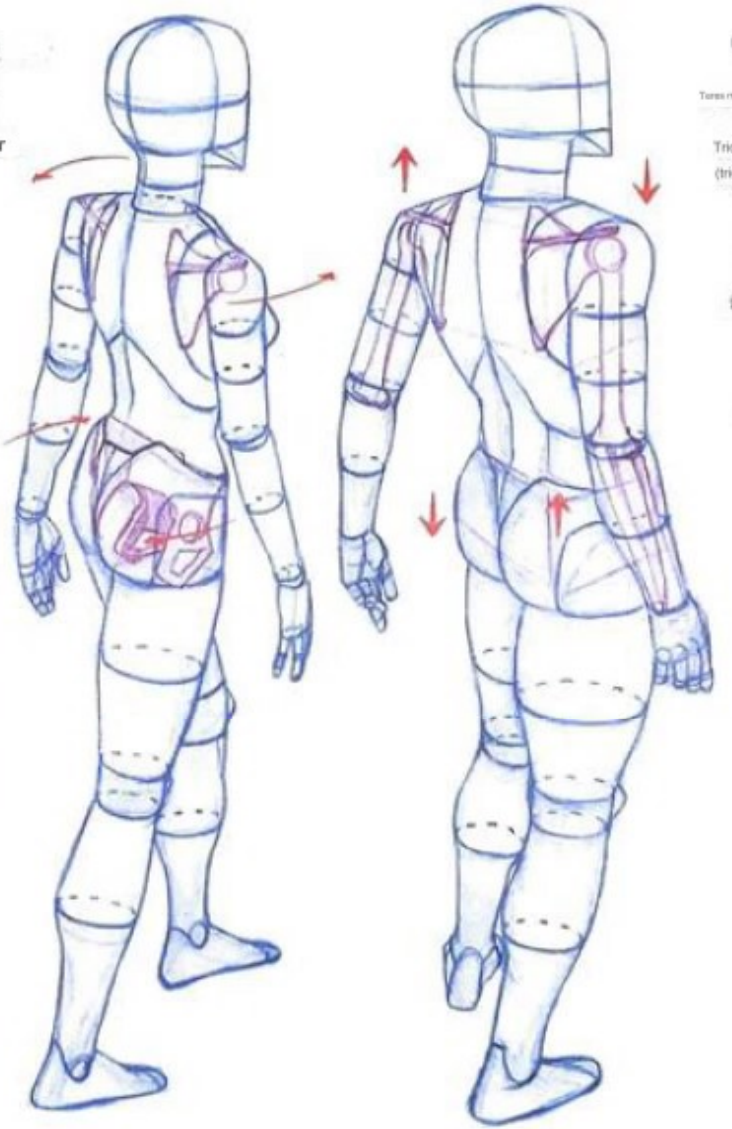


■ Basic half-side posture viewed from behind

Viewed from behind, the difference in flow between men and women

When you walk or cross your legs, the tilt of your pelvis and shoulders changes, unlike when you stand still. When you walk, your shoulders and pelvis are crossed back and forth, and when you cross your legs, they are crossed up and down. The shoulders are fixed, but the overall flow should be consistent with the movement, rather than a partial pose, such as with only the feet crossed.

The reason the entire body reacts to even the slightest movement is to balance the center of gravity.



오답노트 Mistakes made when drawing basic postures

❶ Shoulder tilt, pelvic tilt, and foot position at the same tilt
When drawing parallel or all horizontal

❷ When drawing the feet to the side regardless of eye level

❸ When drawing the waist straight and straight

Graphicalizing muscle flow

When drawing men, muscle flow is added differently from women. Rather than depicting the muscles realistically from the beginning, first create a diagram of the muscles as shown below.

오답노트 Excessively expressed calf flow

The calf is an important part of the body that creates the most dynamic flow. As a result, the flow of the calves is often emphasized, and it is especially often used in comics. However, in dramatization, unlike in comics, if the flow of the calf is emphasized, the human body will look wrong, so it is important to express it as it actually is. The flow of the calf varies depending on the angle from which it is viewed. For example, a bow appears curved from the side, but appears straight from the front. Even the curved flow of the bridge sometimes appears straight.

This

■Posture that emphasizes the back

*The area of abseil is narrow and the tendon is wide.

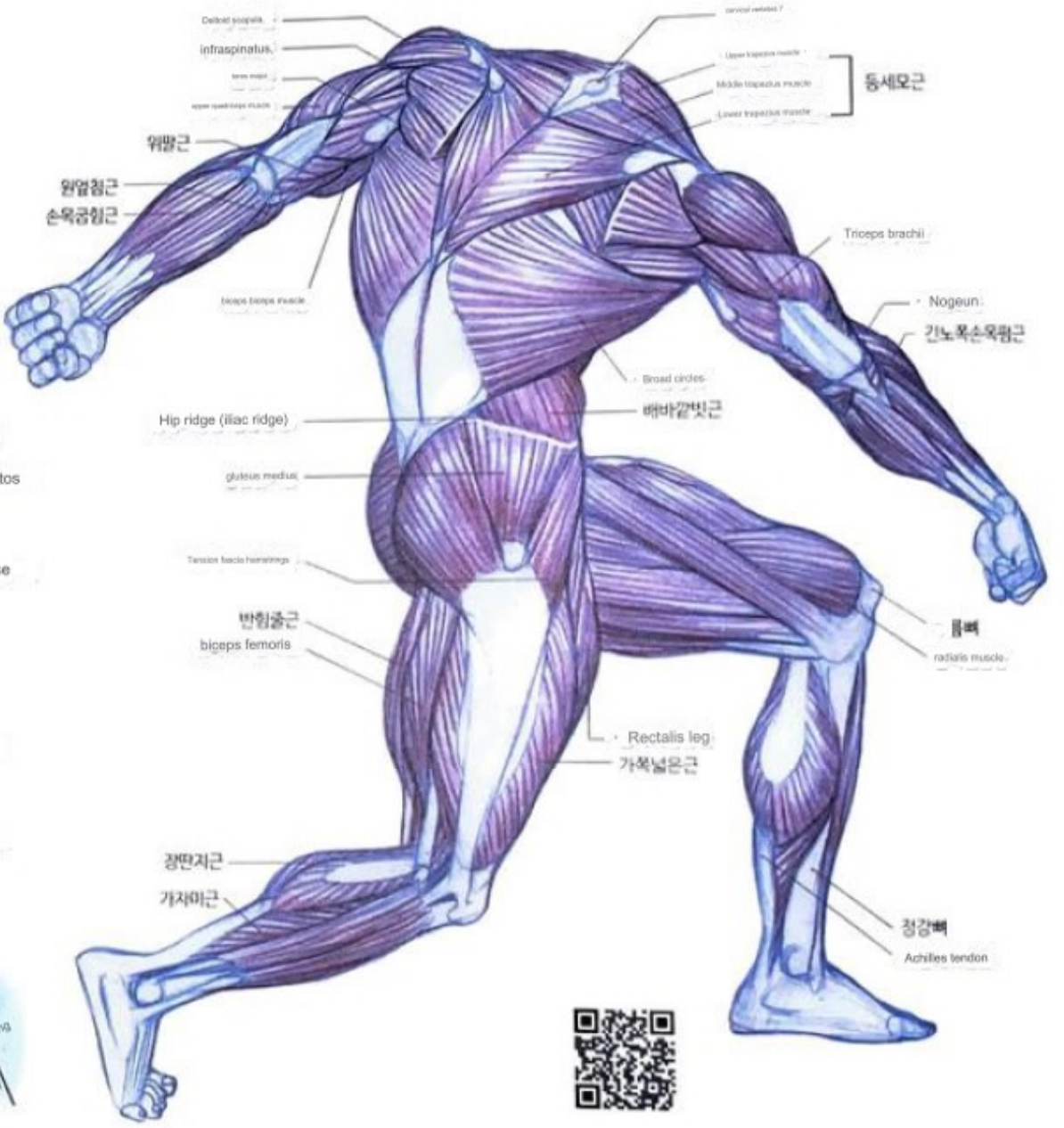
*The area of salvage is wide and the tendon is narrow.

Differences in muscle appearance

Just as each person's face and body shape is different, muscles also have slightly different ratios of sinew and tendon. So, after studying the location of the muscles, you can look at photos of various actual models to understand the differences and decide on the body type you prefer. If you study with only one material, you will have difficulty studying muscles because it is not compatible or applicable to other model photos.

The widest muscle, the latissimus dorsum

The latissimus lats is the largest muscle in our body. Traces of their evolution from apes that lived hanging from trees still remain. Compared to other muscles, the latissimus dorsi has the largest difference in muscle mass before and after exercise. When you open your arms to the sides, they spread wide, so fitness trainers liken the wide rounded arms to the wings of a squirrel.



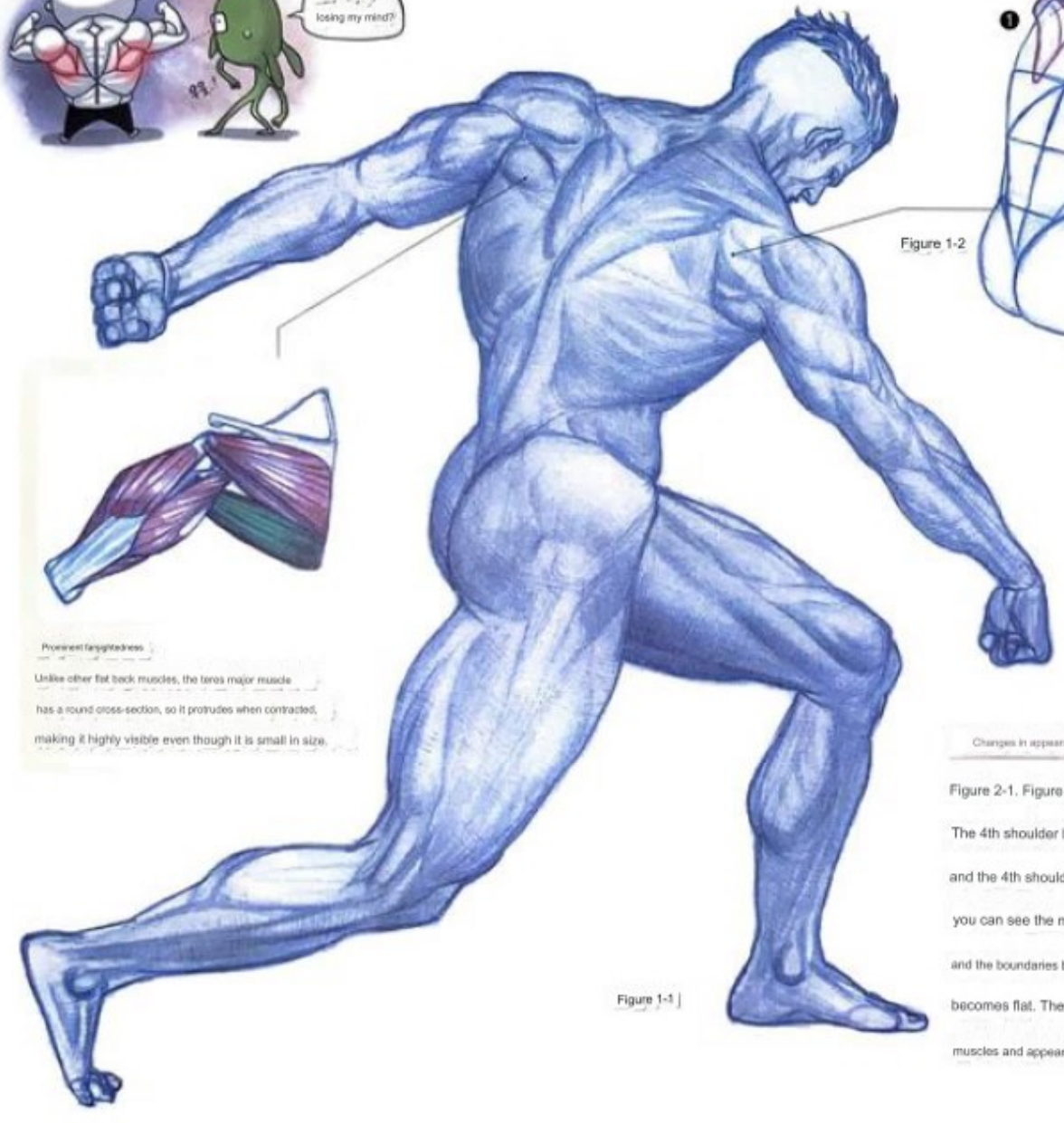


Figure 1-1

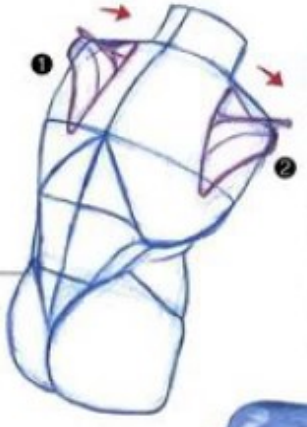


Figure 1-2

position of the shoulder blades

When both arms are pulled to the right as shown in Figure 1-1, the position of the shoulder blades is as shown in Figure 1-2. The second shoulder blade is pulled inward to the body by contraction of the trapezius muscle, and the second shoulder blade is pulled outward from the body by contraction of the pectoralis major muscle on the front of the body.

Prominent farsightedness

Unlike other flat back muscles, the teres major muscle has a round cross-section, so it protrudes when contracted, making it highly visible even though it is small in size.

Figure 2-1

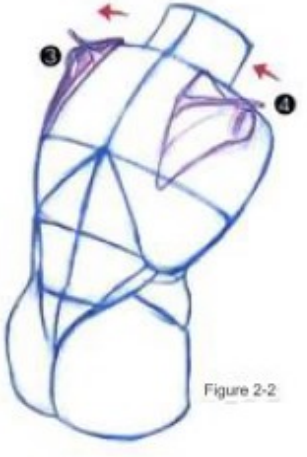


Figure 2-2

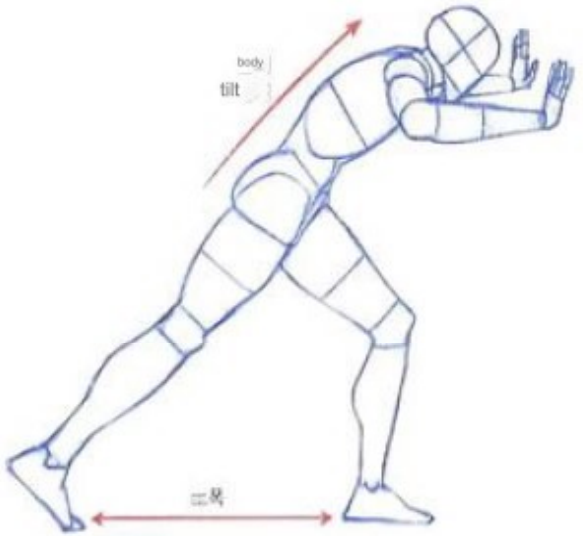
Changes in appearance due to muscle contraction and relaxation

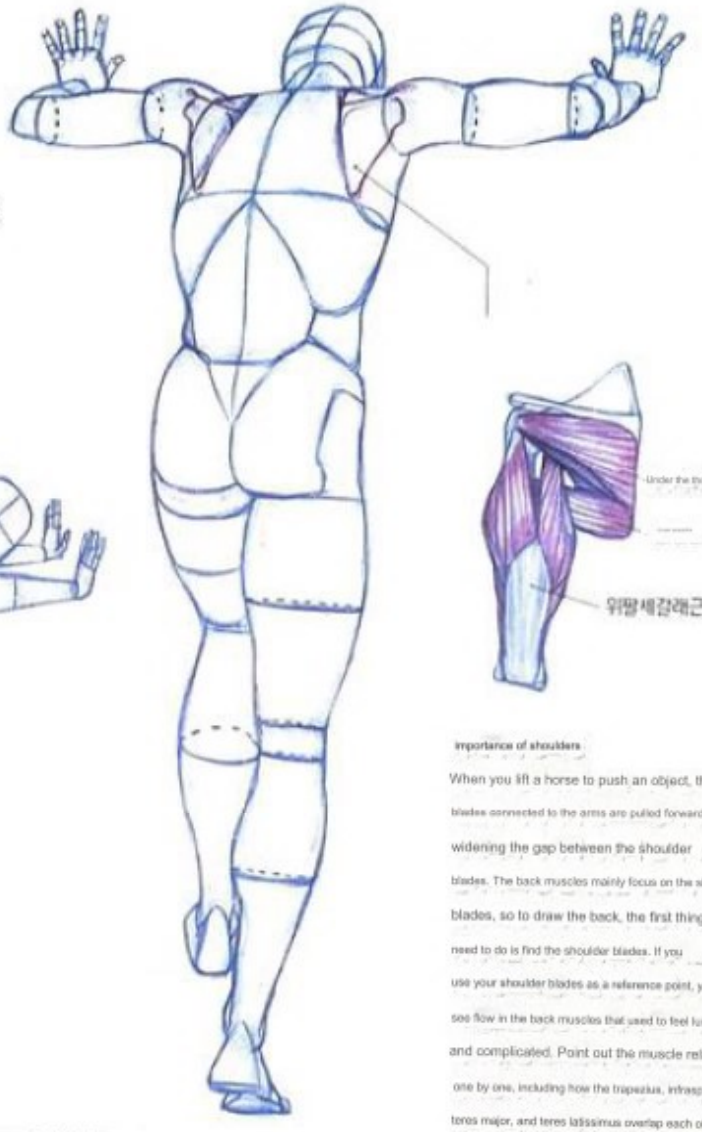
Figure 2-1, Figure 2-2 shows the posture where the arm is pulled to the left, opposite to the 2nd shoulder blade. The 4th shoulder blade is pulled outward from the body by the contraction of the pectoralis major muscle, and the 4th shoulder blade is pulled inward by the trapezius muscle. When you change your posture like this, you can see the muscles used and their appearance change. When muscles contract, they become thicker and the boundaries between muscles become clearer, and when muscles relax, the thickness of the muscles becomes flat. Therefore, you need to know which muscles are used when taking a posture to be able to draw the muscles and appearance that correspond to them.

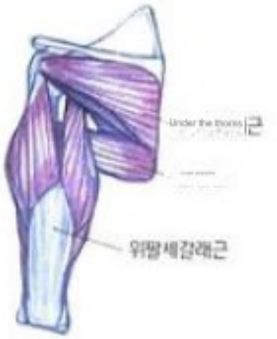
■ pushing posture

view from the side

If you look at the picture on the right, you can see how much the person bent down. It's difficult to gauge exactly how far the legs are spread. If you look at the same posture from the side (picture below), you can get a lot of information, such as torso tilt and stride width.

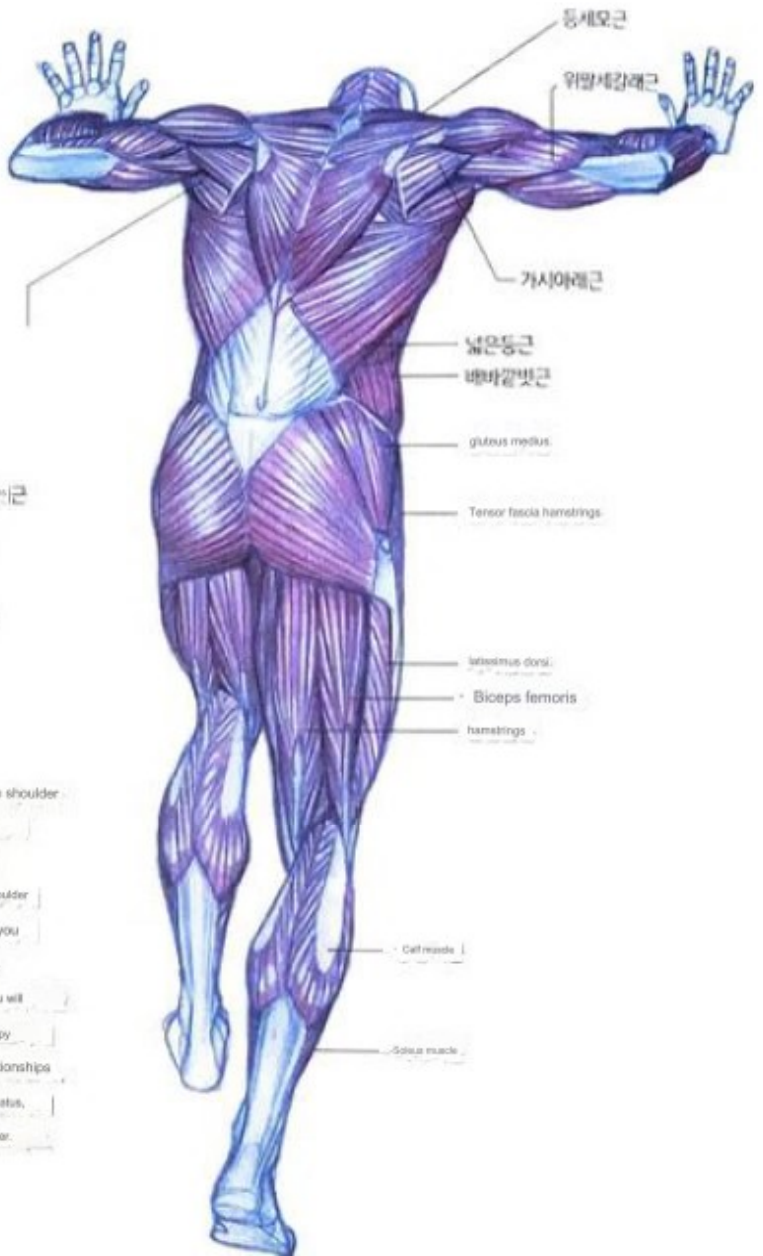






importance of shoulders

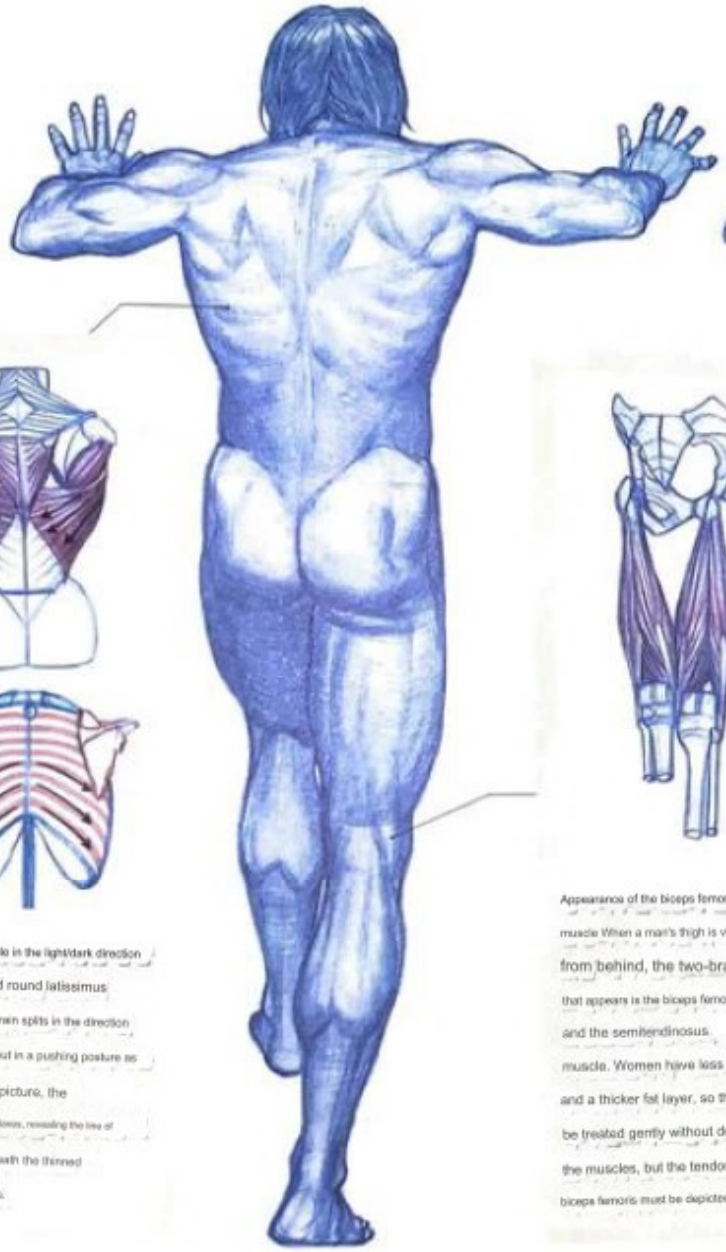
When you lift a horse to push an object, the shoulder blades connected to the arms are pulled forward, widening the gap between the shoulder blades. The back muscles mainly focus on the shoulder blades, so to draw the back, the first thing you need to do is find the shoulder blades. If you use your shoulder blades as a reference point, you will see flow in the back muscles that used to feel lumpy and complicated. Point out the muscle relationships one by one, including how the trapezius, infraspinatus, teres major, and teres latissimus overlap each other.



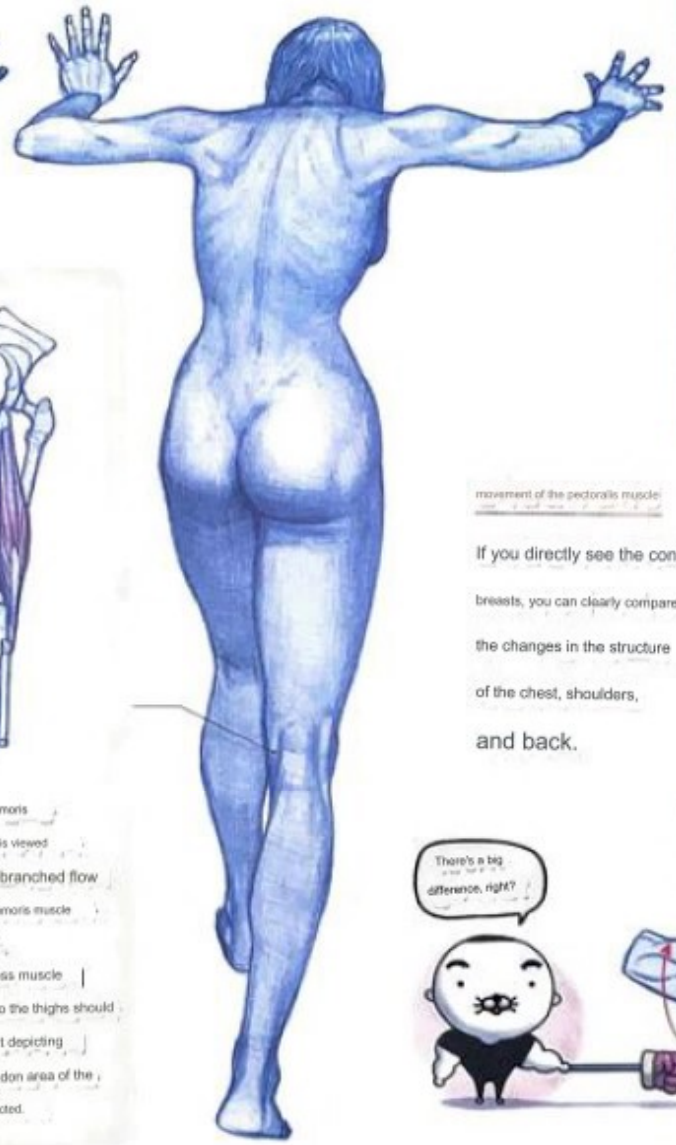
How to know your body's tilt

When thinking about a pose, try drawing it from a full side angle. You can check the exact tilt of your body.

When the muscle in the light/dark direction of the relaxed round latissimus contracts, the grain splits in the direction of the muscle, but in a pushing posture as shown in the picture, the latissimus dorsi relaxes, revealing the line of the ribs underneath the thinned round latissimus.



Appearance of the biceps femoris muscle When a man's thigh is viewed from behind, the two-branched flow that appears is the biceps femoris muscle and the semitendinosus muscle. Women have less muscle and a thicker fat layer, so the thighs should be treated gently without depicting the muscles, but the tendon area of the biceps femoris must be depicted.

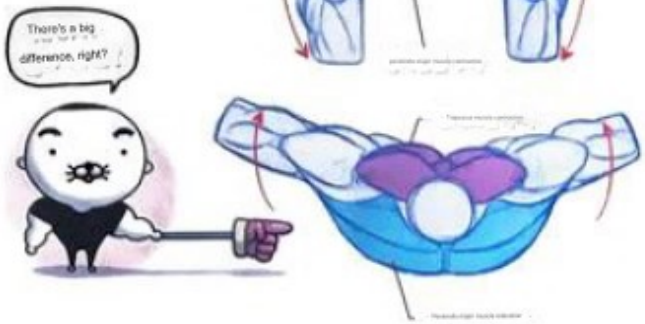


오답노트 Spinal cord line

The erector spinae muscles do not extend all the way to the hip bone. The triangular part where the sacrum is located is covered with tendons, not sinew.

movement of the pectoralis muscle

If you directly see the contraction and relaxation of the large breasts, you can clearly compare the changes in the structure of the chest, shoulders, and back.



■ Position with the weight of the upper body on one leg

오답노트 waist flow

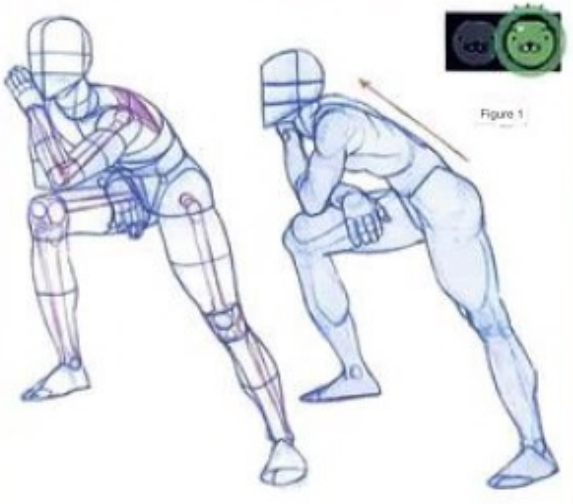


Figure 1

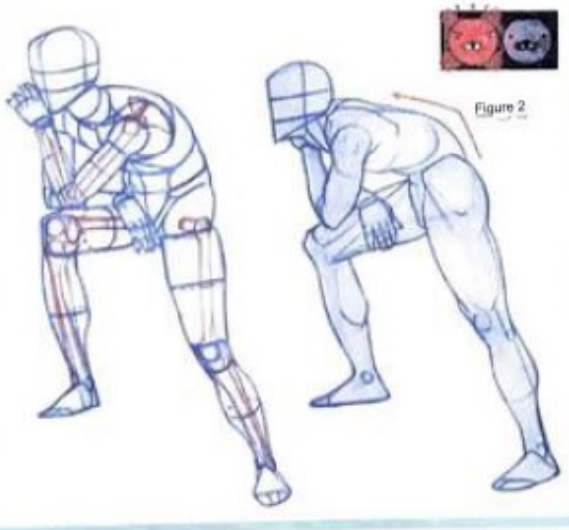


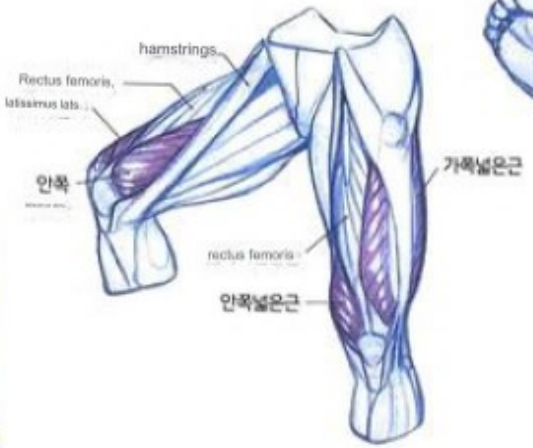
Figure 2

Analyzing posture laterally

If you take the posture above, your waist will flow in a straight line as shown in the picture on the left box. If you bend like in Figure 2, you will look like someone with a back problem. If you turn your posture completely to the side like this, you can pinpoint the reason for your mistake. Let's find the place where the center of gravity is and determine the tilt of the shoulder. The shoulder of the right arm, which is supporting the weight of the upper body, goes up, and the left shoulder, which is not carrying the weight, goes down. Since the left arm is lowered and the back is slightly visible, it is necessary to know the position of the shoulder blades in order to express the back muscles. Be sure to indicate the location of the shoulder blade from the drawing stage.

flow of legs

Although muscle flow is not shown in detail in women, knowledge of anatomy is essential when drawing men. Observe what the front thigh muscles look like on the outside through anatomy data. Let's check again the muscle flow and overlapping order.



Characteristic flow of women •

Women have thinner muscles, so the flow connecting the clavicle and scapula spine stands out.

Posture from a different angle

This is a low angle, as if looking up from a glass floor. The characteristic is that the lower body becomes longer due to perspective, and the upper body becomes shorter as one goes up. Study the three-dimensional structure by comparing the flow of the human body at normal angles with the flow of the human body at angles we rarely see.

■ Position with one hand facing down

cut Pelvic and shoulder tilt

Natural body tilt according to movement

In most postures, except the standing posture, the tilt of the pelvis and shoulders are offset. Rather than distributing the weight evenly on both sides, it is more natural to place more weight on one side. As shown in Figure 1 in the left box, try to create a rhythmic movement by alternating the tilt of the pelvis and shoulders. As shown in Figure 2, even if the center of gravity, proportion, and sense of mass are all correct, if the tilt of the pelvis and shoulders are the same, the liveliness of the human body is reduced.

Point of contrast

Check out the tilt of the pelvic box hidden by the legs!

Posture viewed from various angles

This posture should express alternate tilts of the pelvis and shoulders no matter what angle it is viewed from. In particular, the difference in slope is most clearly visible when viewed from the front.

■ Defeat posture

General game and muscular body type

In the 'position with one hand pointing down' on the previous page, we added the action of slamming the fist into the ground to create a more dynamic feel. When drawing a muscular character, the volume of the muscles must be increased based on accurate anatomy. Even if your body type changes, if you deviate from the basic muscle structure, you will end up becoming a monster rather than a muscular character. The split curves of the wrist extensor muscles are revealed even when a fist is clenched. Since it is a muscle that appears frequently on the outside, you must be familiar with its three-branched structure and the ratio of muscle and tendon.

■ Bowed posture

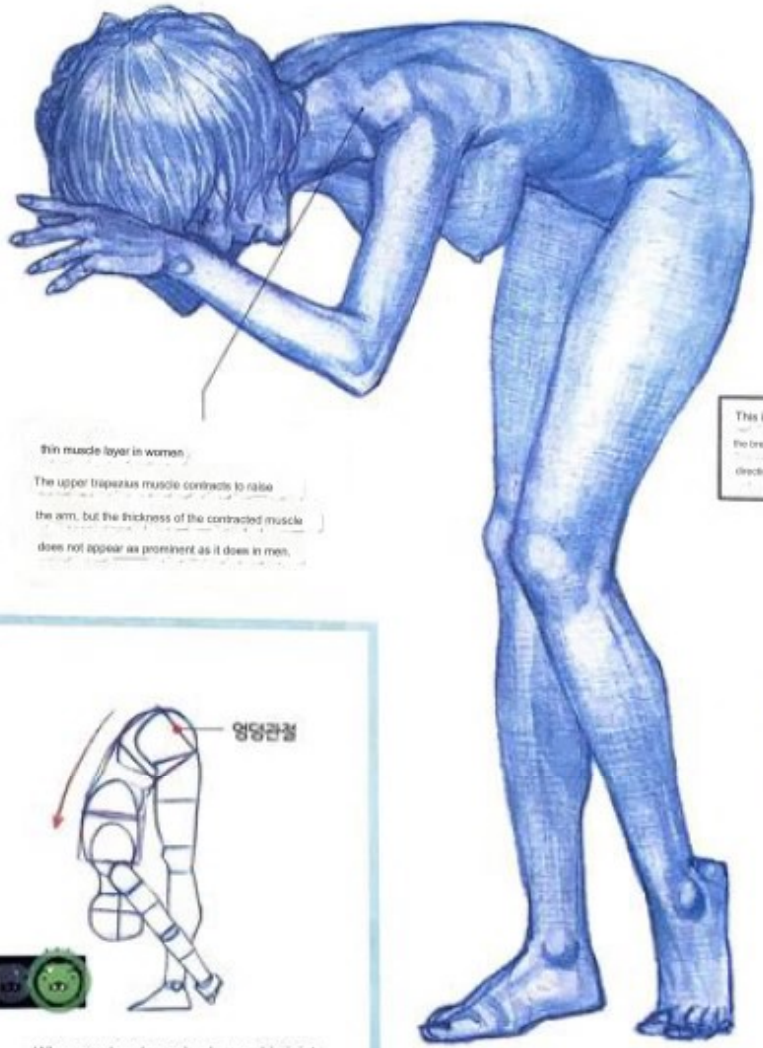
The movement of leaning forward

When you lean forward, as shown in the picture,

there is little movement in your lower back,

but instead the area where your pelvis connects to

your thighs moves, allowing you to bend down.



thin muscle layer in women

The upper trapezius muscle contracts to raise

the arm, but the thickness of the contracted muscle

does not appear as prominent as it does in men.

This is a form in which

the breasts sag in the

direction of gravity.

오답노트 waist movement

If the pelvic tilt is fixed and the

waist is bent, it is an incorrect movement.

When you bend your back, your hip joint

moves first before your lower back bends.

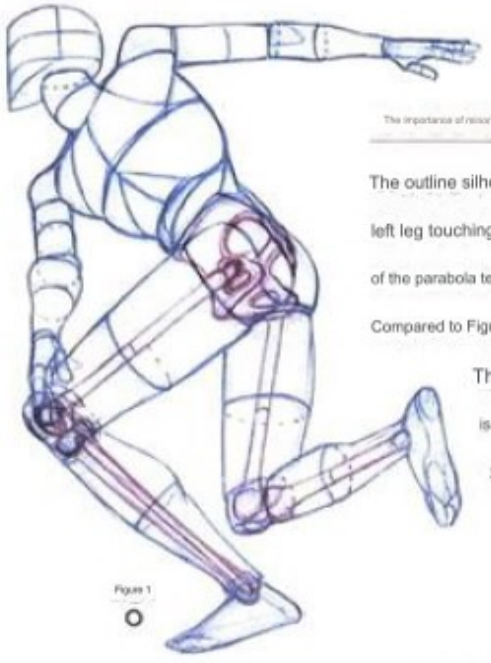


Figure 1

The importance of minor axis direction

The outline silhouette in Figure 1.2 is the same, but the parabolas of the left leg touching the floor are drawn in opposite directions. The direction of the parabola tells the direction of the leg, as shown in Figure 2.

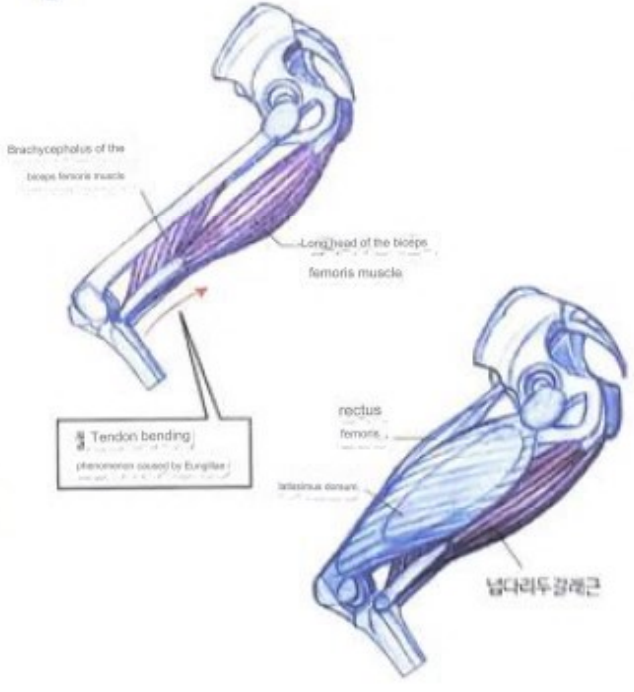
Compared to Figure 1, the direction of the parabola

The posture is wide open and unstable.

is important in this diagram with the legs facing outward.

Since it contains information, it must be drawn carefully.

Figure 2



Biceps femoris and family

Observe how much of the biceps femoris muscle is obscured by the latissimus femoris muscle when viewed from the side. Because the short branch of the biceps femoris muscle pulls on the tendon, the tendon of the biceps femoris muscle bends. Check out the curved shape of the tendons behind your family members' knees now!

Seams of the arms and torso of men and women

When the arms are extended backwards, wrinkles are created in men's armpits due to overlapping muscles, and in women, wrinkles are created due to overlapping skin and fat.

lines on the buttocks

The left hip, where the legs are stretched forward, is pulled, so the hip line is not visible, and the right hip, where the legs are bent backward, overlaps the flesh of the thighs and buttocks, creating a line.

The flow of the men and women's bodies seen from behind

In men, the flow of the buttocks is straight due to the influence of muscles, while in women, fat accumulates to create a round flow.

In men, the back muscles stand out, while in women, only the shoulder blades and spinal flow are visible. When drawing a woman's breasts, first calculate the position of the center line of the torso and draw both breasts symmetrically.

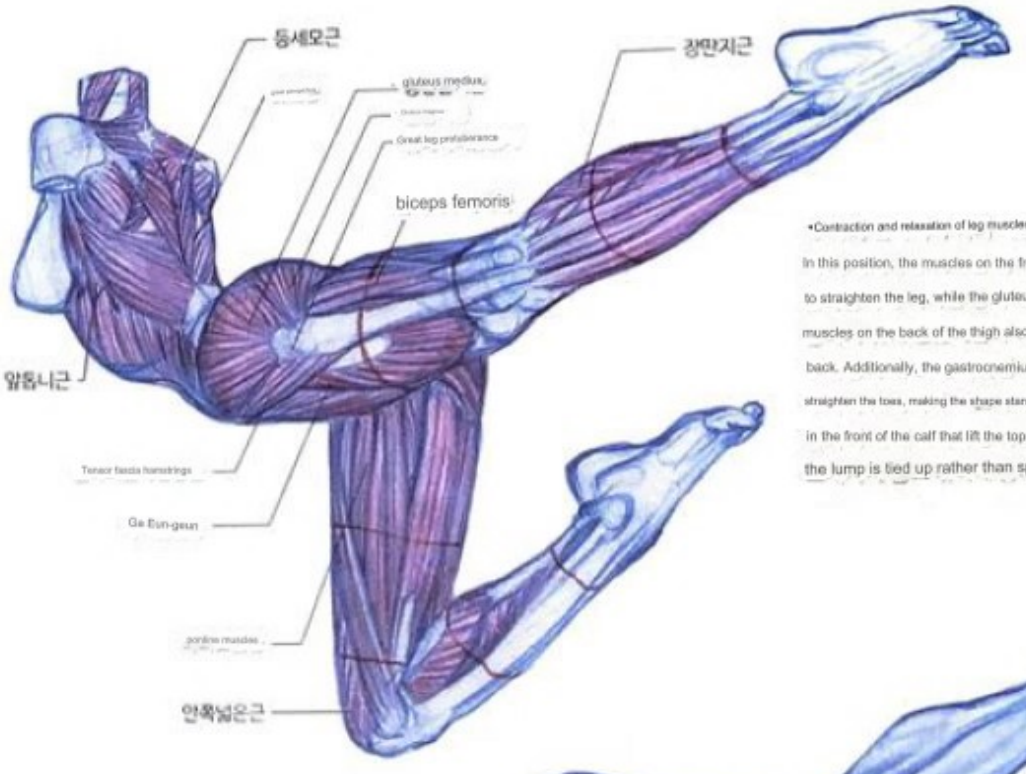
Gap between muscles

When force is applied to the leg, the hollow gap between the hip band and the biceps femoris becomes exposed.

■ stretching posture

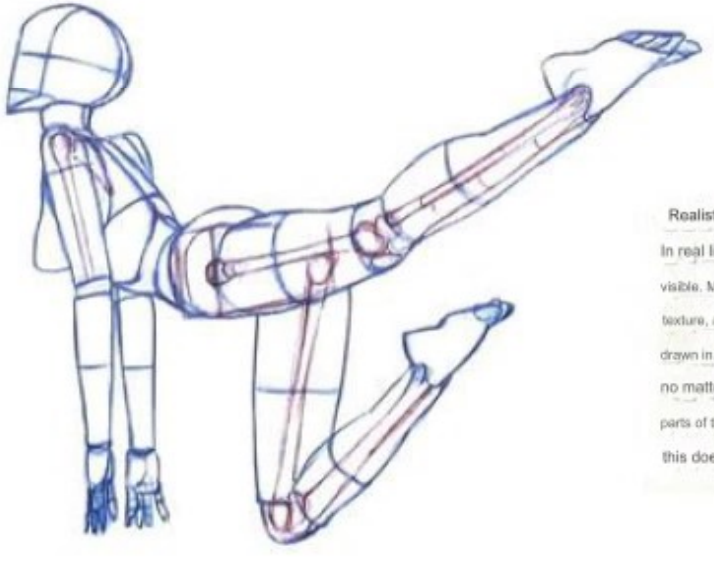
Learn which muscles contract and relax

The weight of the body is supported by both hands and right knee, and the left leg is stretched backwards as hard as possible, stimulating the erector spinae and biceps femoris muscles. This movement, often performed in yoga or aerobics, improves the elasticity of the buttocks by strengthening the spinal column and gluteus maximus muscles. It is a posture that combines the flexibility of an arched back and the tension of powerfully extended legs.



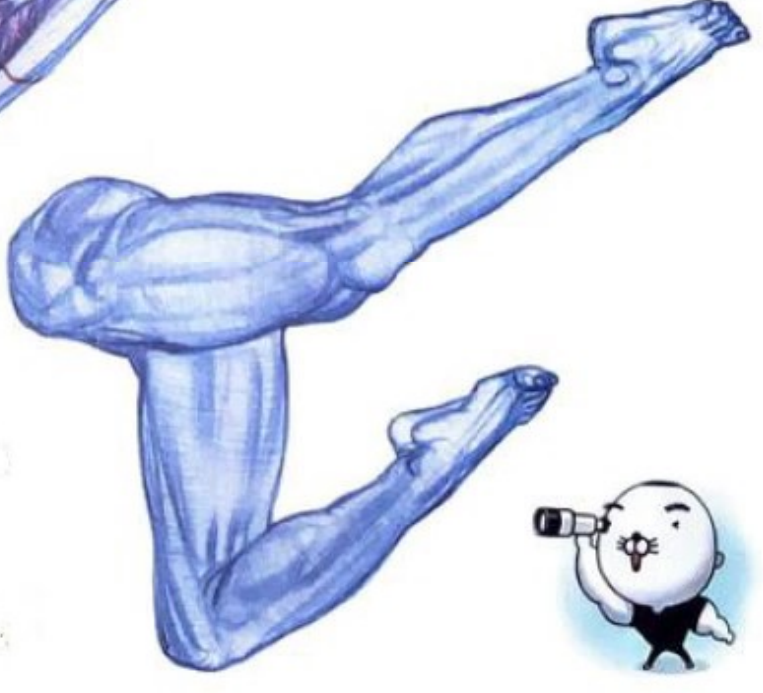
•Contraction and relaxation of leg muscles

In this position, the muscles on the front of the thigh contract to straighten the leg, while the gluteus maximus and the muscles on the back of the thigh also contract to lift the leg back. Additionally, the gastrocnemius muscle contracts to straighten the toes, making the shape stand out. Because the muscles in the front of the calf that lift the top of the foot are relaxed, the lump is tied up rather than split.



Realistic muscle depiction ▶

In real life, not all of the muscles shown in the anatomy data are visible. Muscles in areas where strength is applied must be drawn with texture, and muscles in areas where strength is not applied should be drawn in large chunks rather than splitting the texture. Therefore, no matter what posture you draw, you need to know which parts of the body apply force and which areas do not. do. Of course, this does not apply to characters with little muscle or thick fat layers.

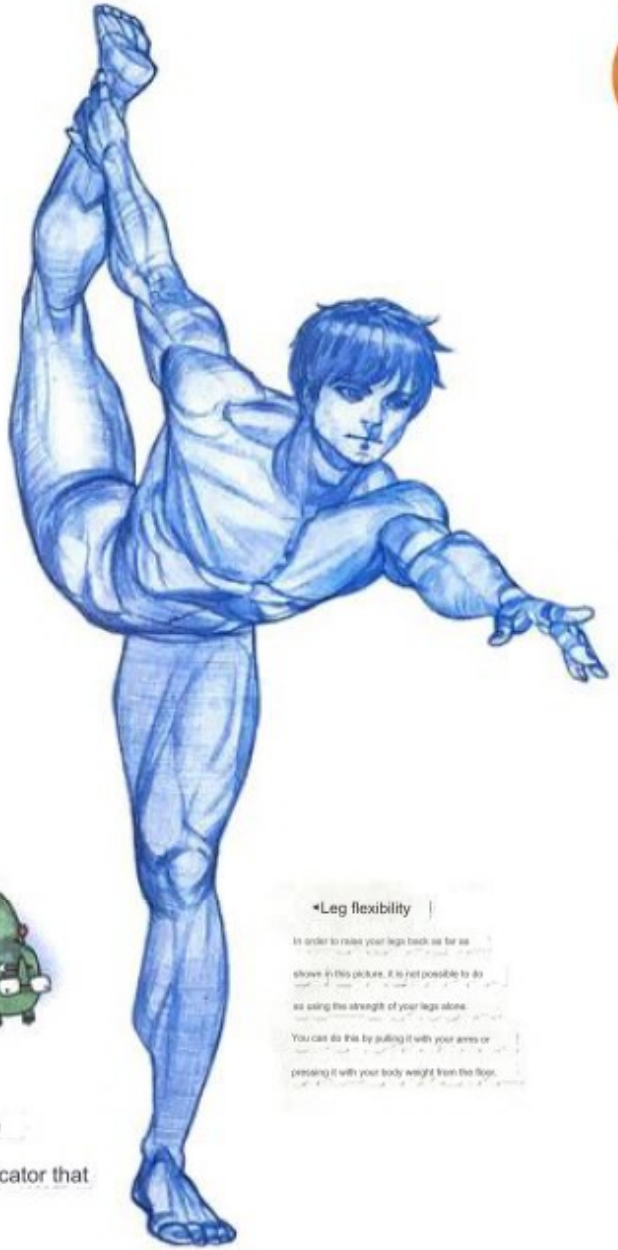


women's wrinkles

Women have a layer of fat all over their body due to female hormones, so their skin is softer than men. This layer of fat between the muscles and the skin creates thicker wrinkles than in men when they form.

Expressing posture through perspective

This is an angle that expresses posture solely through differences in the size of perspective. You can see how important it is to calculate the size of each part according to perspective.



Leg flexibility

In order to raise your legs back as far as shown in this picture, it is not possible to do so using the strength of your legs alone. You can do this by pulling it with your arms or pressing it with your body weight from the floor.

Labo Wrong expression of wrinkles

If you omit where the wrinkles should be, the surface of the body becomes flat and information about how much it is bent is lost. Conversely, if the wrinkles are drawn too long compared to the degree of bending of the joints, the limbs will look cut off or the joints will look poor. The direction of the wrinkles is as important as the length of the wrinkles, so pay close attention to them on a daily basis.

Information that can be learned from wrinkles that appear on the skin

The expression of wrinkles on the skin indicates the elastic texture of the skin. It can also be an indicator that the relevant area is folded or bent.

■ Posture with the body twisted backwards

men's back movements

The poses on this page are difficult poses in which the waist is bent backwards and twisted to the side at the same time. The middle part of the torso box is greatly deformed.

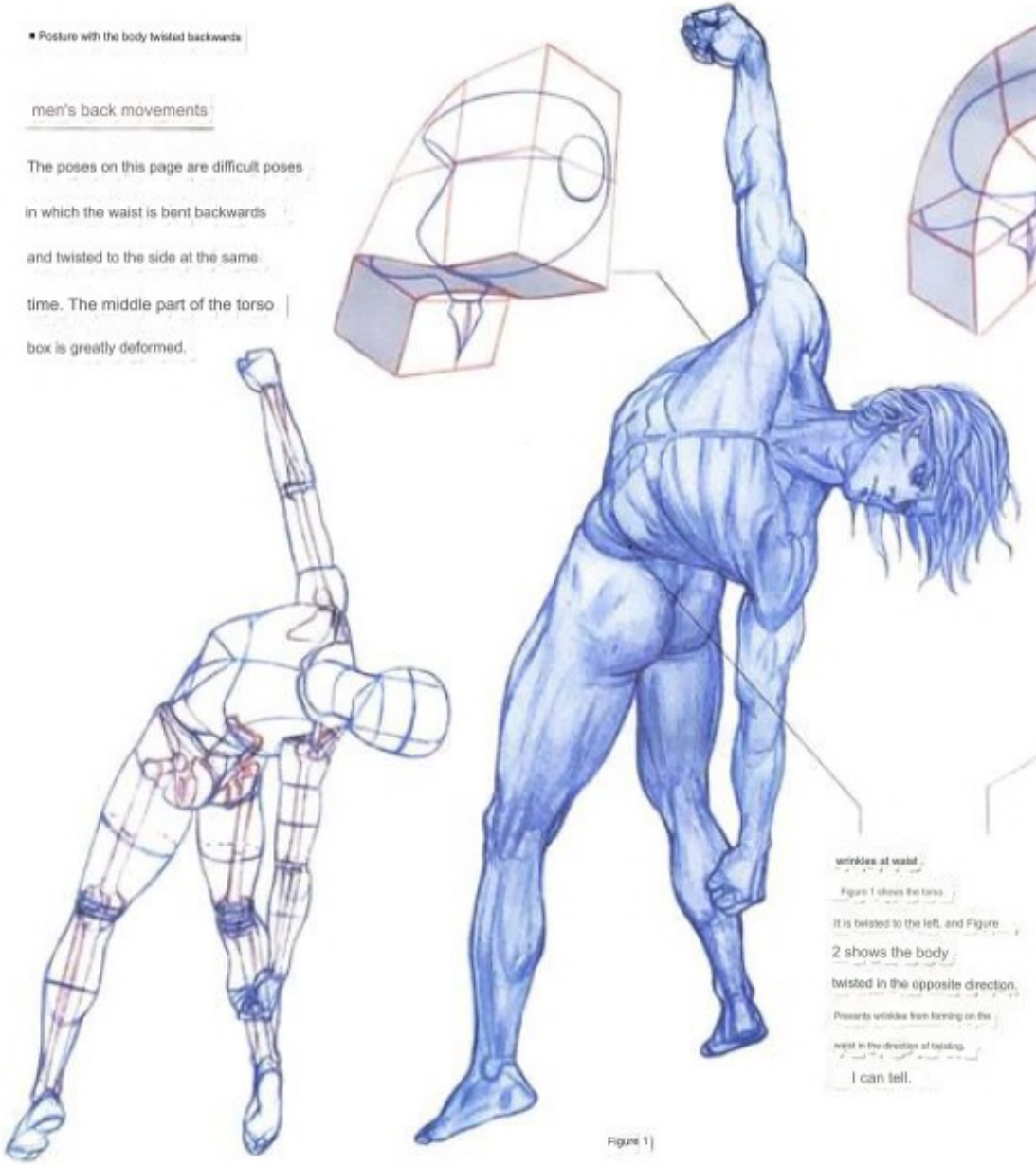


Figure 1

wrinkles at waist

Figure 1 shows the torso it is twisted to the left, and Figure 2 shows the body twisted in the opposite direction. Prevents wrinkles from forming on the waist in the direction of twisting. I can tell.

serratus anterior

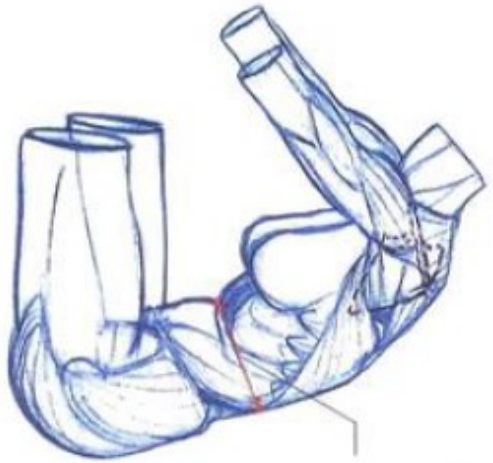
Depending on the posture of the arm, the shoulder blade moves around the clavicle. Since most back muscles attach to the shoulder blades, the position of the shoulder blades is the most important indicator when drawing the back. As shown in the picture below, the serratus alveolar muscle is also affected by the shoulder blade, so to draw the serratus anterior muscle, you need to know the exact location of the shoulder blade.

Figure 2

■ Women's waist movements

female waist characteristics

Women have smaller waists and more flexible waist movements than men. Unless you are trying to draw a muscular female character, omit the expression of the rectus abdominis, latissimus dorsi, and serratus anterior muscles to preserve the unique female flow.



The part where the ribs of a woman's back bends forward is the thinnest part of the waist, and horizontal wrinkles appear along this line.

women's heungbu line

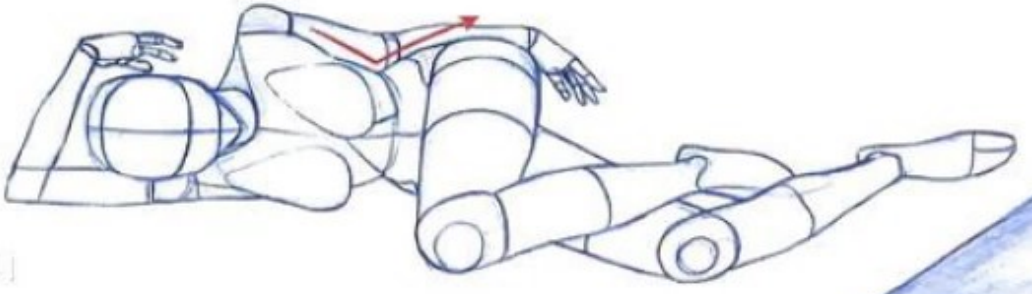
When a woman leans back, her ribs are clearly exposed, and the lines of each rib stand out. This phenomenon occurs because the muscles are thinner than men, and this contrast is often mistaken for the serratus anterior and external oblique muscles, but this is caused by the ribs.

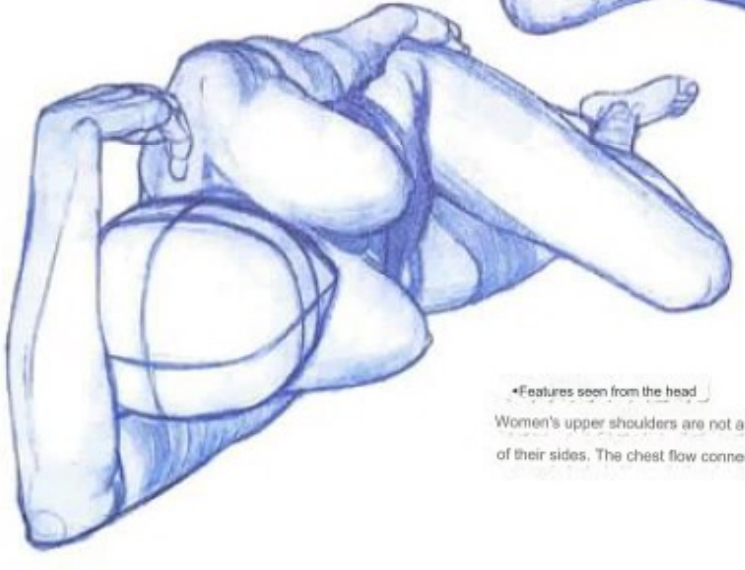
■ side lying position

The flow of a woman's body

As shown in the picture, when a woman lies on her side, the V-shaped line that goes from the ribs to the pelvis is the symbolic flow of a woman.

Additionally, when the human body is stacked, the muscles have less volume, so the arms and legs overlap flexibly.





•Features seen from the lower body•

This angle highlights the woman's voluminous buttocks and soft leg lines. The lower body line, covered with fat over a thin muscle layer, is smoothly connected to the pelvis, revealing feminine features.

•Features seen from the head

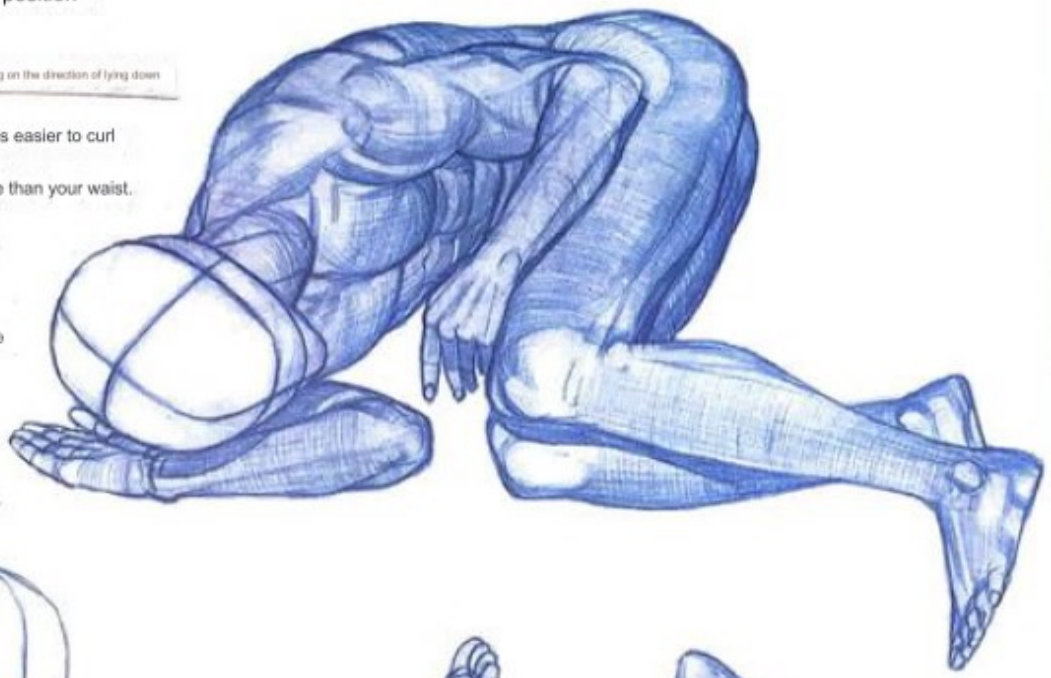
Women's upper shoulders are not as thick as men's, and their arms rest in the bending flow of their sides. The chest flow connected from the shoulder sags downward due to gravity.

Crouching or prone position

Movement of legs and waist depending on the direction of lying down

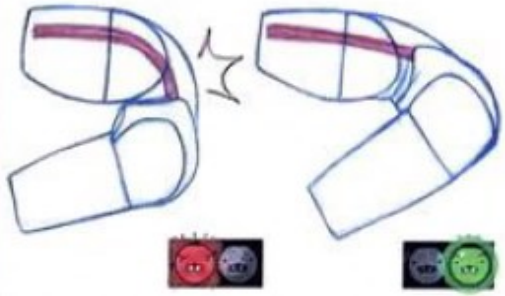
When lying on your side, it is easier to curl up, with your legs bent more than your waist.

When raising the upper body while lying down, the position of the lumbar spine must be well understood to draw the correct flow of the human body.



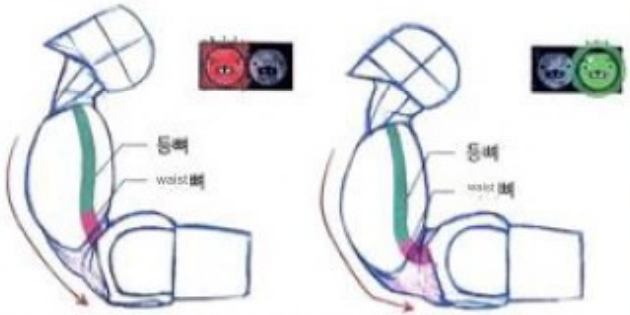
Women have more prominent gastric iliac spines than men.

오답노트 When bending forward



When curling forward, be sure not to bend your lower back excessively as shown in the picture below. This is an angle that exceeds the limit of movement of the spine.

오답노트 When you lean back



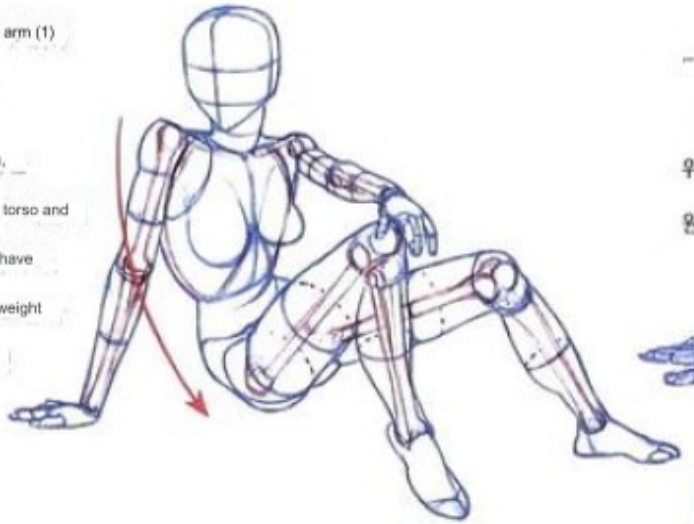
Since the lower back moves around the lumbar vertebrae, you must know exactly where the spine is and where it bends. In the case of the wrong answer picture, the lower back is not curved, but the area where the lumbar bone and sacrum are connected has moved. Correct answer: Your lumbar spine should be curved as shown in the picture. The flow of the torso changes depending on how you understand the movement of the lumbar spine.

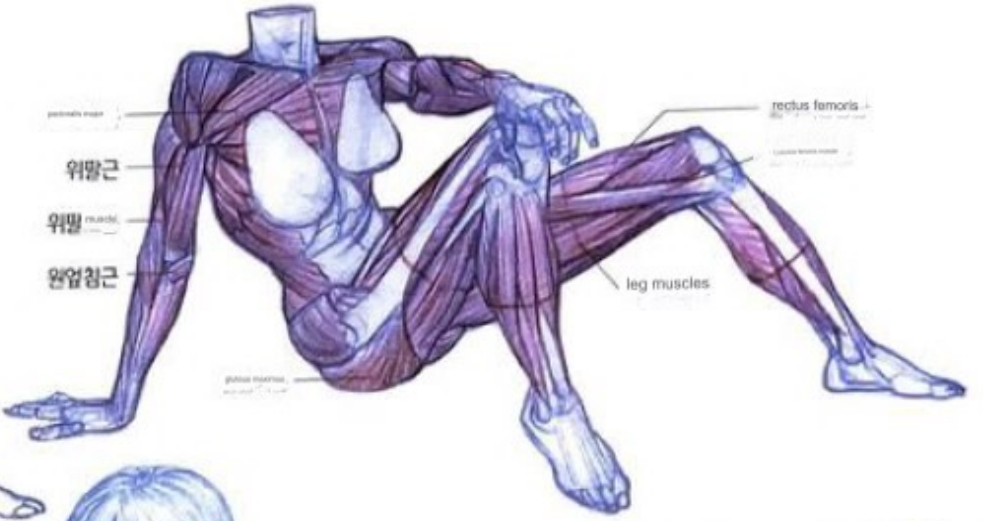
2 Various sitting positions

■ Sitting position, leaning on one arm (1)

Characteristics of a comfortable sitting posture

In a comfortable sitting position, your lower back is relaxed, so your torso and pelvis form a C shape. If you don't have a wall to lean against, support the weight of your upper body by leaning on your arms as shown.





오답노트 arm supporting weight

When sitting on one arm, the expression of the shoulder on the side carrying the weight is important. It's like when you stand cross-legged, the pelvis on the side of the leg carrying the weight rises. However, unlike the pelvis, the shoulder has many joints, so it has a variety of movements. As we learned in diagramming, the shoulder rises in a curve along the clavicle based on the sternojoint plane. As shown in the picture above, if there is no shoulder movement on the arm carrying the weight, gravity or the weight of the body is not felt, making it look like a toy.

In a sitting position, the ischium of the pelvis creates the thickness of the buttocks.

About shortening

To shorten the complex human body, do not try to express it in a polarized form from the beginning, but first express perspective with simple shapes. After that, muscles with similar flow are grouped together on the shape and overlapped as shown in the picture on the left.

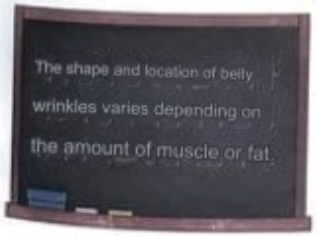
Figure 1

Figure 2

Location of abdominal wrinkles in men

If you look at a man with a muscular body as a standard, if you bend your body even slightly, wrinkles form along the line where the ribs end, as shown in Figure 1. If you bend your back further, as shown in Figure 2, a second crease will appear in the upper anterior

Iliac spine line.

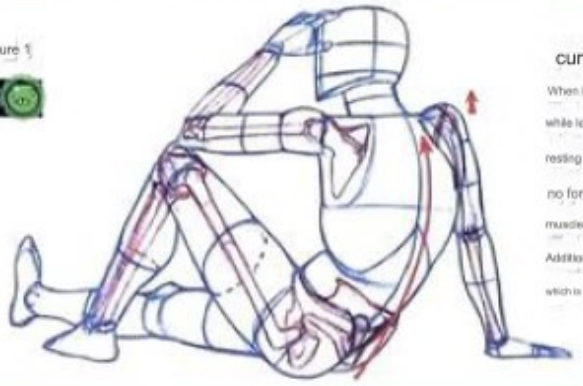


Observe how the arm anatomy information is applied to the shortened flow of the actual arm.

■ Sitting position, leaning on one arm (2)

오답노트 Spinal flow in sitting position

Figure 1



curved spine flow

When looking from behind

while leaning on one arm, in the

resting position, as shown in the picture,

no force is applied to the spinal cord

muscles, and the flow of the spine is curved.

Additionally, the right horse's shoulder,

which is carrying the weight, is raised.

Figure 2

straight spine flow

This is because the flow of the spine

If you look, it's not leaning on one arm

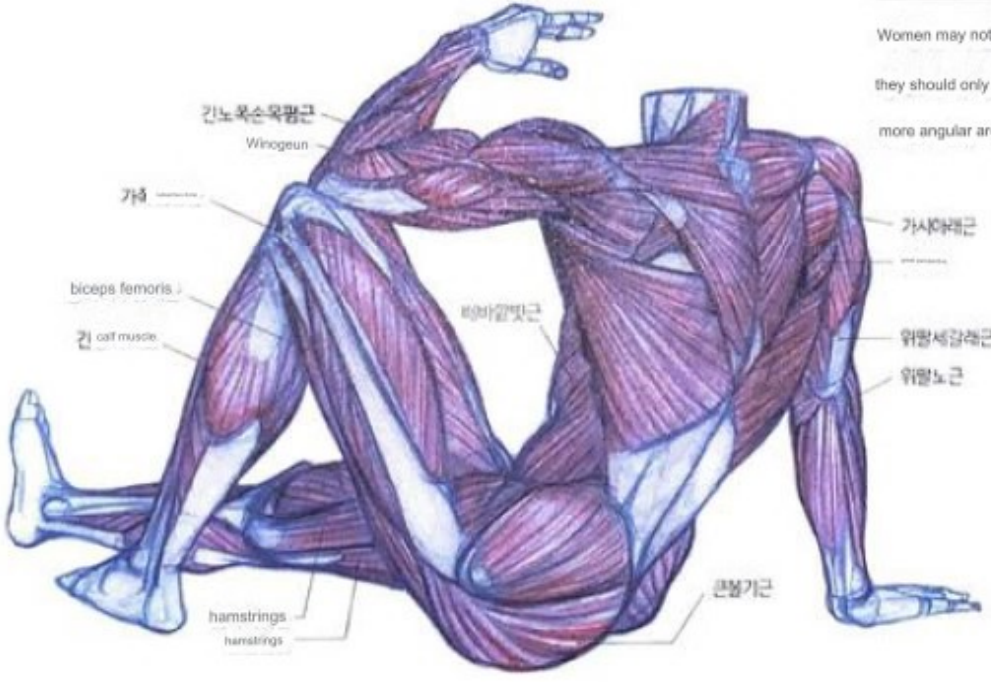
disappears when you sit with your

I feel like I'm sitting against a wall.

The reason why Figure 2 looks more static than

Figure 1 is because of the curve of the waist.

back in a straight line (Figure 2).



Shoulder blade and spinal process

Women may not consider bones important due to the prejudice that

they should only be drawn with curves, but in reality, there are

more angular areas due to bones than you might think.

Differences in flow between men and women bending at the waist

Unlike women, men have an iliac ridge at the waist.

A line is created as a border. As a result, when men bend their backs, the flow changes twice around the end of the ribs and the iliac ridge, while for women, the flow changes once around the end of the ribs.

Butt ridge

Let's observe the tilt of the shoulders and pelvis, which cannot be seen from the side, from a high angle.

Contraction of the quadriceps brachii muscle (strength is applied to the quadriceps brachii muscle to prevent the arm supporting the weight of the upper body from bending).

■ Sitting position with the upper body turned to the side

position of both shoulders

The right arm supports the weight of the upper body, and the left arm acts as a balance. The right shoulder carrying the weight rises, and the left shoulder fan is pulled along the arm. Observe the asymmetrical position of both shoulder blades.

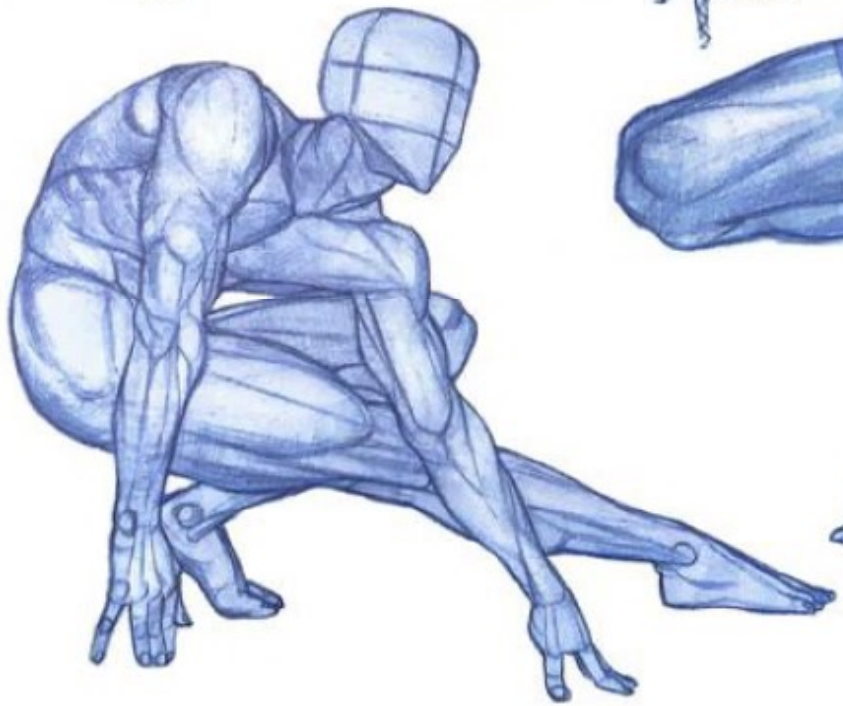
The proportion of weight supported by a horse

The end line of the anterior thigh muscles

When the right leg is stretched out, the muscles in the front of the thigh contract, making the boundary between the knee and the muscles clear. On the other hand, the muscles of the left thigh when the leg is bent are relaxed, so the knee area is connected to the knee through a round flow.

Analyzing posture from the side

• This picture shows the posture on the left page viewed from the side, showing the difference in tilt between both shoulders at a glance. The right arm with the shoulder raised acts as a support, and the left arm with the shoulder lower acts as a balance rather than supporting the weight. Therefore, even if the left arm does not touch the floor, it does not affect the center of gravity. In the case of the lower body, the bent left leg supports the weight, and the long extended right leg holds the center of gravity.



•Points when drawing the back

From this angle, where you can observe the entire back muscles, you can find the position of the shoulder blades through the shape of the muscles. To draw the back well, you need to know the location of the shoulder blades where the muscles attach, rather than just practicing the flow of the muscles that are revealed on the surface.

•Role of the arm according to shoulder position

The picture on the left shows the person supporting the weight with his legs and balancing with his arms on the floor. The shoulder of the arm on the floor is pulled forward, showing that the arm is maintaining balance. If the shoulder of the arm on the floor rises, it is supporting weight. The position of the shoulder varies depending on the role of the arm, so you must position your shoulder according to your intended posture.

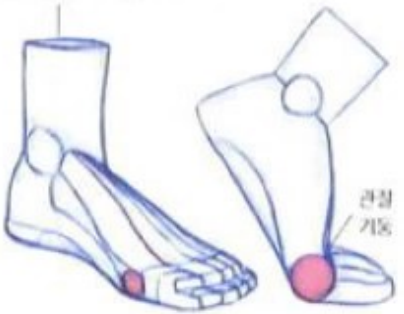
Untangled horse muscle flow

■ Sitting position with one knee raised

오답노트 Leg shape in sitting position

If the wrinkles in the area where the leg bends when bent are too deep, as in number 1, the joint area will look poor. Number 2 is the opposite of mistake number 1, and is an incorrect answer caused by not adding pleats in the area where pleats should be added. Since no pleats are added to the back of the knee, it feels like a rubber material. Like number 2, it is drawn with one toe covering all the remaining toes, is a common mistake made by beginners. Let's take a look at the diagram of the foot structure shown on this page.

Draw a star and understand its structure centered on the trigger ridge.



• (Understanding the basic shape and movement) of the foot To understand the overall shape of the foot, think of a foot wearing socks rather than a bare foot. If you have become somewhat familiar with the flow of socks, refine the shape little by little by dividing the angles around the instep ridge as shown in the picture on the left. . For the toes, put all five toes together and start by moving them up and down around the joint pillars.

Characteristics of a woman's shoulder: The shoulder of the arm that touches the floor rises, and the outline of the bone in the shoulder area stands out.

The fleshy female hormones behind the forearms have the function of forming a thin layer of fat all over the body and making the muscles soft. This is also the reason why fat lumps form on the backs of women's forearms.

Direction of the lateral thigh line

When you bend your leg, the thigh line points toward the head of your fibula.

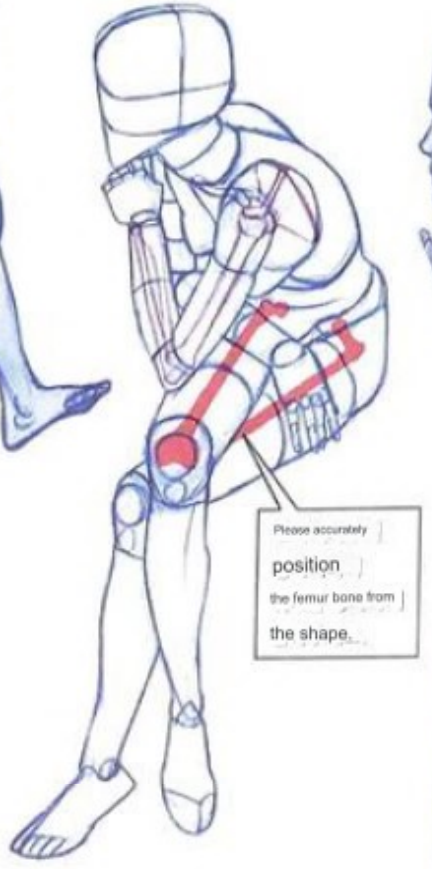
Center of gravity in sitting position

When you sit on your butt, the area in contact with the floor is wider than when you stand on both feet, so it is relatively easier to balance your center of gravity. As shown in the picture on the right, when you place your arm on the floor, the shoulder on the side carrying the weight should rise. Observe the position of your shoulders through the pictures on this page.

The reason it hurts when a skinny person with no fat on the buttocks sits on one's lap is because of 'buttocks'!

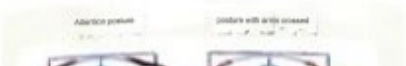
Characteristics of a woman's sitting posture: Women tend to have a lot of fat on their buttocks, which spreads to the side when they sit.

■ Legs and arms crossed posture



Characteristics of shape when legs are crossed

In this position, where both legs are crossed as close as possible, the pelvis and the flesh of both thighs are pressed against each other, causing a change in the shape of the thighs. In postures that place excessive pressure on the skin, such as crossing your legs or crossing your arms, the degree of change in silhouette can only be calculated using the internal skeleton as a standard. If you do not consider the skeleton, the drawing will look like the bone is dislocated or bent, so be careful.

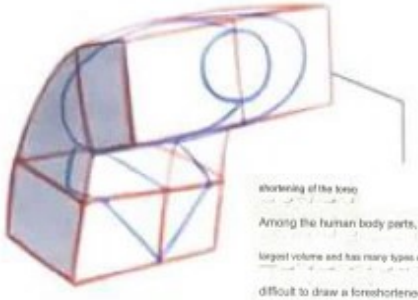


When you cross your arms, not only do you move your arms, but your shoulders move forward as shown in the picture above.

Shape where the arms are close to the body and the skin overlaps

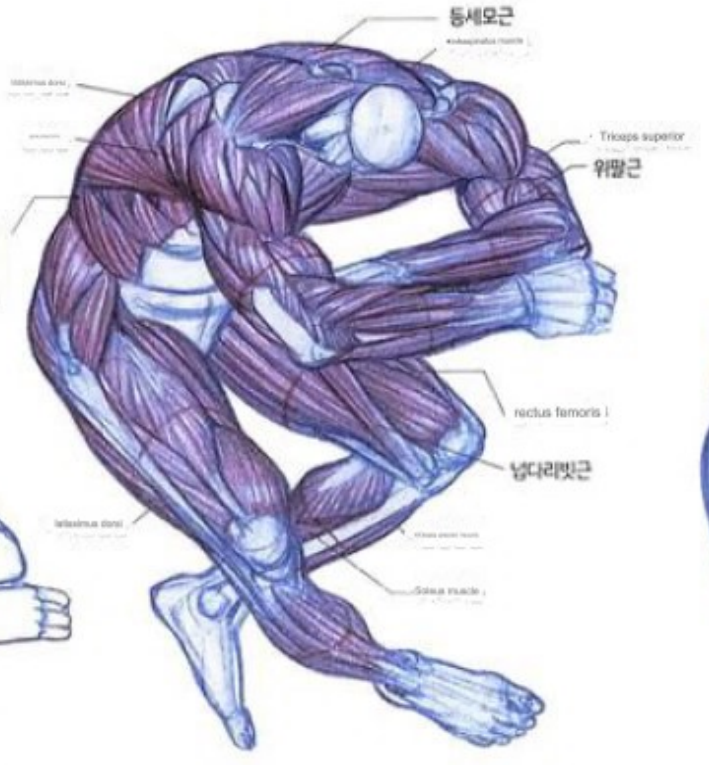
When looking at the posture with the shoulders raised from the side, in women, the flow of the chest flows down from the shoulder, and in men, the thickness of the contracted pectoralis major muscle becomes more prominent, and the boundary between the deltoid muscle and the pectoralis major muscle is divided. In women, the protruding shoulder blades affect the flow of the back, and in men, the teres major and teres latli affect the flow of the back.

■ sitting posture on a chair



shortening of the torso

Among the human body parts, the torso has the largest volume and has many types of muscles, making it difficult to draw a foreshortened figure.



Two postures for sitting on a chair

Figure 1 shows the same flow as the postures on this page, with the person sitting with their back bent forward and their arms supported on the desk.

Figure 2 shows a sitting position with your hips forward and your back leaning against the back of a chair. There are two main postures for sitting on a chair.

Figure 1

Figure 2

This is a sitting posture with the waist line as shown in Figure 1.

Bones that affect body flow

For both men and women, the back muscles relax when the back is bent rather than when the back is upright, and the spinal process around the neck 7 becomes more prominent. In particular, the bumps of women with less muscle mass appear more prominent.

목뼈 7번

The flow of the waist for both men and women: In men, the external oblique muscle protrudes, and in women, the flow bends from the end of the ribs to the pelvis without the volume of the external oblique muscle.

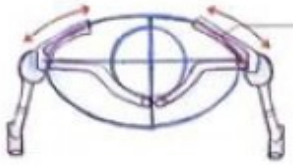
•Draw proportion and volume separately

It is really difficult to draw angles in postures like the picture on the left. For postures or angles that are difficult to draw, I first draw the skeleton, calculate the posture and proportions, and add muscle volume and flow to complete it. By calculating proportion and volume separately like this, complex structures can be expressed more easily.

Drawing blind spots ▲

When drawing areas that are hidden and revealed by overlapping, such as the ankle painted in the green area above, do not position the foot using the steel, but draw the hidden leg during the rough sketch process to position the foot accurately.

■ Posture that emphasizes upper body muscles



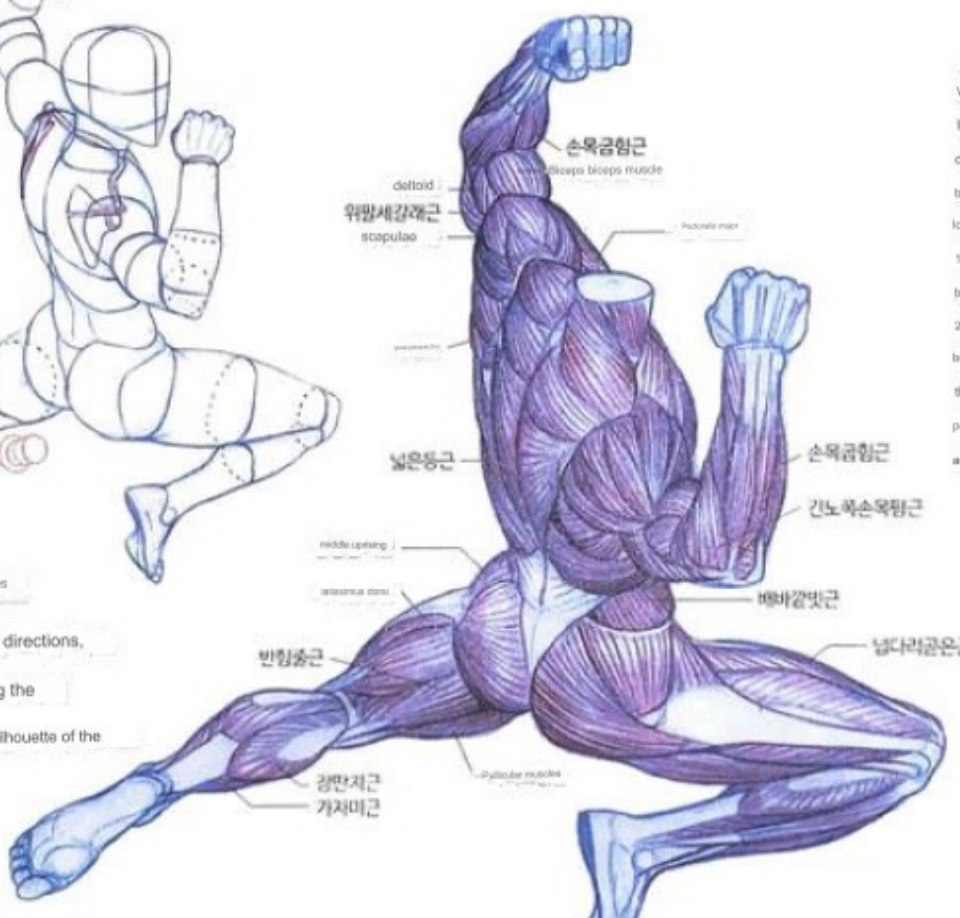
The inner surface of the shoulder blade is not a flat surface. The inner surface of the shoulder must surround the oval ribs, so it has a curved shape rather than a flat surface.

Cylindrical body flow

Even if the muscles on the torso are complex, the basic cylindrical flow must appear. Also, because the shoulder rotates around the cylindrical ribs, at this angle, one shoulder blade passes over to the other side and the width is suddenly shortened.

Recognizing the direction of limbs through shapes

When drawing a pose with complex limb directions, first draw the direction of each part using the parabola of the diagram before drawing the silhouette of the human body. In this pose, it is especially important that the posture of both arms is symmetrical.



When you raise your arms as shown in Figure 1, the pectoralis major and deltoid muscles go behind the body, which is different from the arm-lowering position in Figure 2. In Figure 1, the back muscles and the biceps brachii are contracting, while in Figure 2, the pectoralis major and the biceps brachii are contracting. Let's observe the change in the shape of the pectoralis major muscle when raising and lowering the arm.

Figure 1

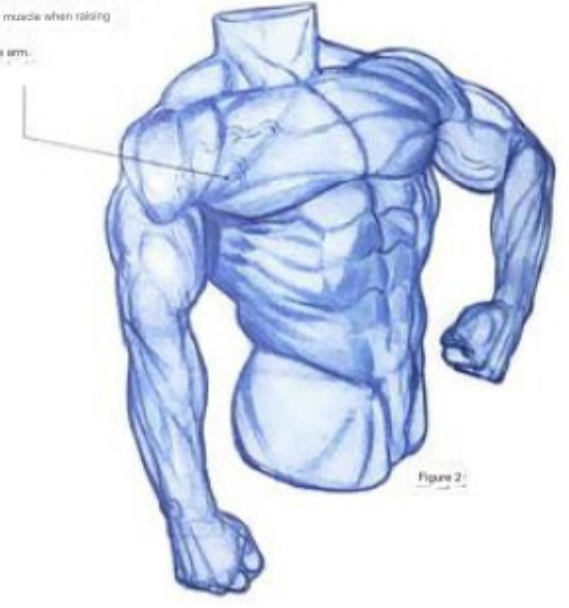
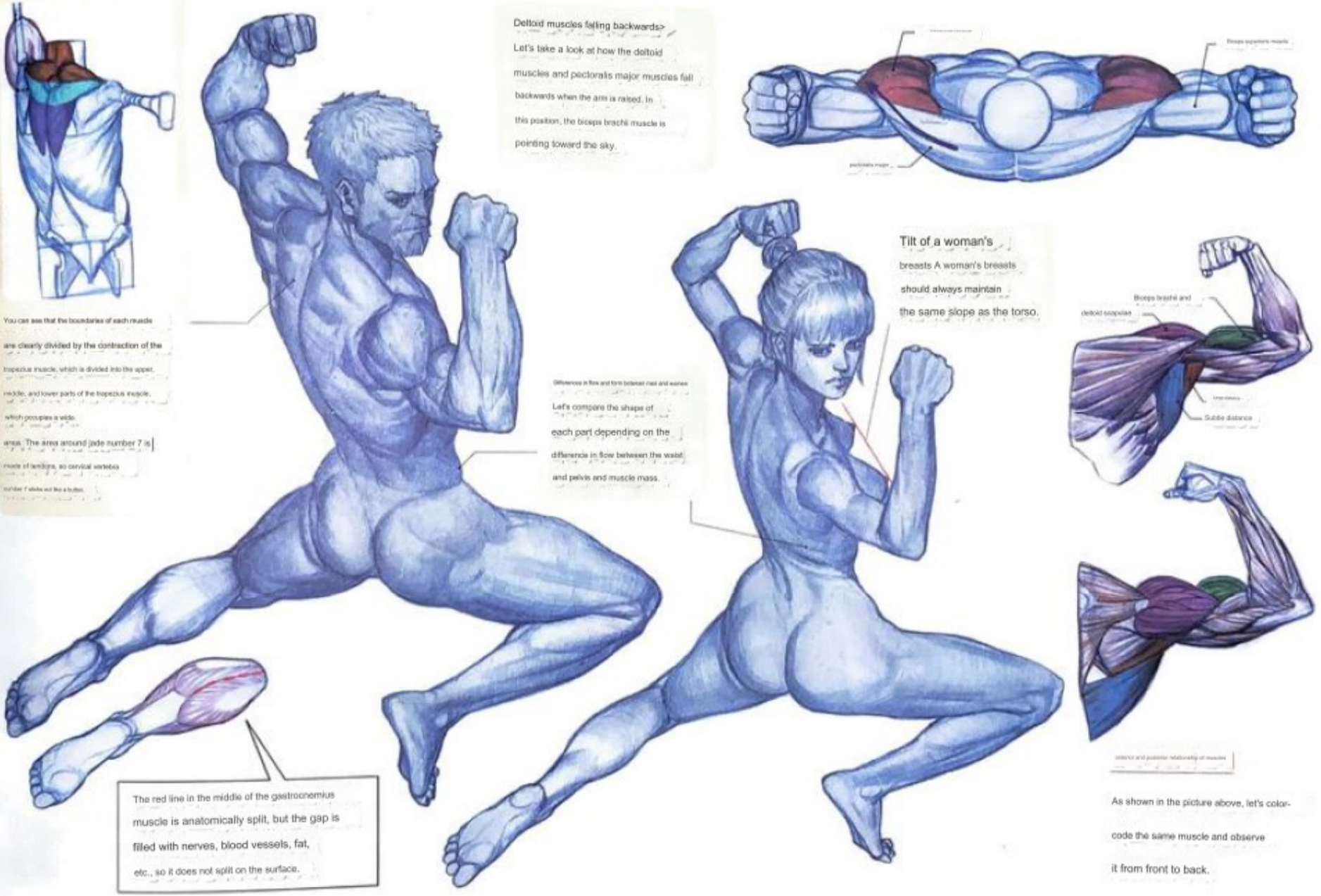


Figure 2

You can see that the boundaries of each muscle are clearly divided by the contraction of the trapezius muscle, which is divided into the upper, middle, and lower parts of the trapezius muscle, which occupies a wide area. The area around jade number 7 is muscle of tendons, so cervical vertebra number 7 sticks out like a button.

Deltoid muscles falling backwards>

Let's take a look at how the deltoid muscles and pectoralis major muscles fall backwards when the arm is raised. In this position, the biceps brachii muscle is pointing toward the sky.



Differences in flow and form between male and women

Let's compare the shape of each part depending on the difference in flow between the waist and pelvis and muscle mass.

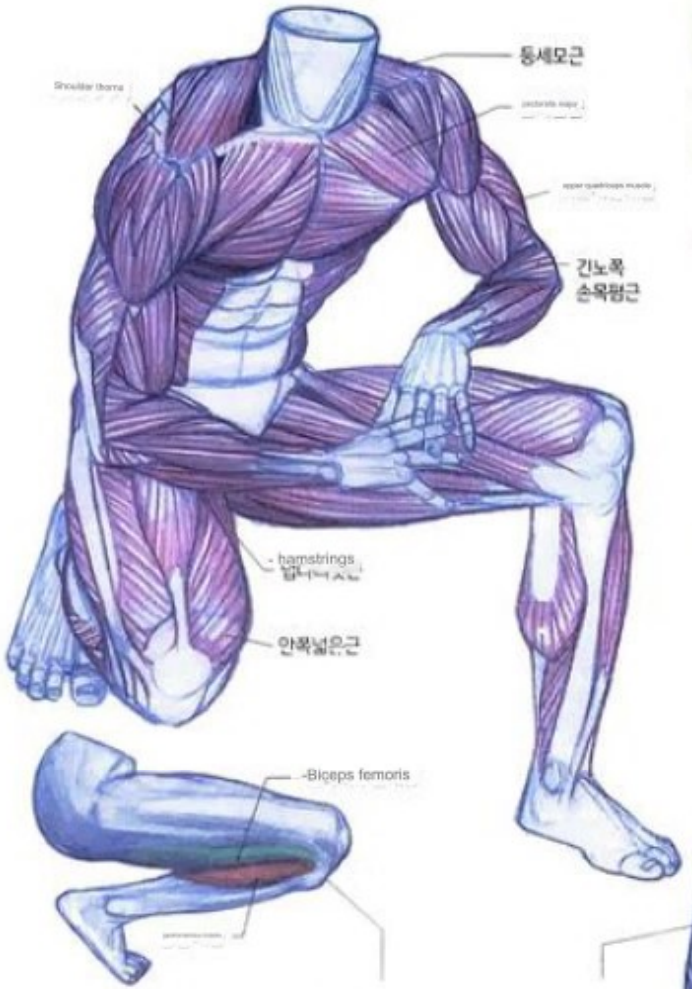
Tilt of a woman's breasts A woman's breasts should always maintain the same slope as the torso.

anterior and posterior relationship of muscles

As shown in the picture above, let's color-code the same muscle and observe it from front to back.

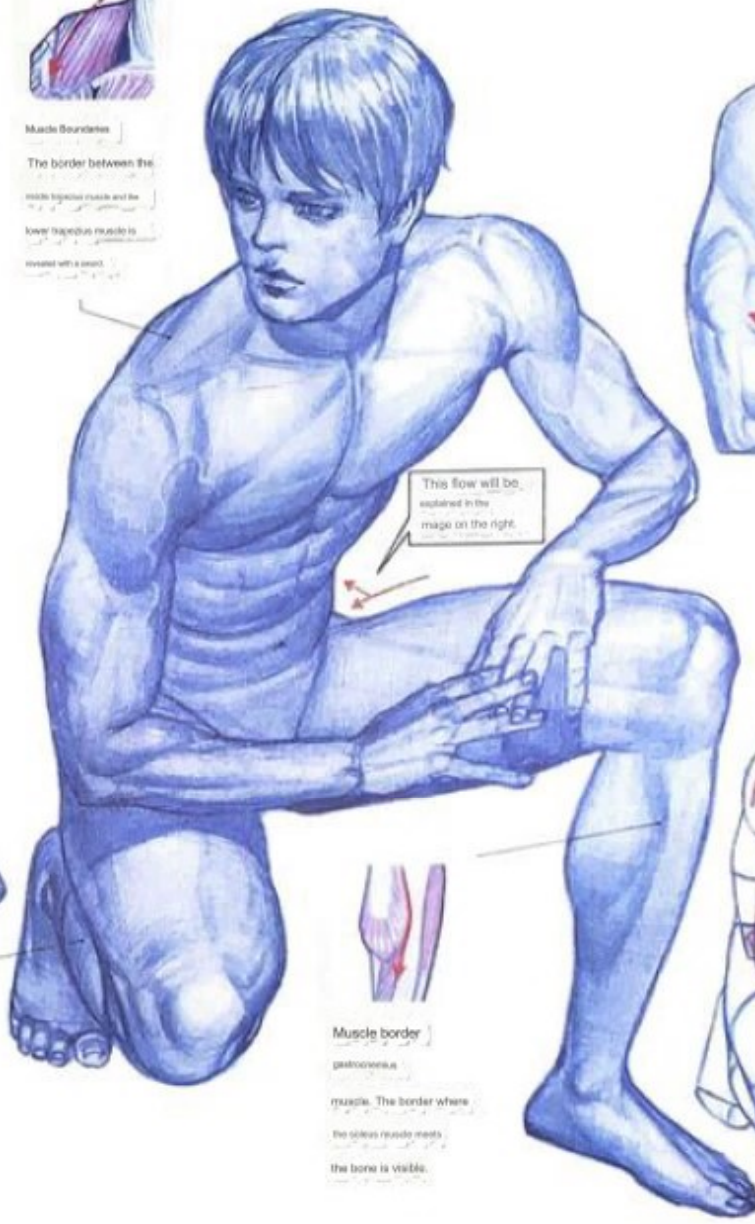
The red line in the middle of the gastrocnemius muscle is anatomically split, but the gap is filled with nerves, blood vessels, fat, etc., so it does not split on the surface.

■ Squatting position with one knee raised (1)



Muscle Boundaries

The border between the middle trapezius muscle and the lower trapezius muscle is revealed with a pencil.



Features of bent legs

When the leg is flexed, the border between the biceps femoris and gastrocnemius muscles is revealed. If you look at it from the side, you can see it more clearly. Women have less muscle mass and are covered with a layer of fat, so the boundaries are not as clear as those of men.

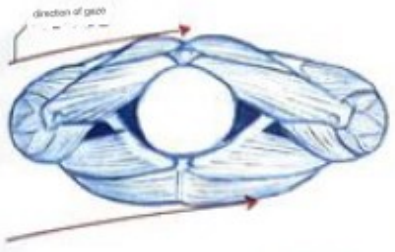
Muscle border

gastrocnemius muscle. The border where the soleus muscle meets the bone is visible.

Direction of wrinkles on bent arms

In arms with large muscle mass, the direction of wrinkles changes when strength is applied and when strength is not applied. A drawing showing only the arm is the direction of the wrinkles when force is applied, and the arm of a person drawn with the whole body is the direction of the wrinkles when no force is applied. Compare the directions of the two wrinkles!

• Squatting position with one knee raised (2)



• Angle where the back and chest are visible at the same time Because we often think of the body as being divided into the front and the back, we may mistakenly believe that we cannot see both sides of the same time. However, because the torso has an overall round shape, an angle is created where the back and chest are visible together from the half side.

Drawing different shoulder positions

To express various shoulder movements, it is better to draw the torso first and then position the shoulders, rather than drawing the arms first. When drawing an arm, draw the correct bones first and then add the muscles, as shown in the picture above.

Changes in flow depending on the angle

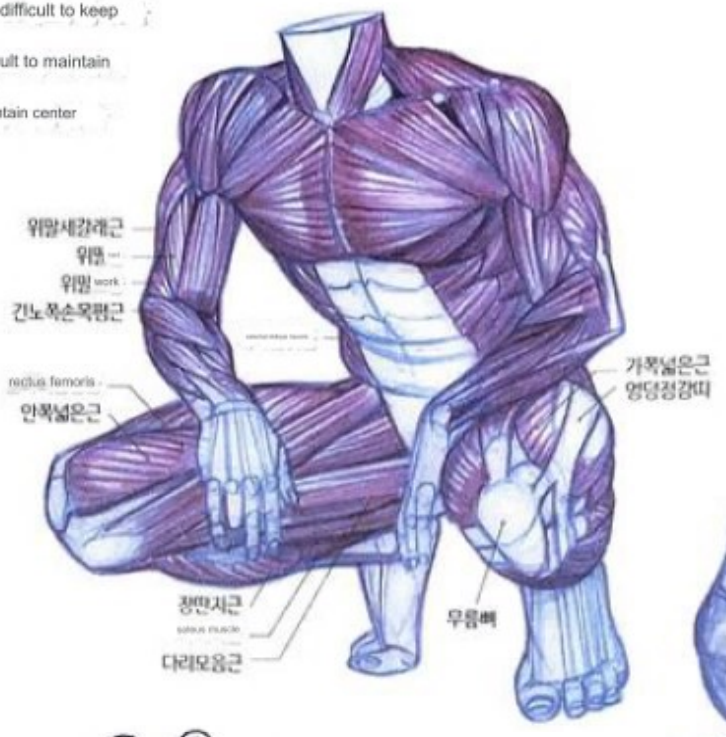
The flow of the pelvic and leg muscles varies depending on the angle. In the picture on the left, flow is created in the direction of the arrow by the gastrocnemius muscle. In the picture below, which is the posture on the left page, the outer silhouette appears differently due to the influence of the tensor hamstrings.

■ Sitting on tiptoe (1)

Center of gravity difficult to adjust

Everyone, please sit on tiptoes. Is it difficult to keep your balance? A posture that is difficult to maintain balance in real life is also difficult to maintain center of gravity in a picture.

그림1



How to maintain a stable center of gravity

In a squatting position, lowering your upper body rather than raising it creates a more stable center of gravity. If you lower your upper body as shown in the picture below, you will naturally place your arms on your legs and your shoulders will rise slightly.

Figure 2X

Two people squatting

The squatting position is divided into two positions: laying down your thighs and standing on tiptoes, like in number 2, or raising your thighs and placing the entire sole of your foot on the floor, like in number 2. Posture 2 is difficult for men to do. Unlike women, whose lower body is heavier than their upper body, men's upper body is heavier, so their center of gravity is tilted backwards and they tend to fall. Figure 2 shows a posture where the center of gravity is incorrect due to the combination of the tip of the tip of one's toes and the tilt of the thigh of number two.

■Sitting on tiptoe (2)

Stable kneeling posture

Than the posture of a woman sitting on tiptoes. A man's posture with three points of contact with the ground is more stable. When expressing this posture in a picture, it is not difficult to maintain the center of gravity. Additionally, because the center of gravity of the lower body is stable, various movements of the upper body are possible, resulting in a variety of applied postures.

오답노트 chest and clavicle

I'm not wearing it

I often draw.

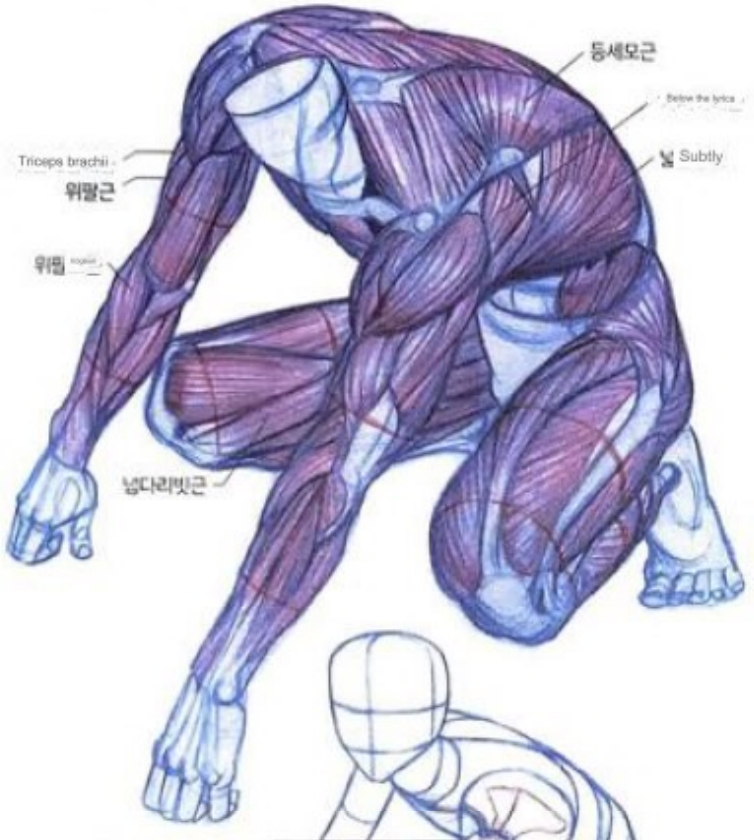
Also from any angle

A common mistake is made by drawing the

Changes in breast shape depending on the direction of gravity

The picture above is of the person bending down with their chest facing down, and the picture on the right is a high angle view from above while standing. When standing, the chest expands radially, but in a bent position, the chest gathers inward according to the direction of gravity compared to when standing.

■ Squatting position with hands on the floor



The position of the clavicle and shoulder blade in the basic shoulder movement position is the path taken forward.

deformed character

When drawing a large character with deformation, rather than vaguely thinking of simply exaggerating the size of the shoulders and upper body, think of mixing it with an existing animal such as a gorilla that is similar to the concept of deformation, and you will get a more concrete form. As shown in the picture above, if you add the flow of the human body to the gorilla's skeleton, it becomes easier to express the deformation in a polarized form.

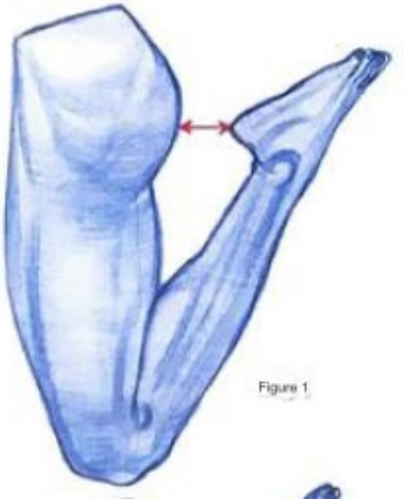
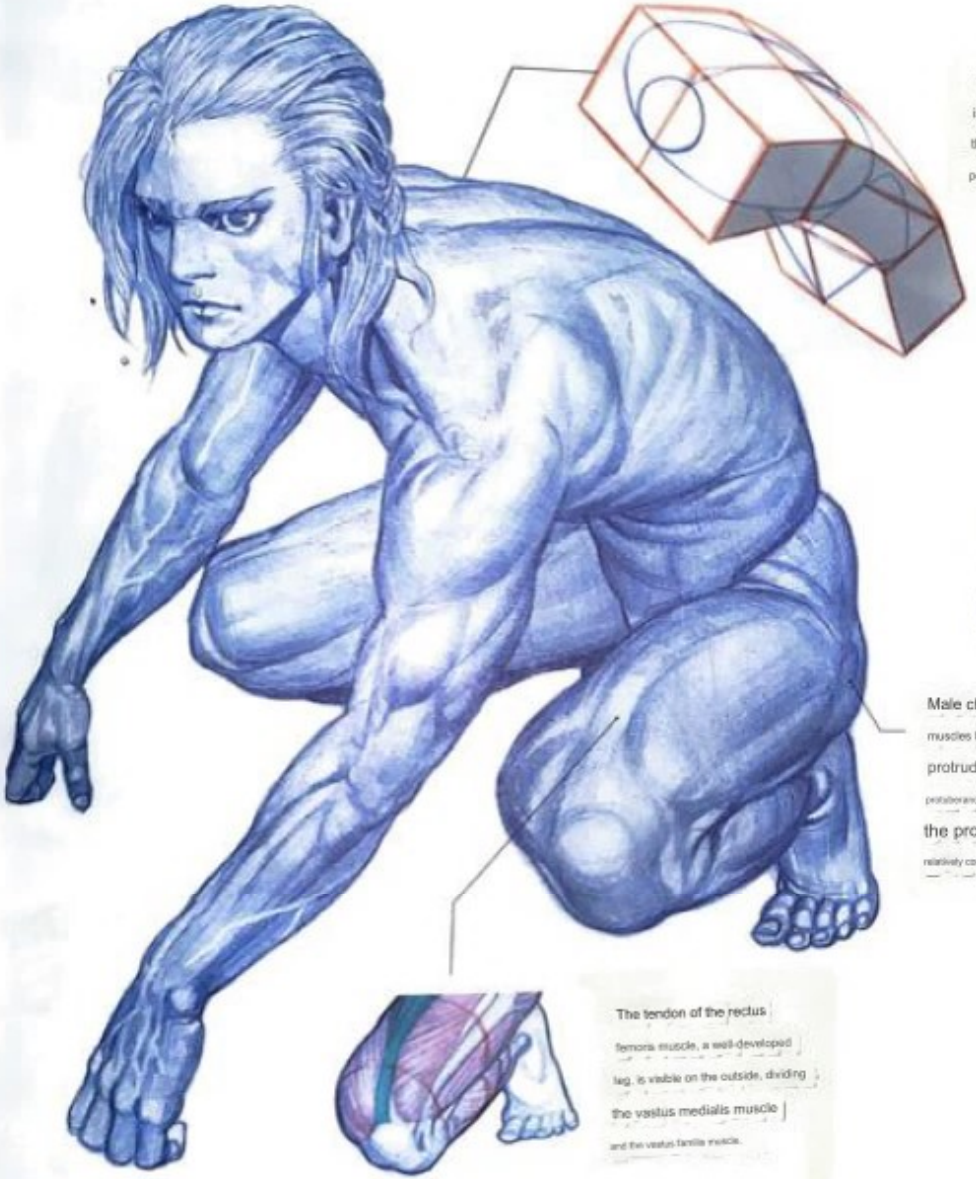


Figure 1

Figure 2

Knee range of motion ▲

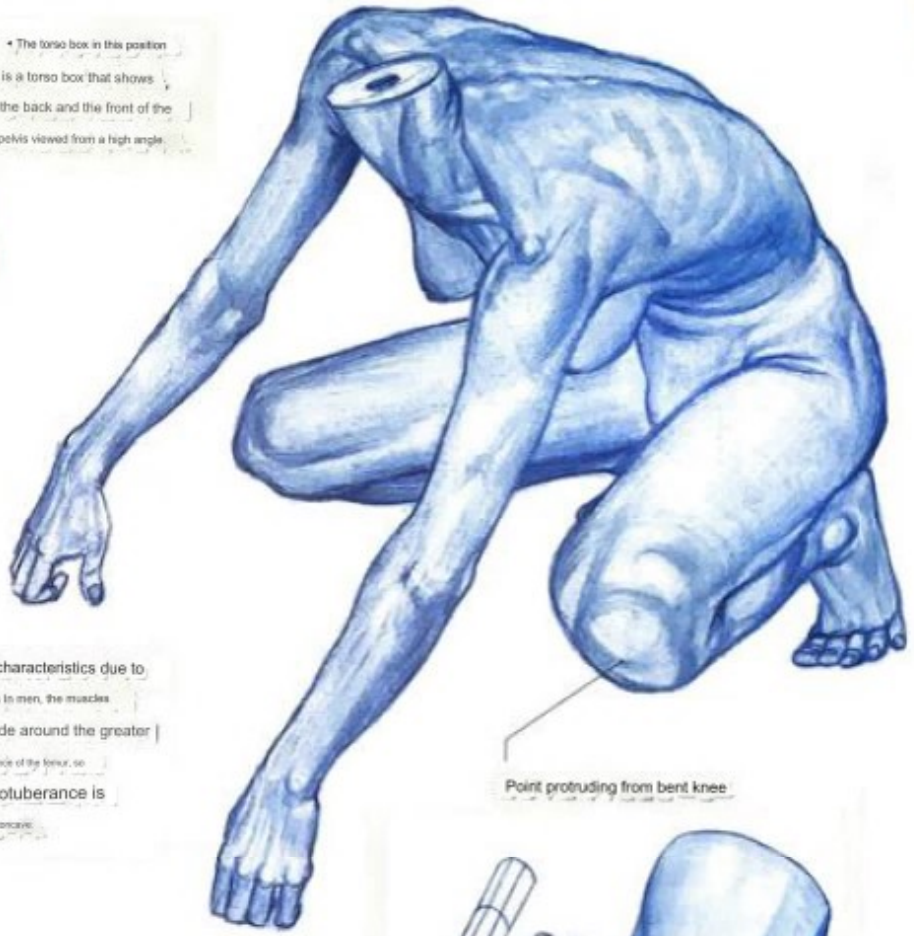
Figure 1 shows the leg bent to its maximum using only the strength of the muscles themselves. In order for your heels to touch your buttocks as shown in Figure 2, you have to sit down with your weight on them or grab your legs and pull them inward.



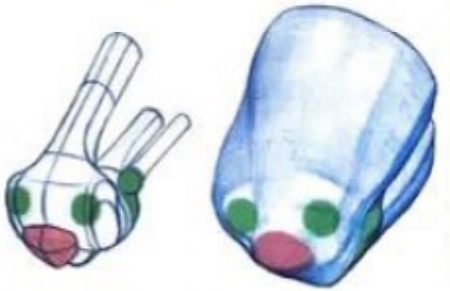
• The torso box in this position is a torso box that shows the back and the front of the pelvis viewed from a high angle.

Male characteristics due to muscles in men, the muscles protrude around the greater protuberance of the femur, so the protuberance is relatively concave.

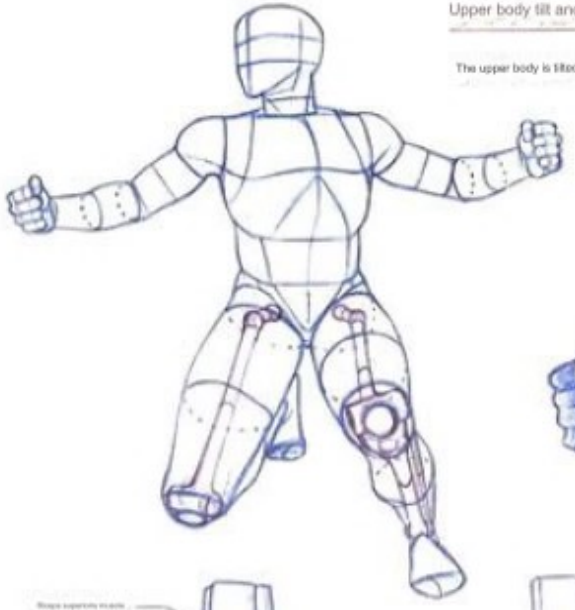
The tendon of the rectus femoris muscle, a well-developed leg, is visible on the outside, dividing the vastus medialis muscle and the vastus lateralis muscle.



Point protruding from bent knee



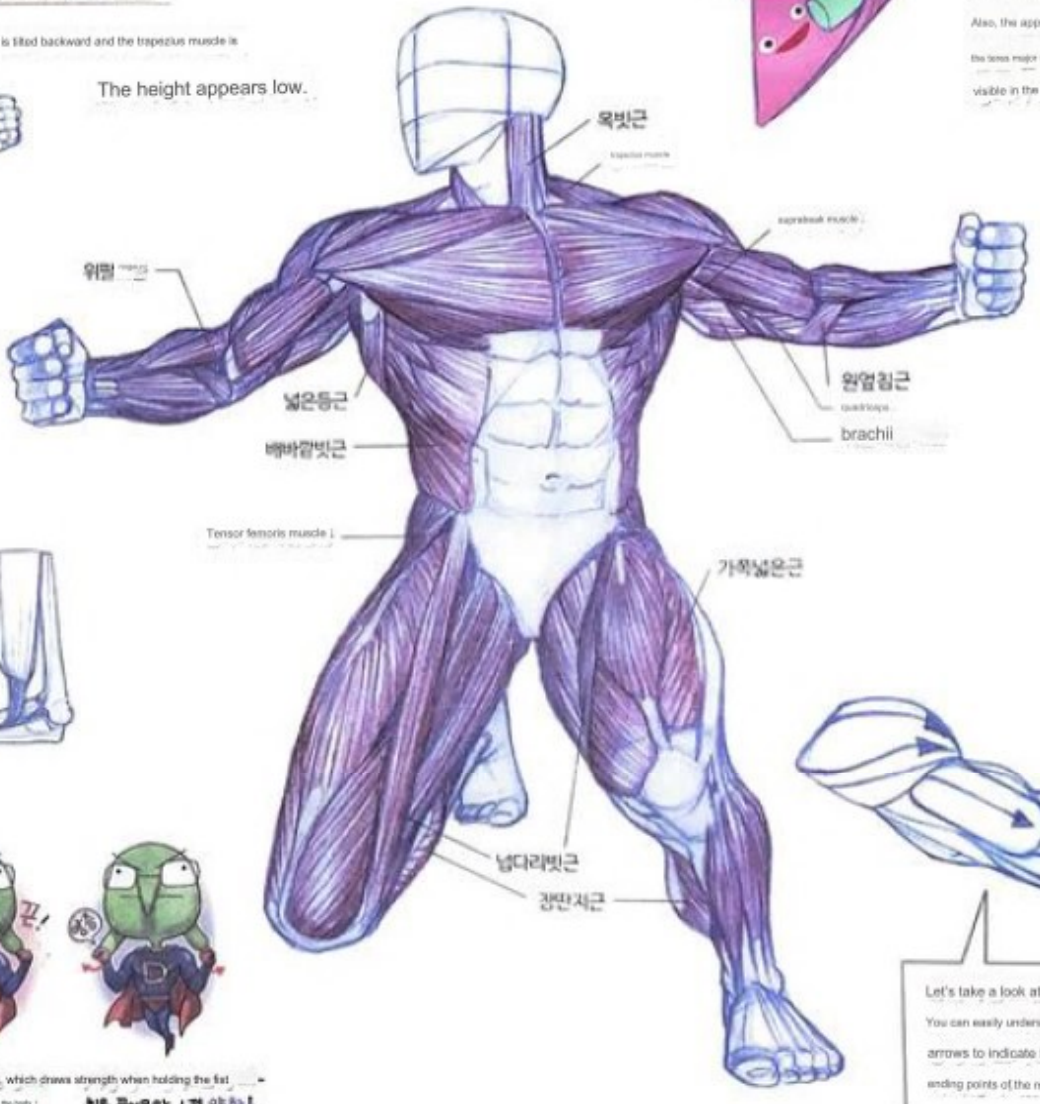
■ Sitting position with arms spread

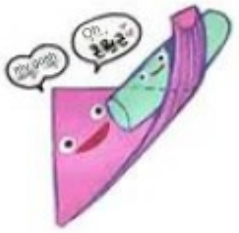


Upper body tilt and trapezius muscles

The upper body is tilted backward and the trapezius muscle is

The height appears low.





The latissimus dorsalis major muscle and the teres major muscle

digging into the armpit • The muscular character's latissimus dorsi

stand out, and if you take a pose where the armpit is clearly visible,

you can see the latissimus latissimus muscle digging into the horse.

Also, the appearance of the latissimus dorsi muscle surrounding

the teres major muscle makes the arm. The structural shape is clearly

visible in the sideways stance.

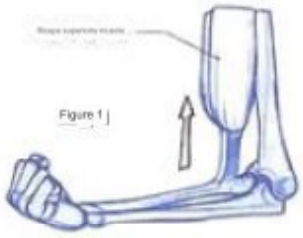


Figure 1

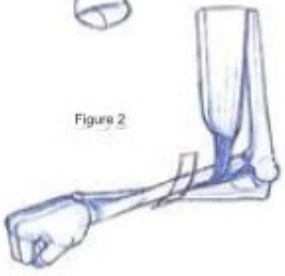


Figure 2

Recognizing hand direction and strength

As shown in the picture, the biceps brachii muscle exerts the strongest force when the fist is bent inward toward the body. As shown in Figure 2, when the fist points down, the force pulling the arm into the body becomes weaker.

-Strengthening Nohaeng, which draws strength when holding the fist ___-

toward the body and outward from the body !

Let's take a look at the structure in a simplified flow.

You can easily understand the curves of the human body by using arrows to indicate the direction of the starting and ending points of the muscles.

Silhouette of bent joints

It is difficult to draw an angle where the silhouette appears straight when the joints of the arms or legs are bent. Even if it is drawn well, an optical illusion can cause the arms to look short. When positioning a bent joint, it is best to draw it at an angle that does not create a straight line.

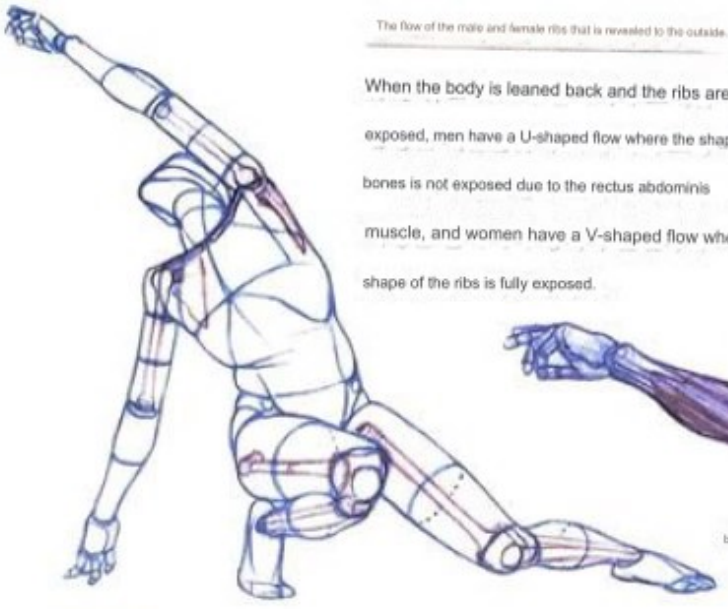
length of body

When the body is leaning back, the rectus abdominis muscle is relaxed, so the thickness should be expressed as thin. Showing the shape of the ribs rather than the shape of the rectus abdominis muscles suits this posture better and creates a good sense of length in the torso.

Changes in the shape of the legs through continuous movement

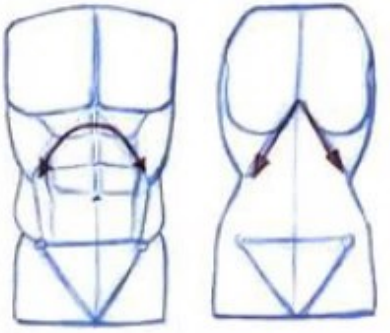
Check the position of the muscles by stretching the folded leg.

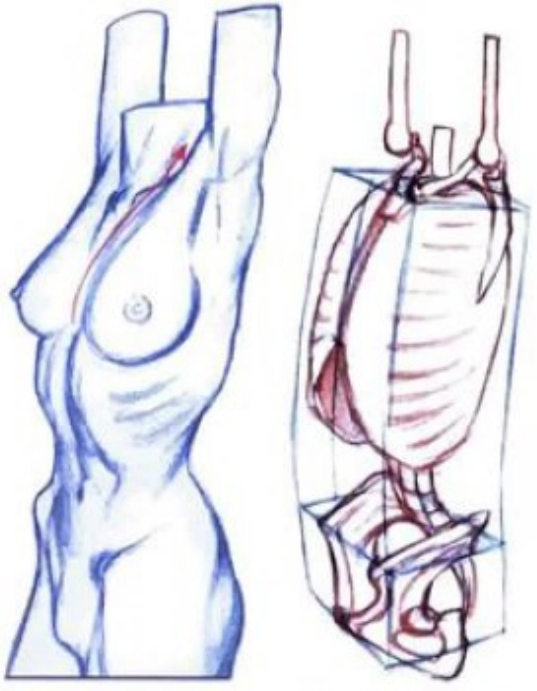
■ Stretching posture with one arm extended upward

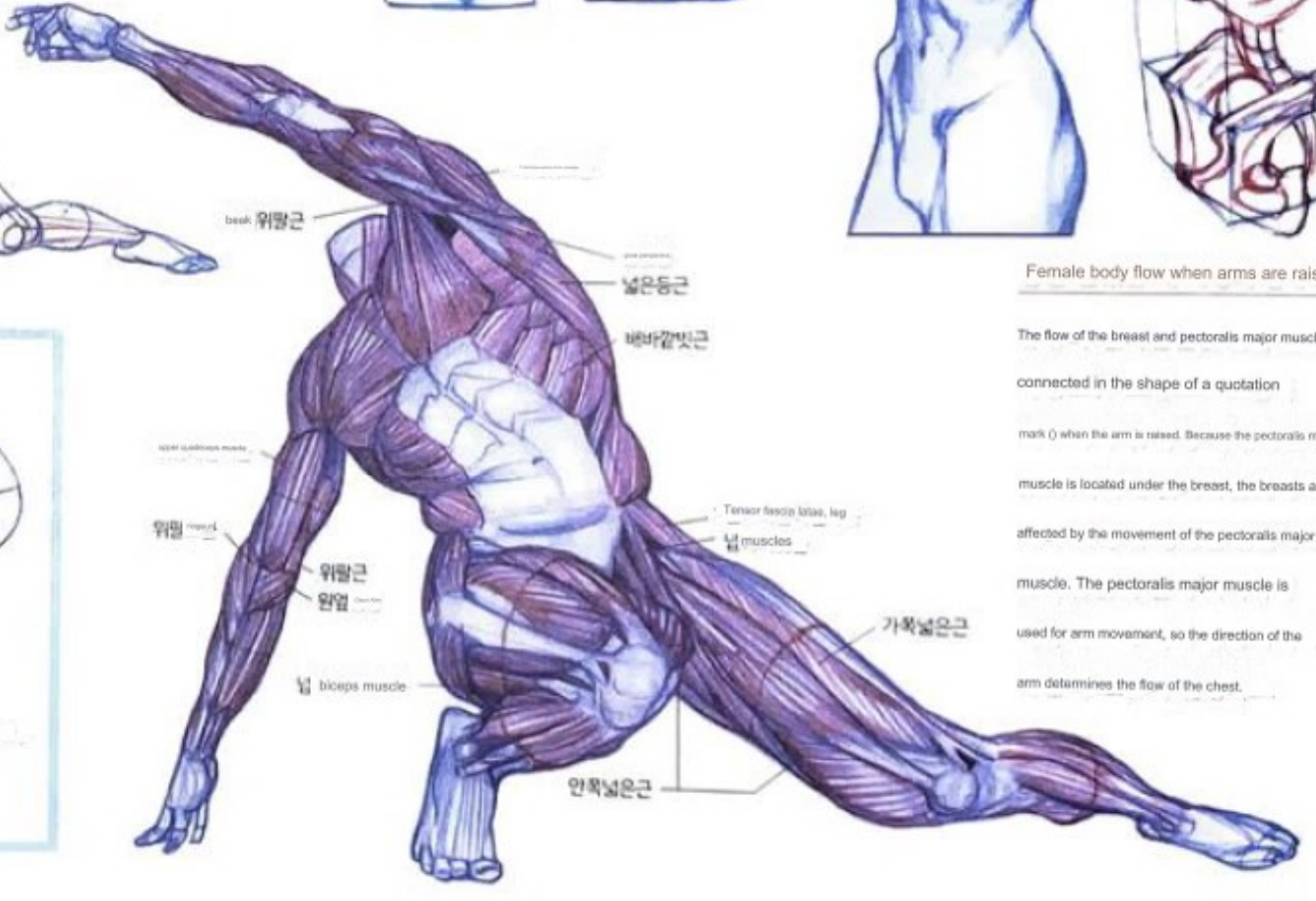


The flow of the male and female ribs that is revealed to the outside.

When the body is leaned back and the ribs are exposed, men have a U-shaped flow where the shape of the bones is not exposed due to the rectus abdominis muscle, and women have a V-shaped flow where the shape of the ribs is fully exposed.



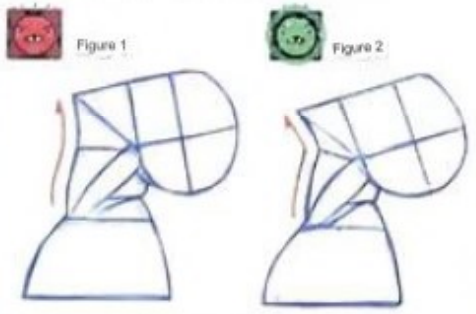




Female body flow when arms are raised

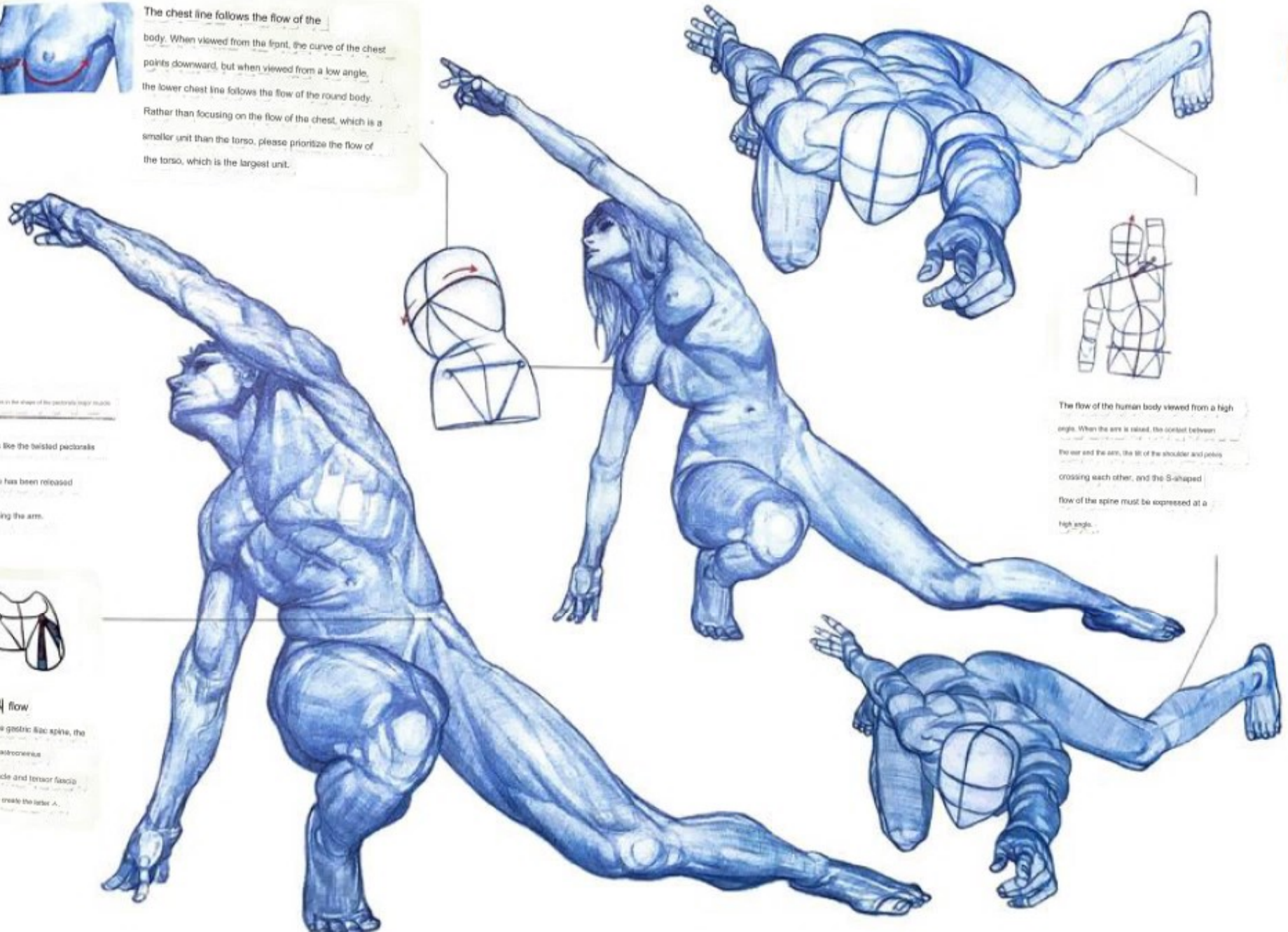
The flow of the breast and pectoralis major muscle is connected in the shape of a quotation mark () when the arm is raised. Because the pectoralis major muscle is located under the breast, the breasts are affected by the movement of the pectoralis major muscle. The pectoralis major muscle is used for arm movement, so the direction of the arm determines the flow of the chest.

오답노트 connection of the jaw



As shown in Figure 1, if you draw the area where the lower jaw connects with the jade in a gentle flow, it will make you look fat or older. In Figure 2, the person has not gained weight as shown in the picture, giving the impression of a healthy young person.

The chest line follows the flow of the body. When viewed from the front, the curve of the chest points downward, but when viewed from a low angle, the lower chest line follows the flow of the round body. Rather than focusing on the flow of the chest, which is a smaller unit than the torso, please prioritize the flow of the torso, which is the largest unit.



Changes in the shape of the pectoralis major muscle

It looks like the twisted pectoralis muscle has been released by raising the arm.

flow

In the gastric iliac spine, the gastrocnemius muscle and tensor fasciae latae create the latter A.

The flow of the human body viewed from a high angle. When the arm is raised, the contact between the ear and the arm, the tilt of the shoulder and pelvis crossing each other, and the S-shaped flow of the spine must be expressed at a high angle.

■ Position with both knees and one hand on the floor

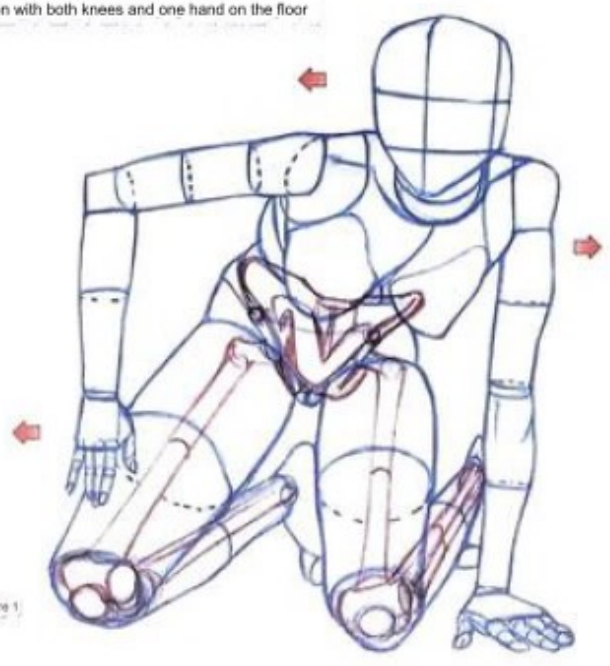
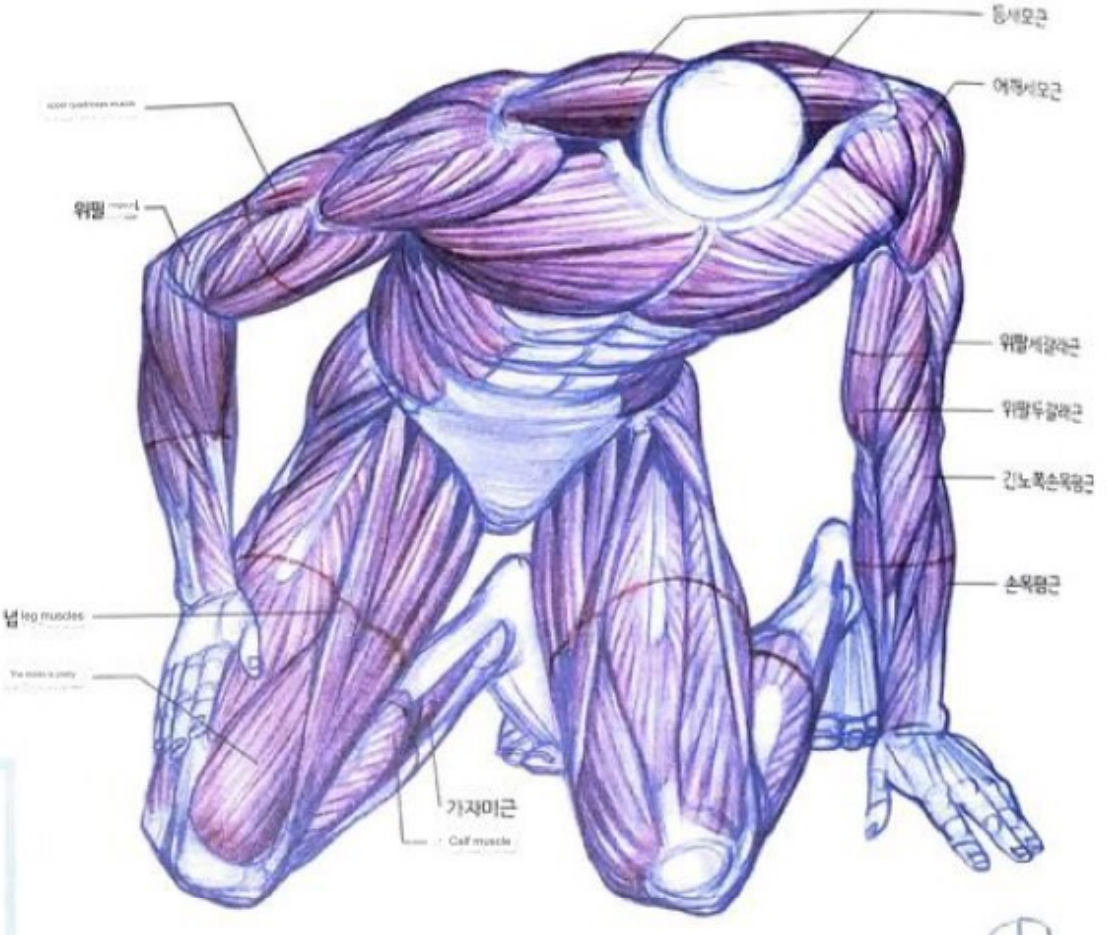


Figure 1

오답노트 monotonous gestures

Figure 2

There is nothing wrong with the posture in Figure 2 in terms of proportion, center of gravity, or volume, but it feels somewhat monotonous as the entire body faces the same side.

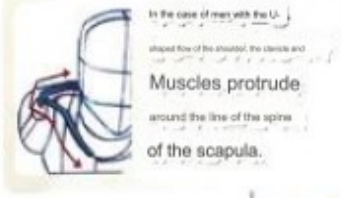


Drawing a younger brother with a sense of rhythm

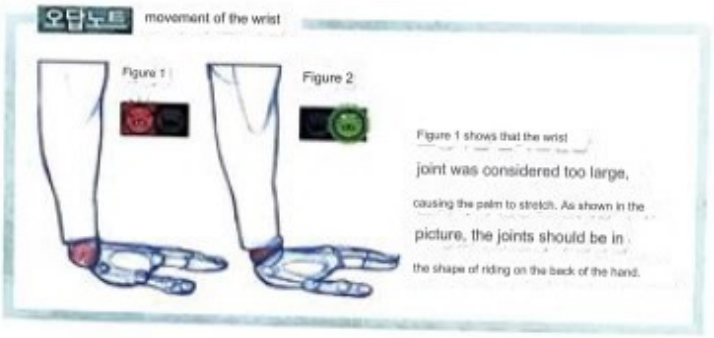
When trying to express rhythmic movement, a method of alternating the tilt of the shoulders and pelvis up and down is generally used. But there are many other methods. In Figure 1, while the tilt of the shoulders and pelvis is the same up and down, the direction of gaze and the left and right directions of the upper and lower body are varied to create a sense of rhythm in the posture.

Stretched arms are not straight

The arm muscles are intertwined like a twist, creating a bumpy flow. However, the extent of this 'bumpiness' is very ambiguous. Improperly emphasizing muscles can result in disasters that make the image appear as if the arm bone is broken. Conversely, if you omit the bending, the arm will be connected as a single cylinder, as if there are no joints. After learning the flow of the human body through croquis, let's practice studying anatomy to find a more accurate flow.



In the case of men with the U-
shaped flow of the shoulder, the clavicle and
Muscles protrude
around the line of the spine
of the scapula.



■ Various sitting positions of women

S-shaped flow of female ribs

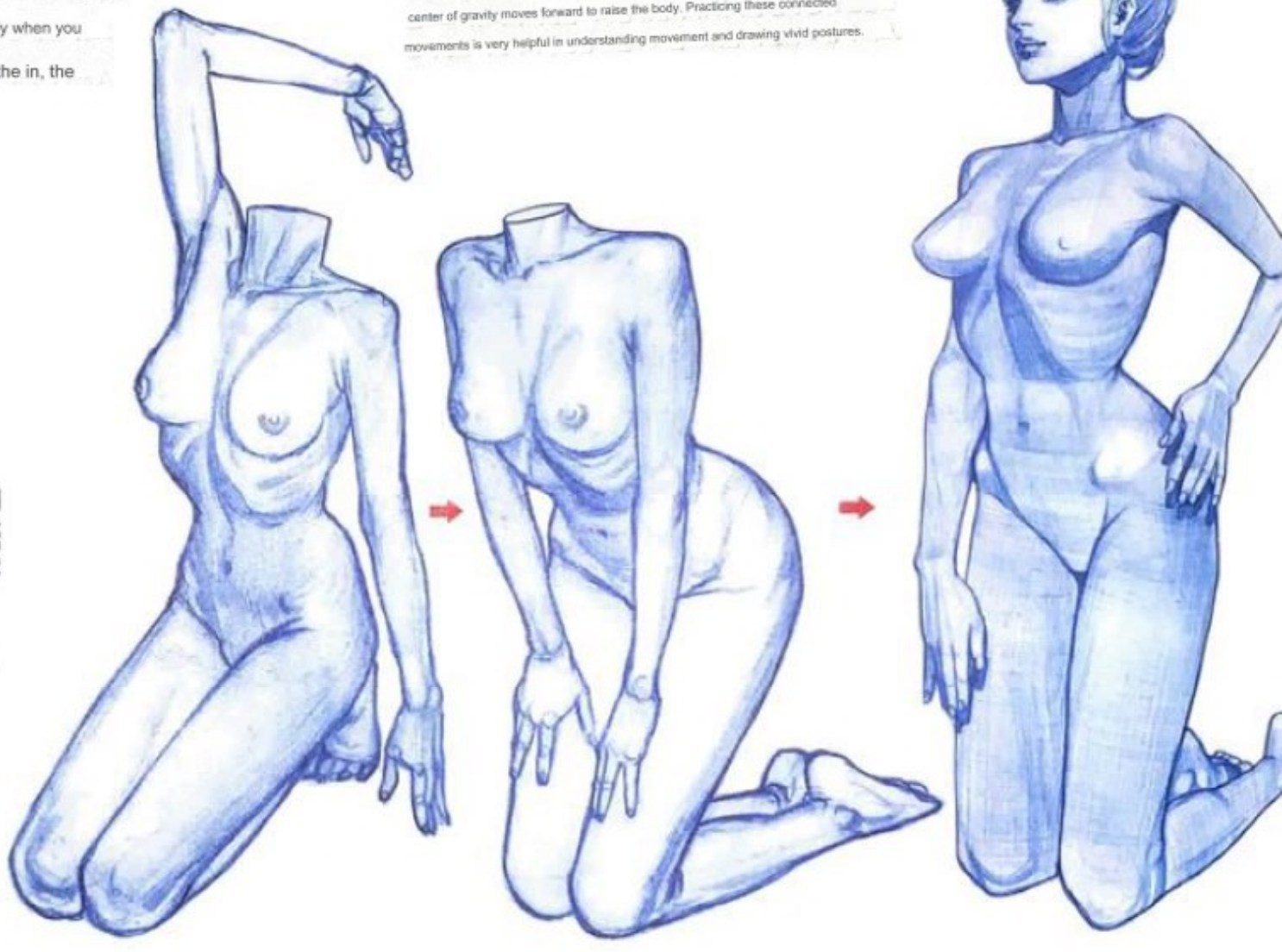
Women have thinner muscles, so the shape of the ribs forms the outline of the body. Especially when you lean your upper body back or breathe in, the flow of your ribs is clearly visible.

stomach cancer hip bone thorn

The superior anterior iliac spine is a representative point that is exposed externally in a woman's pelvis. In women, unlike men, the iliac ridge is buried due to fat accumulated in the pelvis, but the superior anterior iliac spine is prominent. By connecting the superior and anterior iliac spines on both sides, you can determine the tilt of the pelvis.

Studying movement through connected movements* /

The movement of raising the body from a kneeling sitting position is divided into three movements as shown in the picture below. The first and third movements are stationary, but the second movement is in motion and captures the moment when the center of gravity moves forward to raise the body. Practicing these connected movements is very helpful in understanding movement and drawing vivid postures.



female shoulder shape

Women have thinner shoulder muscles

The humerus and beak protrusions create the shape of the shoulder.

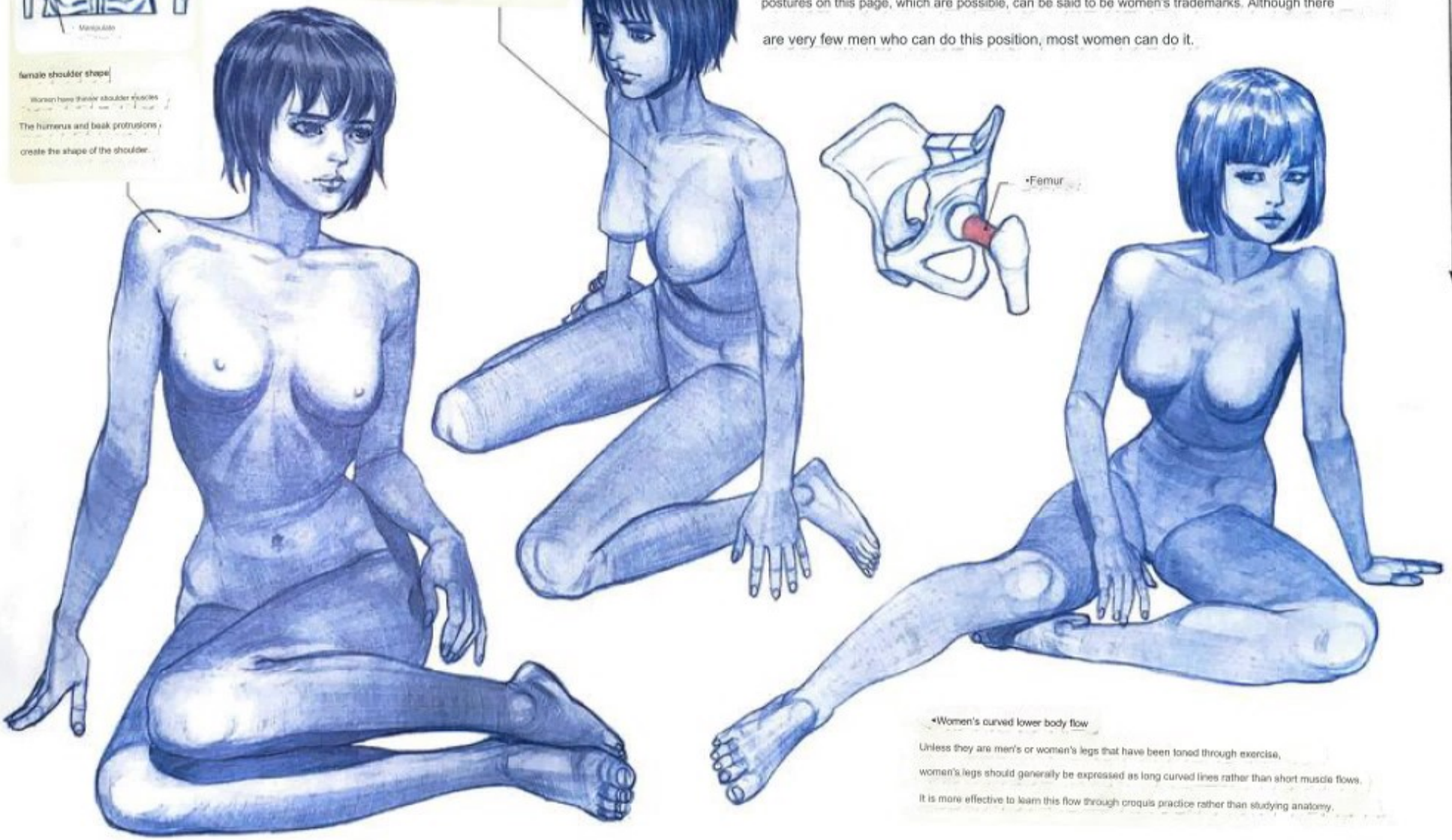
Groove that occurs in the abdominal wall area

Darkness in the front of the chest, which occurs where the sternum and ribs meet, occurs in thin women. appears. Not influenced by the pectoralis major muscle

It is created by the outline of the bone.

A sitting posture unique to women

Women, whose femoral neck angle is more bent than men, have a wider range of thigh bone movement, allowing them to sit in various leg positions. Because of these characteristics, the postures on this page, which are possible, can be said to be women's trademarks. Although there are very few men who can do this position, most women can do it.



•Women's curved lower body flow

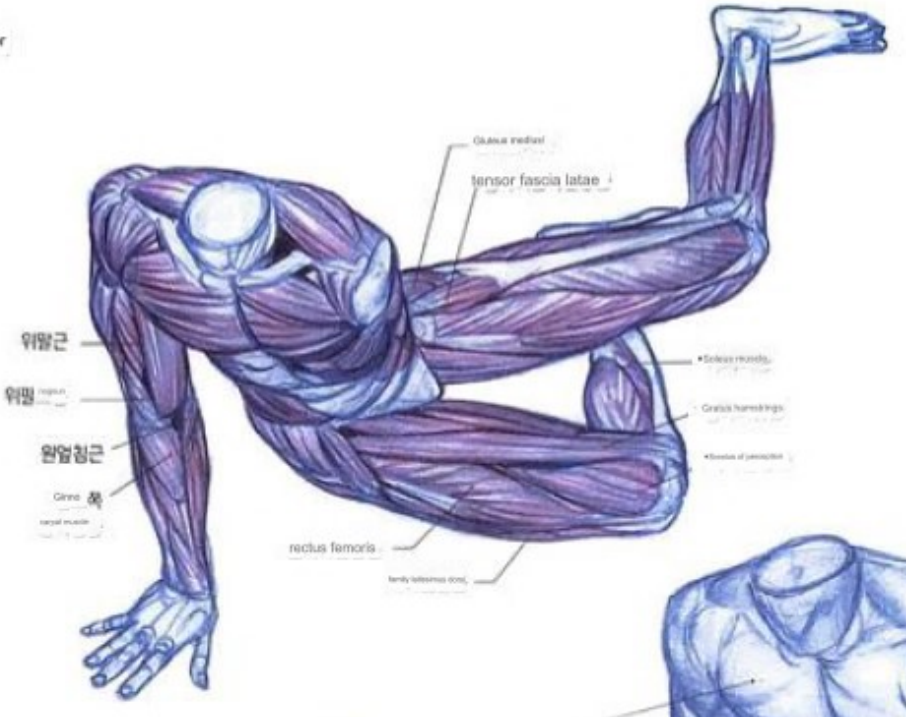
Unless they are men's or women's legs that have been toned through exercise, women's legs should generally be expressed as long curved lines rather than short muscle flows. It is more effective to learn this flow through croquis practice rather than studying anatomy.

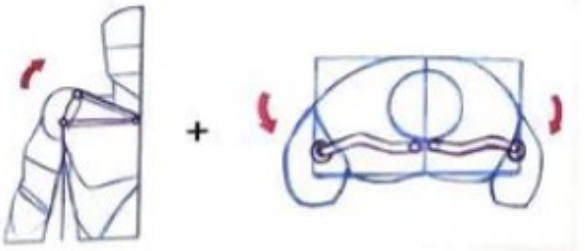
■ Sitting position with both hands on the floor

shapes on the skeleton

Just because it's a shape doesn't mean it's drawn simply. The skeleton inside the body is drawn first and then the shape is applied, so in postures where the shoulder blades affect the silhouette, there is an angular flow caused by the bones, as shown in the circle below.

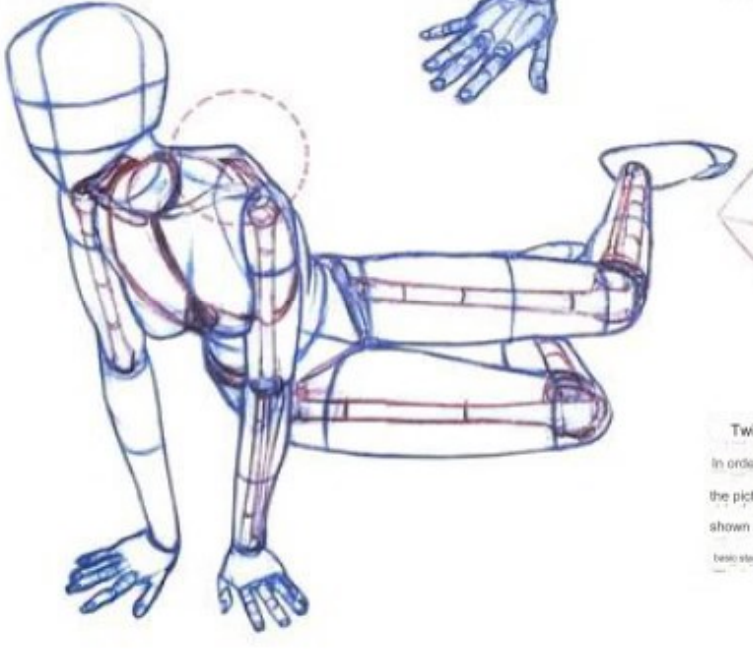
It must be expressed.





shoulder position

In Chapter 1, 'Human Figure Drawing', the movement of the shoulder was explained by dividing it into up and down and front and back to make it easier to understand. The picture below is a posture that combines these two movements.



Twisted body box ▲

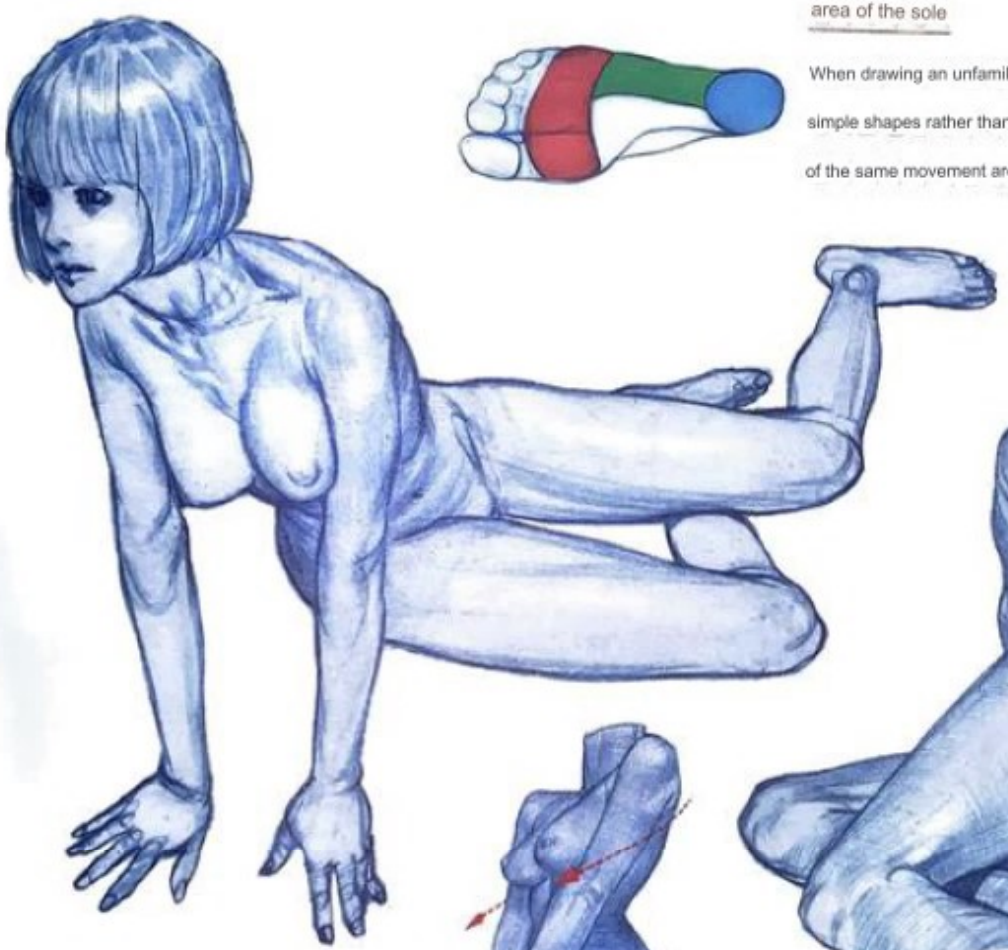
In order to draw the twisted waist shown in the picture on the right, a twisted box as shown above must be drawn from the basic stage.

If you look at the lower body in the picture above, men's muscles are more prominent, so the angular flow of muscles appears even in light and dark.

On the other hand, women have a thick layer of fat on their thighs, which is closer to a cylindrical shape, so the thighs pass smoothly.

area of the sole

When drawing an unfamiliar object, it is important to understand it by dividing the area into simple shapes rather than trying to draw it as is. In the case of the sole on the left, the areas of the same movement are grouped and divided from the area where the foot directly touches the floor.



As shown in the picture on the right, a woman's breasts will be brought together if she places her shoulders in front of her body and points her arms toward the center. If you draw the chest together when it is not in this posture, it will create an unnatural shape.

The flow of the spine The visible furrow in the middle of the back is caused by the spinal processes.

■ Cross-legged sitting posture

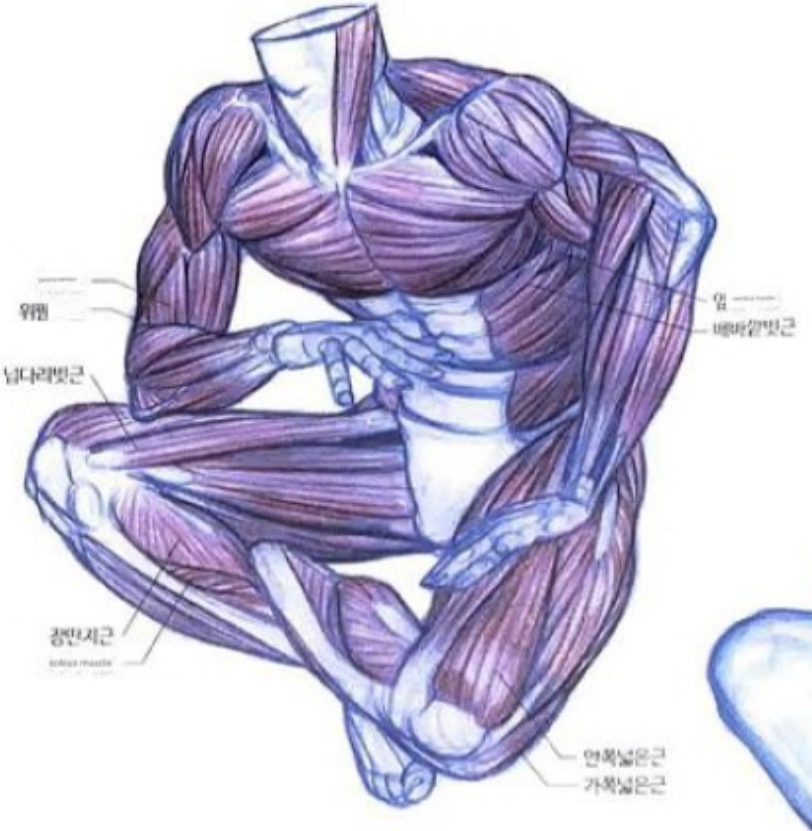


Figure 1

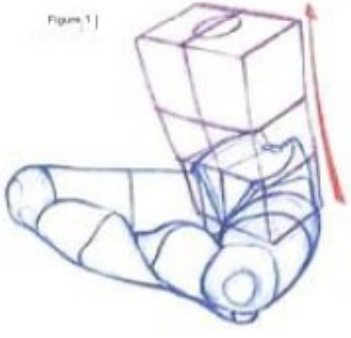
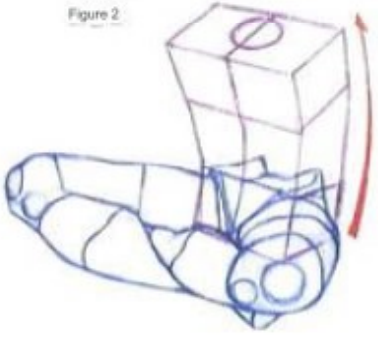


Figure 2



Two postures on cross-legged legs

When sitting cross-legged, the flow of the torso changes as shown in the picture on the left.

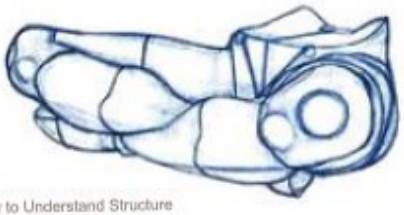
Two postures appear:

Figure 1 shows a tense posture with the back erect and the spinal column contracted. On the contrary, Figure 2 shows a relaxed posture with the spinal column relaxed and the waist bent forward.

The pictures above were drawn in the pose shown in Figure 2.

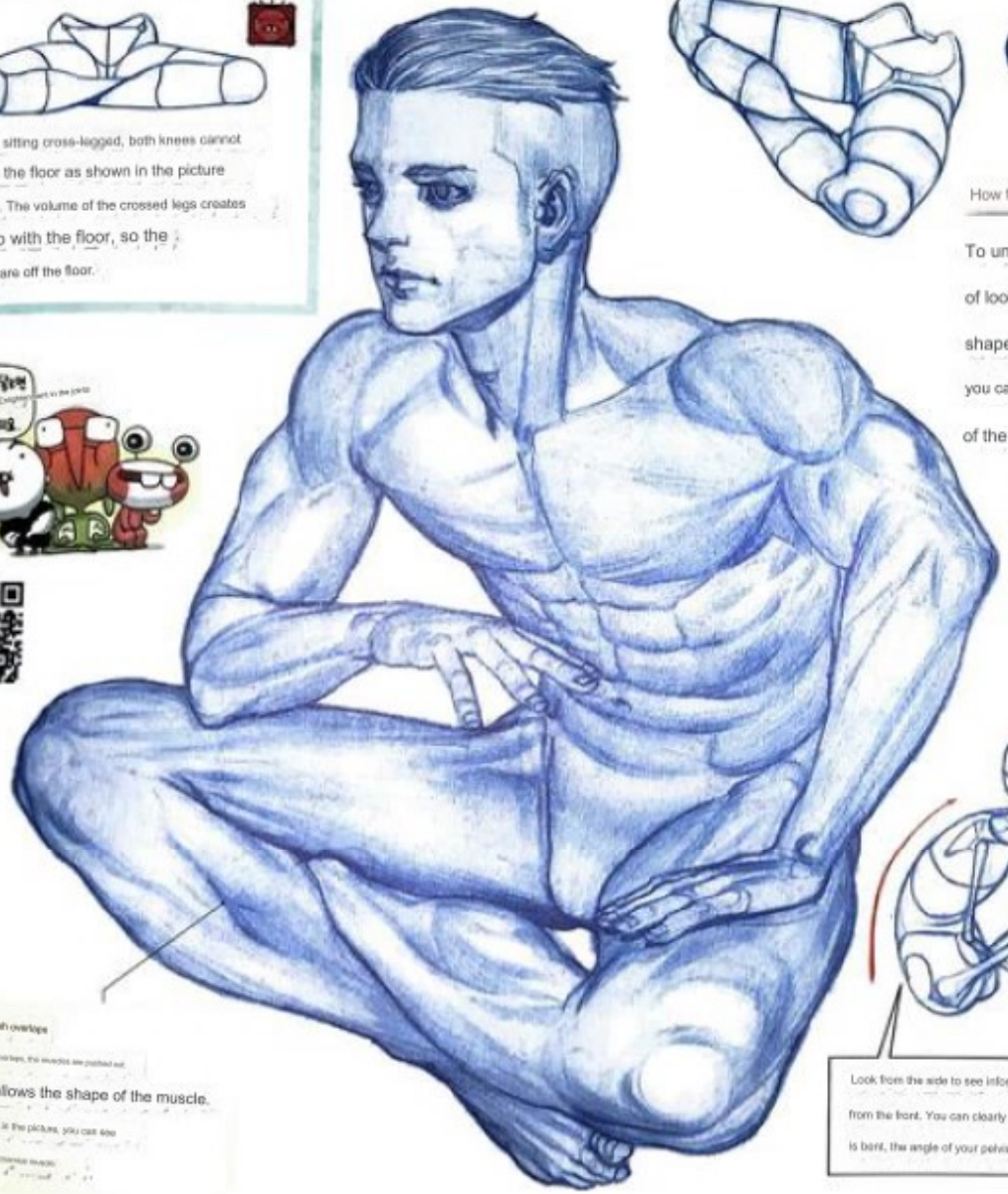
오답노트 Incorrect cross-legged posture

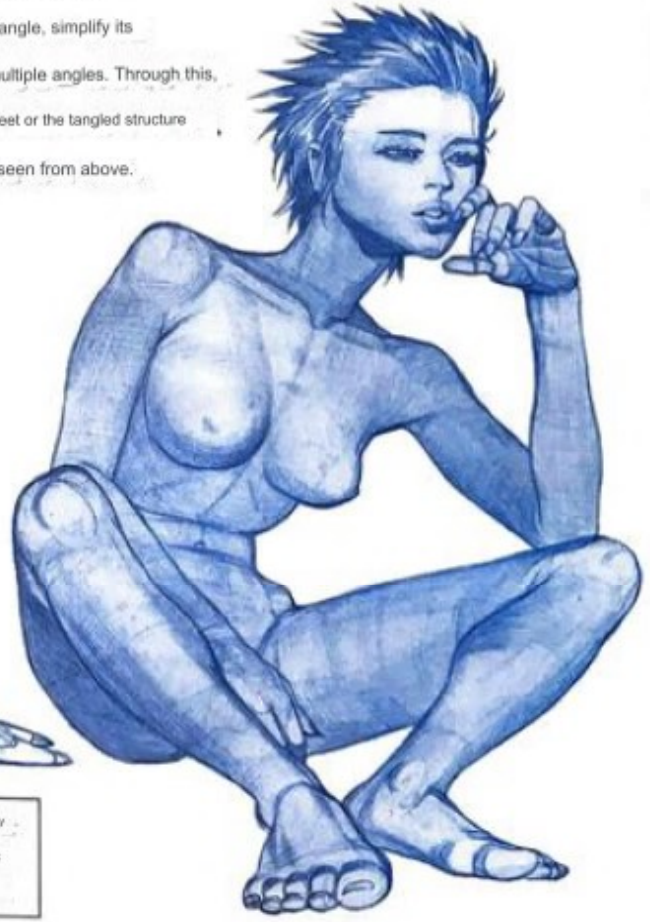
When sitting cross-legged, both knees cannot touch the floor as shown in the picture above. The volume of the crossed legs creates a gap with the floor, so the knees are off the floor.



How to Understand Structure

To understand a difficult structure, instead of looking at it from just one angle, simplify its shape and observe it from multiple angles. Through this, you can see the position of the feet or the tangled structure of the legs that could not be seen from above.





Look from the side to see information that you couldn't see clearly from the front. You can clearly see the degree to which your back is bent, the angle of your pelvis, and the position of your legs.

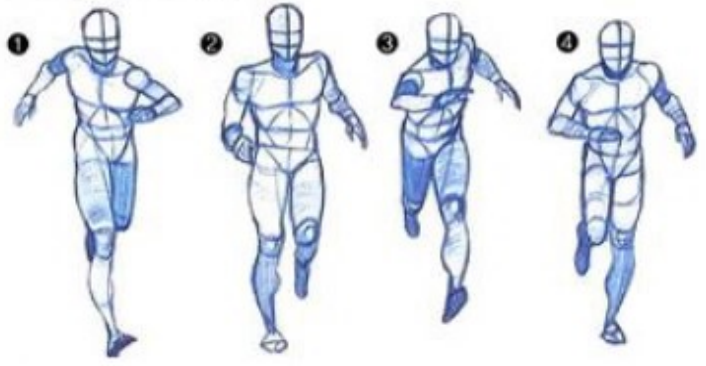
Shape where flesh overlaps

A border follows the shape of the muscle.

In the pose shown in the picture, you can see

3 Running application posture

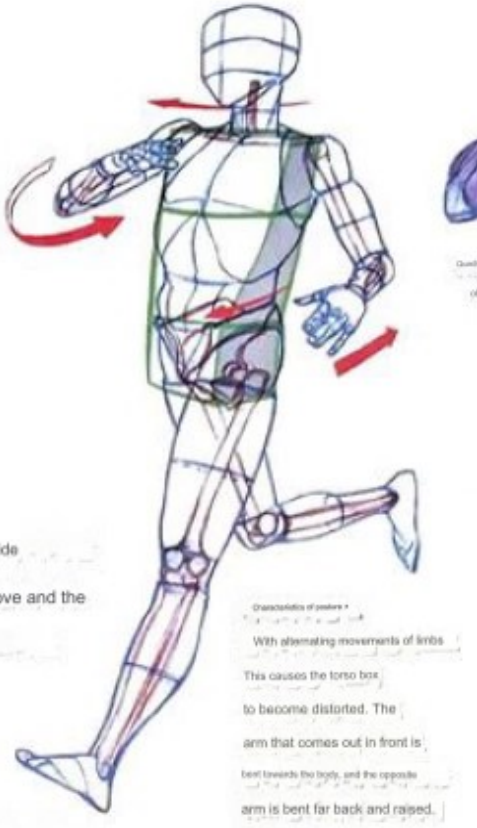
■ Running posture viewed from the side



Drawing continuous running motions

Walking and running movements can often be seen in everyday life. It's such a familiar movement, but if you divide it into several scenes and draw it, it's not as simple as you think. The direction in which the limbs move and the center of gravity are different for each movement, and these points must be accurately known for each posture to express natural movement. If you look at the posture of the picture on the right, you can see that it is the scene most similar to the second picture among the continuous actions above.

When drawing a movement like this, you can express various movements by thinking of it as a body box, so let's break away from typical movements and study the movement at various moments.



Characteristics of posture ▾

With alternating movements of limbs

This causes the torso box to become distorted. The arm that comes out in front is bent towards the body, and the opposite arm is bent far back and raised.

not.

오답노트 Common mistakes in running posture

When students are asked to draw a running motion, they often make the mistake of holding the horse of the character in the picture upright and shaking it back and forth, like an emergency exit sign. It is true that the elbow angle is bent at 90 degrees, but the direction of the horse must be inward from the body. If the tilt of the shoulders and pelvis are both horizontal and looking straight ahead, or if the heels touch the buttocks, it becomes an unnatural movement.

body tilt

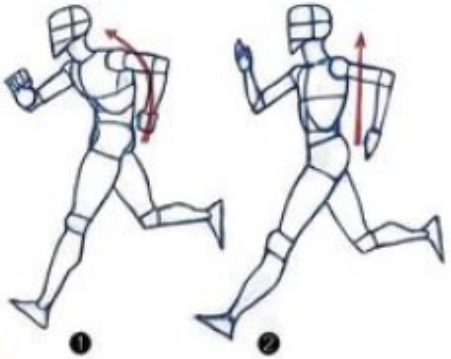
In a running posture, the more your body is tilted perpendicular to the floor, it shows that you are maintaining your running speed or slowing down.

The muscles in the front of the thigh contract to straighten the leg.

Tendon of the biceps femoris

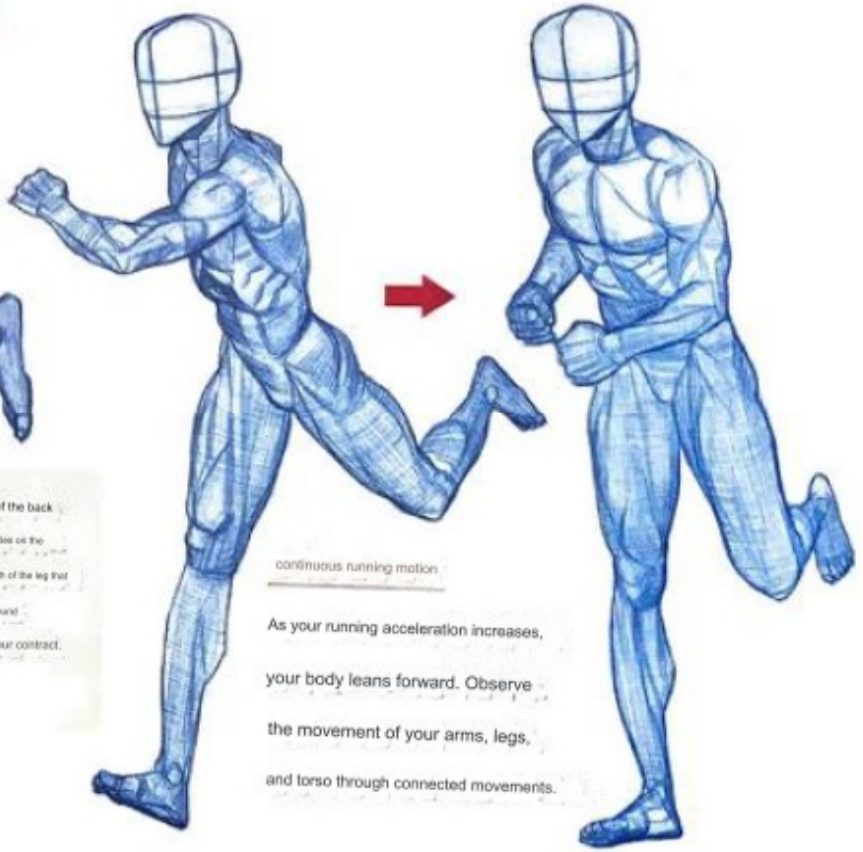
The tendon of the biceps femoris, which is attached to the head of the fibula, stands out.

Contraction of the back thigh The muscles on the back of the thigh of the leg that touches the ground behind the spur contract.



Back tilt in running posture

When you look at your running posture from the side, if your lower back is bent forward like a bow, it cannot be said to be a natural posture. Unless it is right after starting, the tilt of the waist is straight like number 2. The posture immediately after departure will be explained in the next chapter.



continuous running motion

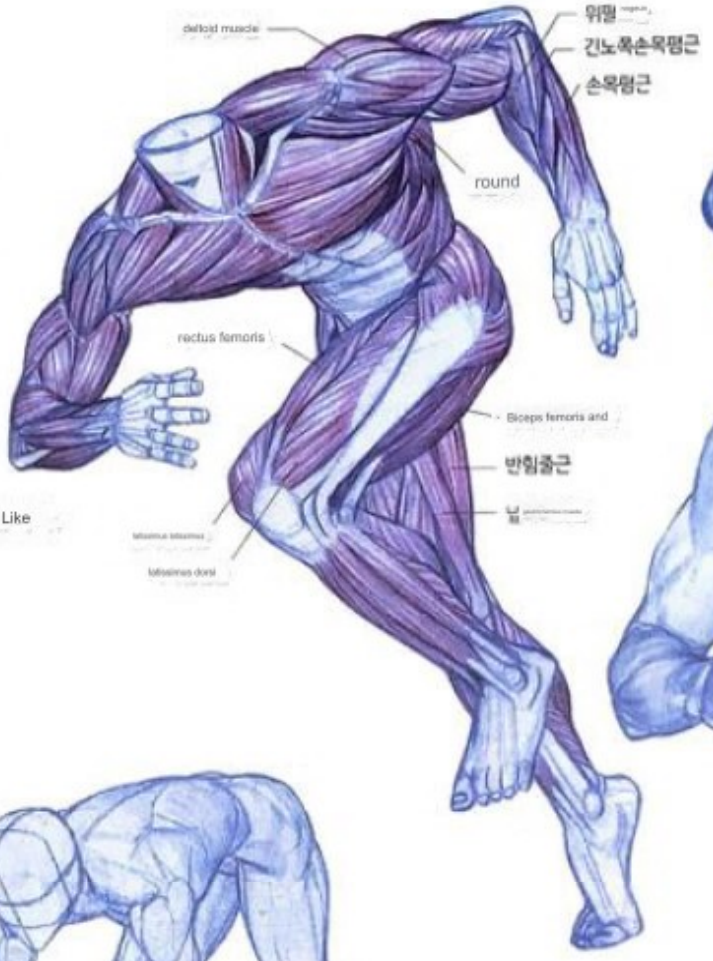
As your running acceleration increases, your body leans forward. Observe the movement of your arms, legs, and torso through connected movements.

■ running starting position

Characteristics of starting posture

As explained earlier, the fact that your back is bent forward in a running posture means that you are in the posture immediately after starting. As shown in Figure 2 below, the preparatory posture for running starts in a low posture with your hands on the floor and your back bent, so immediately after starting, your back gradually straightens and you run forward.

The reason for the low running stance is to compress the body as much as possible like a spring and then spring it back. Like this, running postures are divided into many different types.



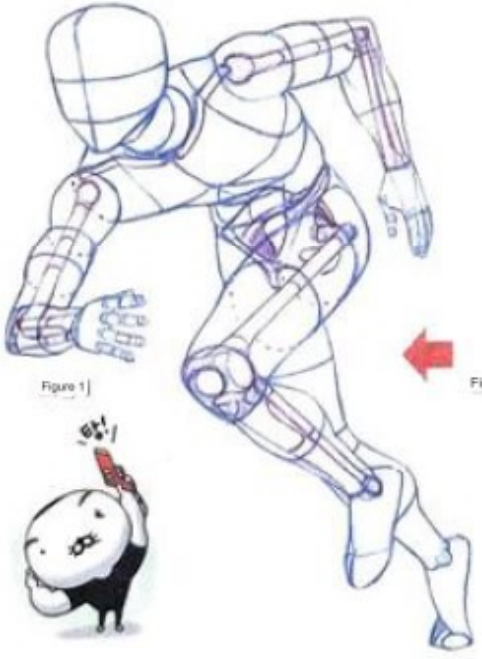


Figure 1

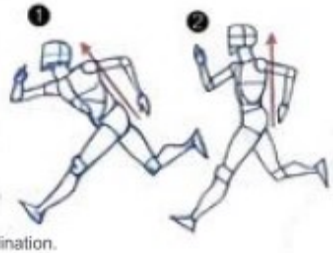
Figure 2

Tension fascia hamstrings

To lift your thighs forward, your tensor fascia latae muscles must contract. The tensor fascia latae is a muscle that connects the thigh and pelvis, so the direction of the wrinkles that appear on the outside and the volume of the muscle are important.

Expressing acceleration

Position 2, where the body is tilted forward, is a position in which the running speed increases, and position 2 is a position in which the running speed is maintained or the speed is reduced. In both postures, the waist is straight and the only difference is the inclination.



View continuous operation from the side

In running, the arms and legs move back and forth, so the characteristics of the movement are more pronounced from the side rather than the front. Since most limb joints move back and forth, observation from the side is important no matter what movement you are drawing.

Triangle chest triangle

The triangular empty space between the deltoid and pectoralis major muscles is clearly visible not only in muscular men but also in thin women.

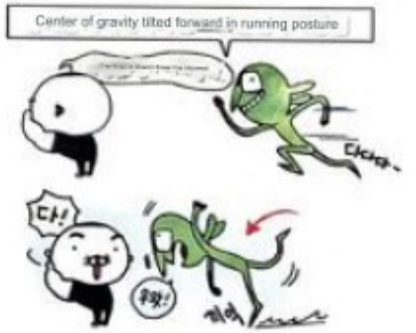
Drawing an inverted posture

In this drawing, you can see that this is the situation right after departure, as the figure on the left is in an inverted posture with the back bent forward. Because the forward arm overlaps the torso, it is more difficult to draw than the pose on the left without overlap.

Why you need to straighten your back

The reason why your lower back must be straight and spread out in all running postures other than the posture immediately after starting is because the force of kicking the ground with your feet is not cushioned by your lower back and must push your body forward.

Center of gravity tilted forward in running posture



■ Running posture seen from behind

Features of running posture

The illustrations on this page show the connection action on the right.

This is a drawing of posture number 1 seen from behind.

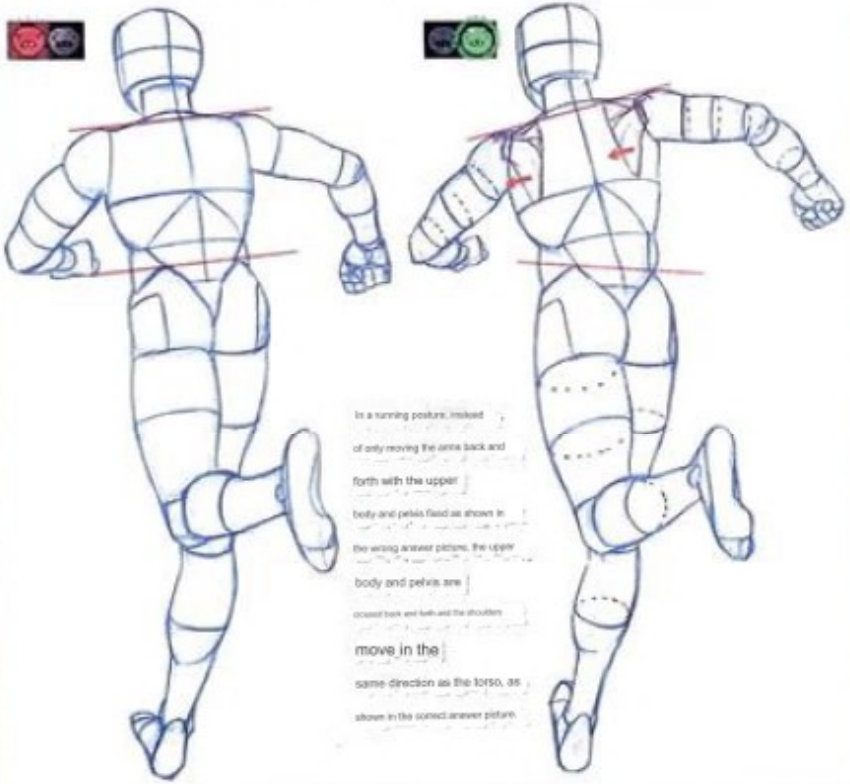
The point of this posture is that both feet are in the air and

then when they land on the floor, the heels

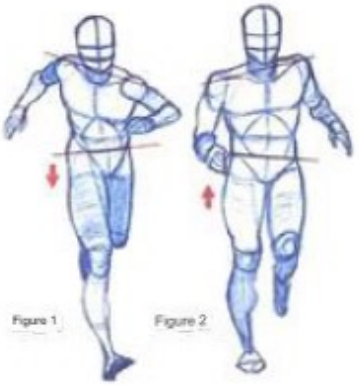
It's the first thing that hits the ground.

Oat

Alternate forward and backward movements of the upper body and pelvis

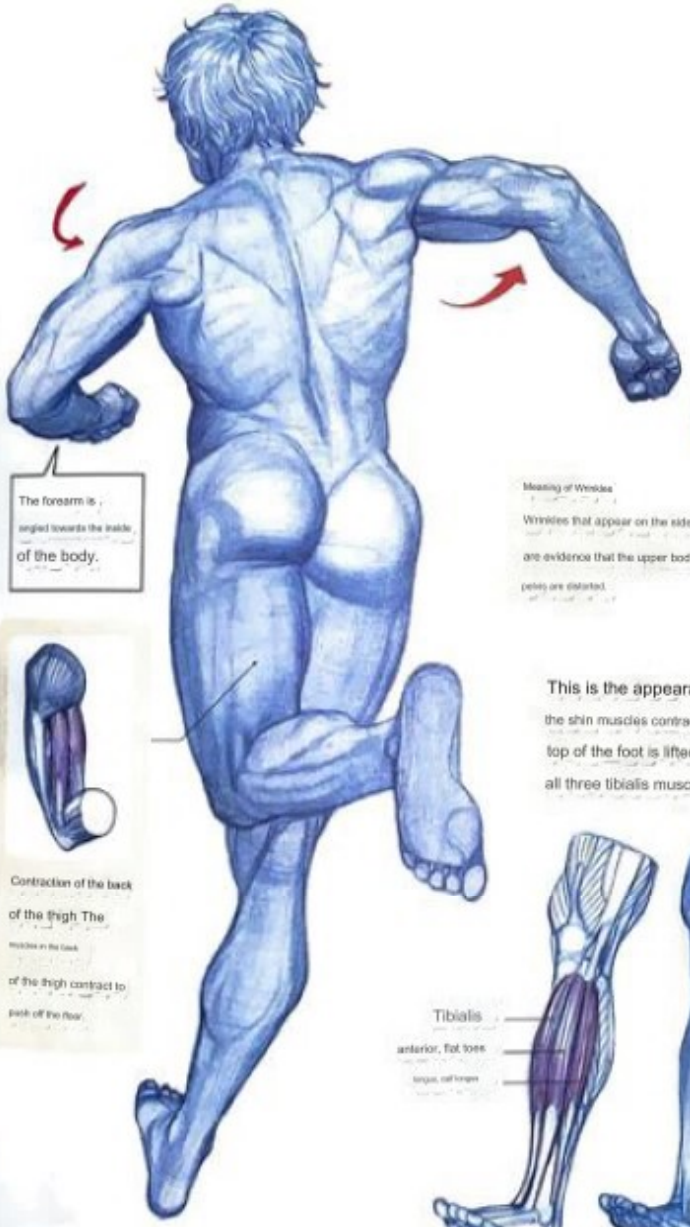


In a running posture, instead of only moving the arms back and forth with the upper body and pelvis fixed as shown in the wrong answer picture, the upper body and pelvis are crossed back and forth and the shoulders move in the same direction as the torso, as shown in the correct answer picture.



movement of the pelvis up and down

If you look at the posture of the picture on this page from the front, it looks like Figure 1. When you walk or run, your shoulders and pelvis move not only back and forth, but also up and down. In Figure 1, the pelvis did not rise because the body weight was not placed on the leg extended forward, but in the next movement, Figure 2, the body weight was placed on the leg that was on the floor and the pelvis rose upward.



The forearm is angled towards the inside of the body.

Contraction of the back of the thigh The muscles in the back of the thigh contract to push off the floor.

Meaning of Wrinkles

Wrinkles that appear on the sides are evidence that the upper body and pelvis are distorted.

This is the appearance of the shin muscles contracted when the top of the foot is lifted. Laterally, all three tibialis muscles are visible.

The trapezius muscle and the deeper rhomboid muscles contract, pulling the shoulder blades toward the spine, causing the shoulders to turn backwards. Women have a thinner muscle layer, so only wrinkles appear on the skin rather than the shape of the muscles, as shown in the picture.

Running back view with exaggerated perspective

As shown in the picture, the phenomenon in which the size of the foot close to the angle is exaggerated and appears large is called 'show-off'. To obtain an image with hypertransparency, you must take a photo close to the camera and the subject, or use a special lens such as a fisheye lens. We will explain in detail later how to draw a hyperperspective drawing.

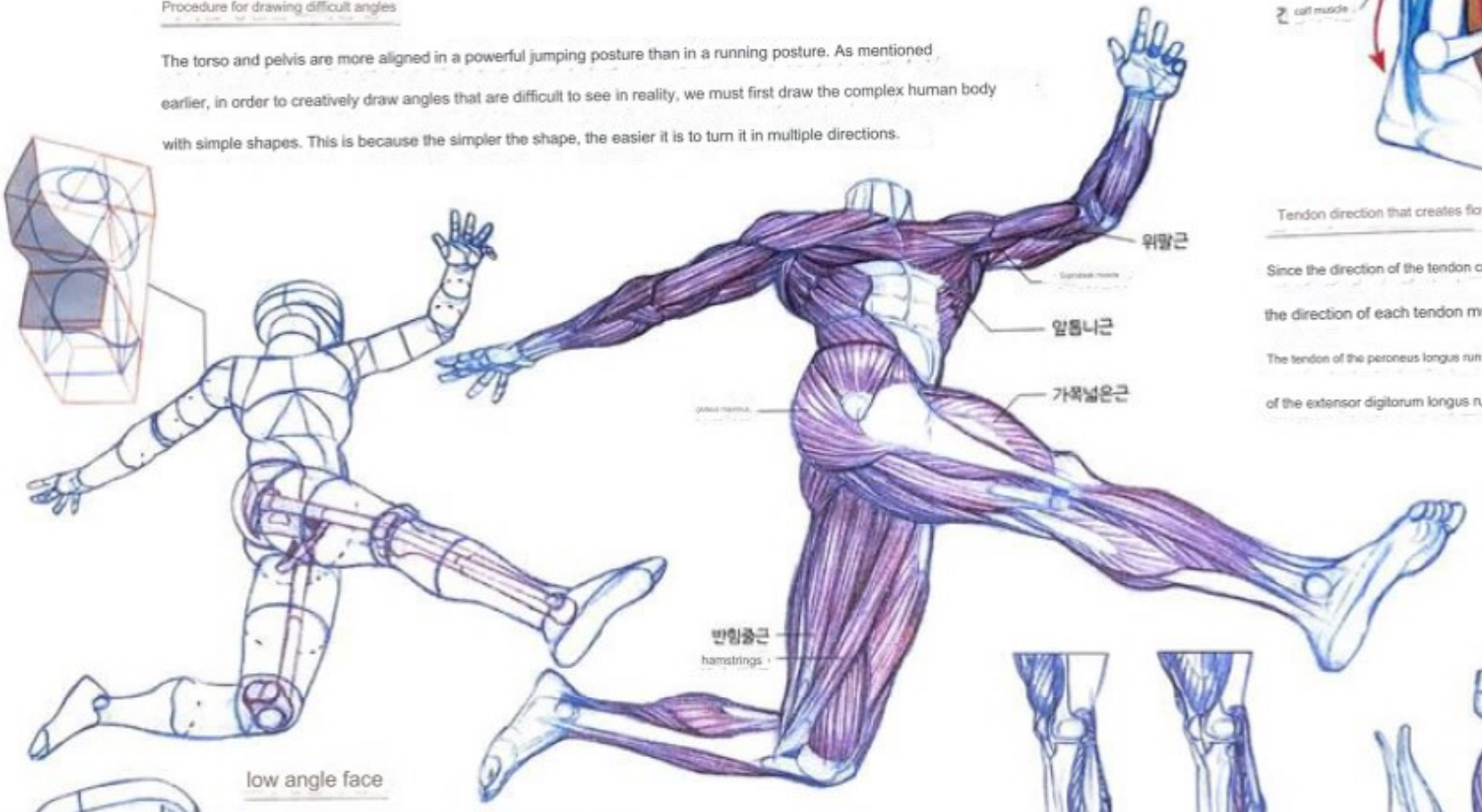
•Tibia muscles seen from the inside

When viewed from the inside, the tibialis anterior creates an outer silhouette, and the tibia is exposed between the tibialis anterior and gastrocnemius muscles. Many people think that the tibia faces forward, but in fact, the tibialis anterior protects the tibia and faces the most forward.

■ long jump posture

Procedure for drawing difficult angles

The torso and pelvis are more aligned in a powerful jumping posture than in a running posture. As mentioned earlier, in order to creatively draw angles that are difficult to see in reality, we must first draw the complex human body with simple shapes. This is because the simpler the shape, the easier it is to turn it in multiple directions.



Tendon direction that creates flow in the ankle

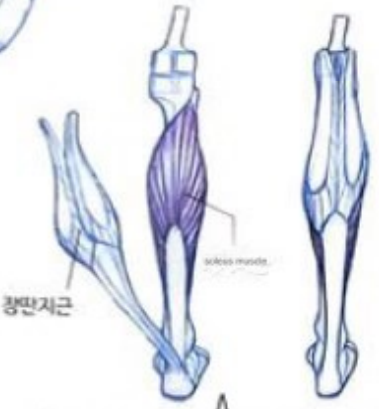
Since the direction of the tendon creates the flow of the ankle, the direction of each tendon must be paid attention to.

The tendon of the peroneus longus runs behind the malleolus, the tendon of the extensor digitorum longus runs across the middle of the top of the foot, and the tendon of the tibialis anterior enters the medial side of the foot toward the big toe.

low angle face

The structure of the face with the lower chin visible is not something we are familiar with because it is an angle we do not commonly see in our daily lives. The actual face is not divided into sides like this, but for study purposes, let's observe the structure by dividing it into regions.

View of the soleus muscle from the medial and lateral sides



Appearance of the soleus muscle located in the deep layer of the gastrocnemius muscle

Understand the precise

flow and intertwined

structure of muscles

simplified with lines!

Principle of

exercise The arm moves back and

forth in an arc. The legs spur

the floor with a centrifugal

force that opposes the arms,

causing the body to bounce forward.

As the pectoralis

major muscle is lifted, a

hollow space like a

pocket is created.

Thighs viewed from the inside

Depending on the viewing angle,

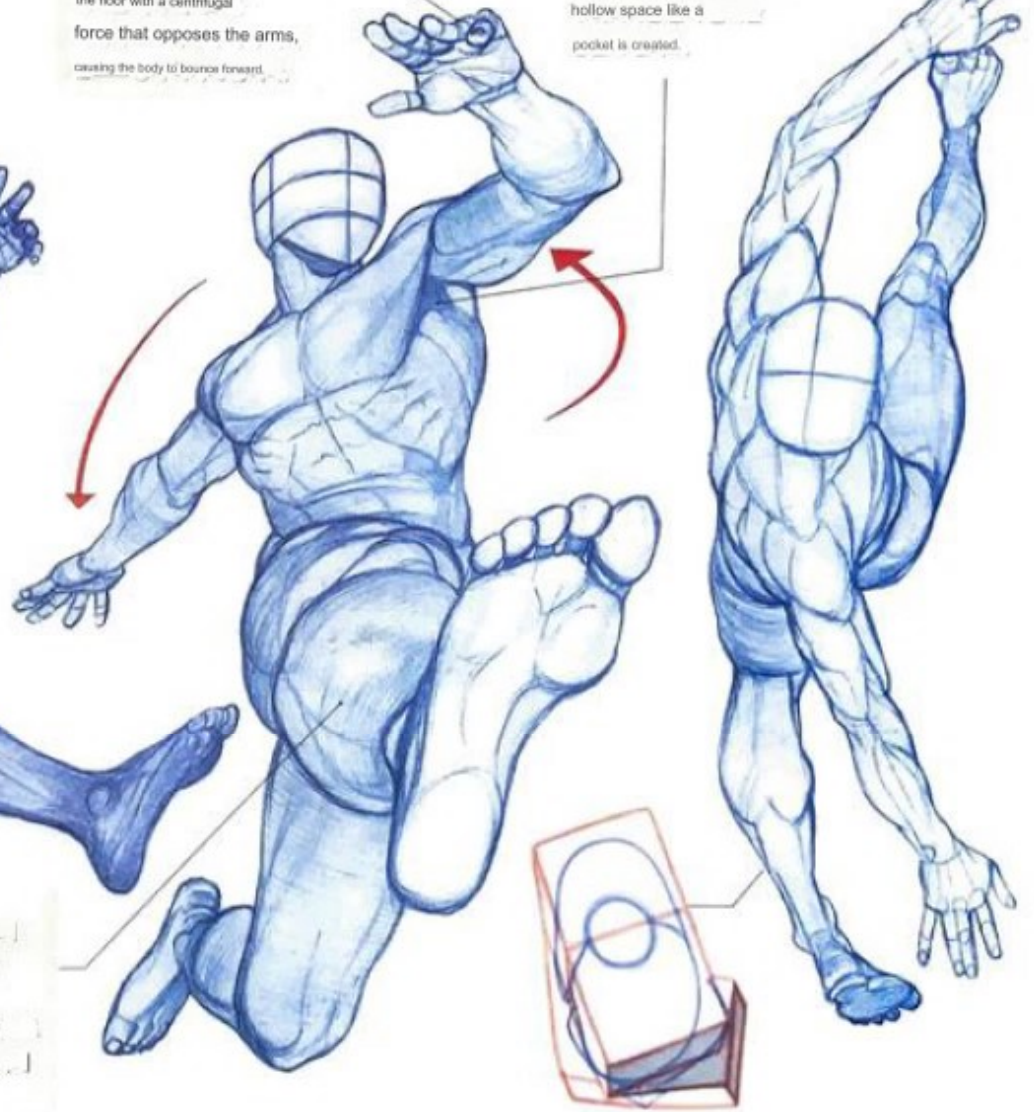
the area where the muscles are

tied also changes. When you look at

the inner thigh from this angle, it

appears divided into three areas as

shown in the picture on the right.



No matter how many times I emphasize it,

it is not enough. In order to accurately draw the

difference in size of complex overlapping

bridges, you need to calculate simple shapes

first so you can focus on information about size. As

I repeat, the more complex the structure, the more

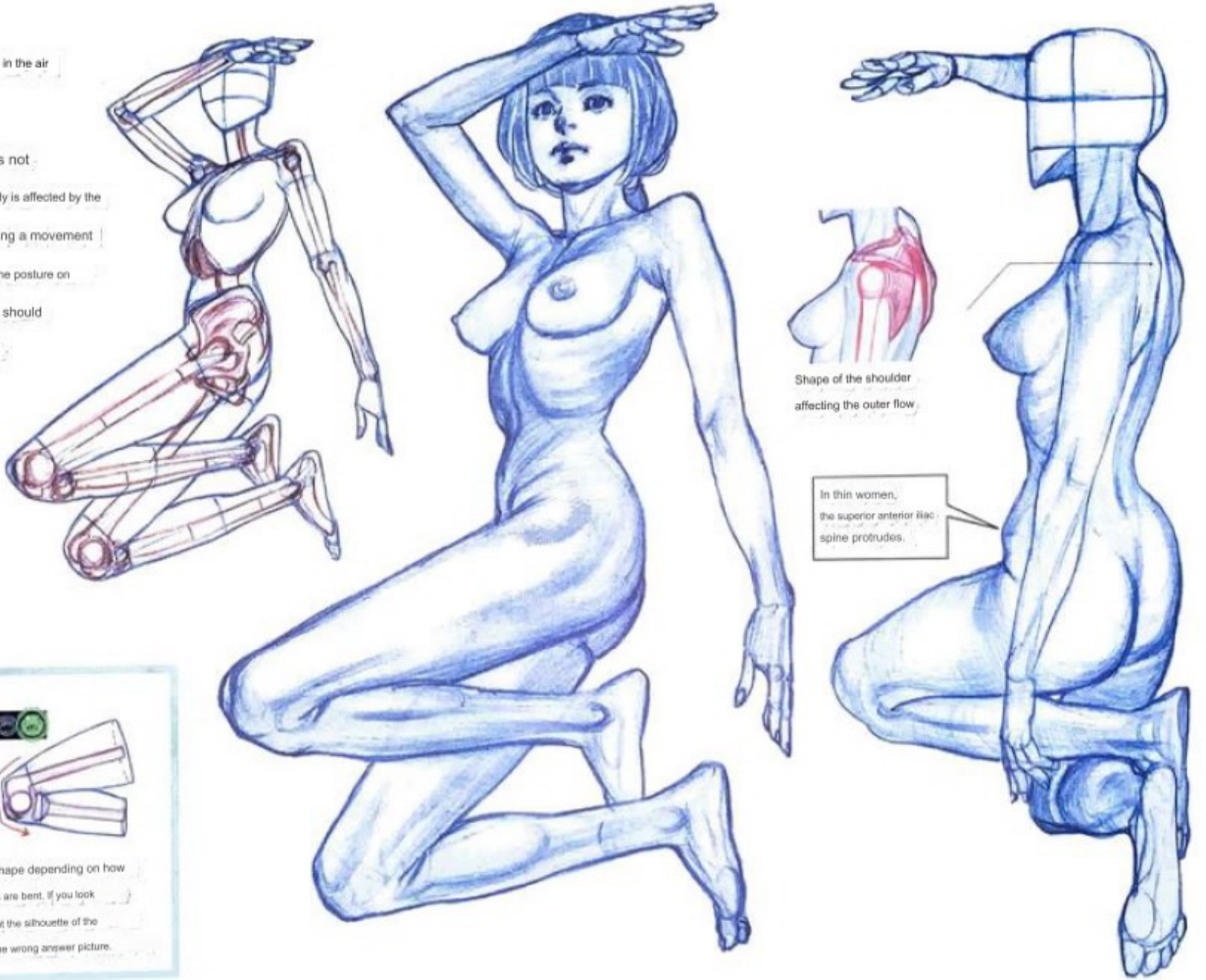
important it is to look at it simply.

4 aerial application posture

- Posture of looking into the distance in the air

center of gravity in the air

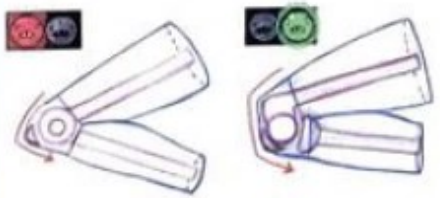
In the air, the center of gravity is not affected, and the flow of the human body is affected by the direction of movement. When making a movement to look somewhere in the air, such as the posture on this page, the direction of the body should follow the direction of the gaze rather than just turning the head to create a natural movement.



Shape of the shoulder affecting the outer flow

In thin women, the superior anterior iliac spine protrudes.

boat skeleton of the knee



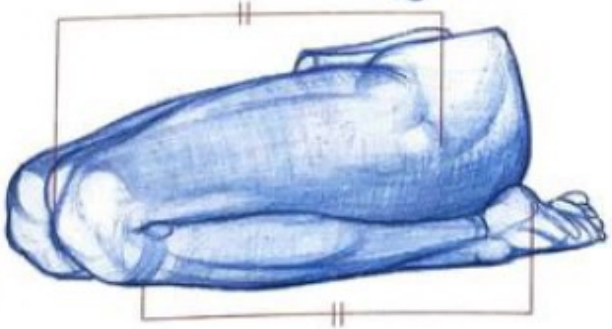
There are many differences in the shape depending on how you think of the skeleton when the knees are bent. If you look at the figure on the right, you can see that the silhouette of the bent knee is square, not pointed like in the wrong answer picture.

Appearance of the teres major muscle exposed by raising the arm

movement of the knee joint

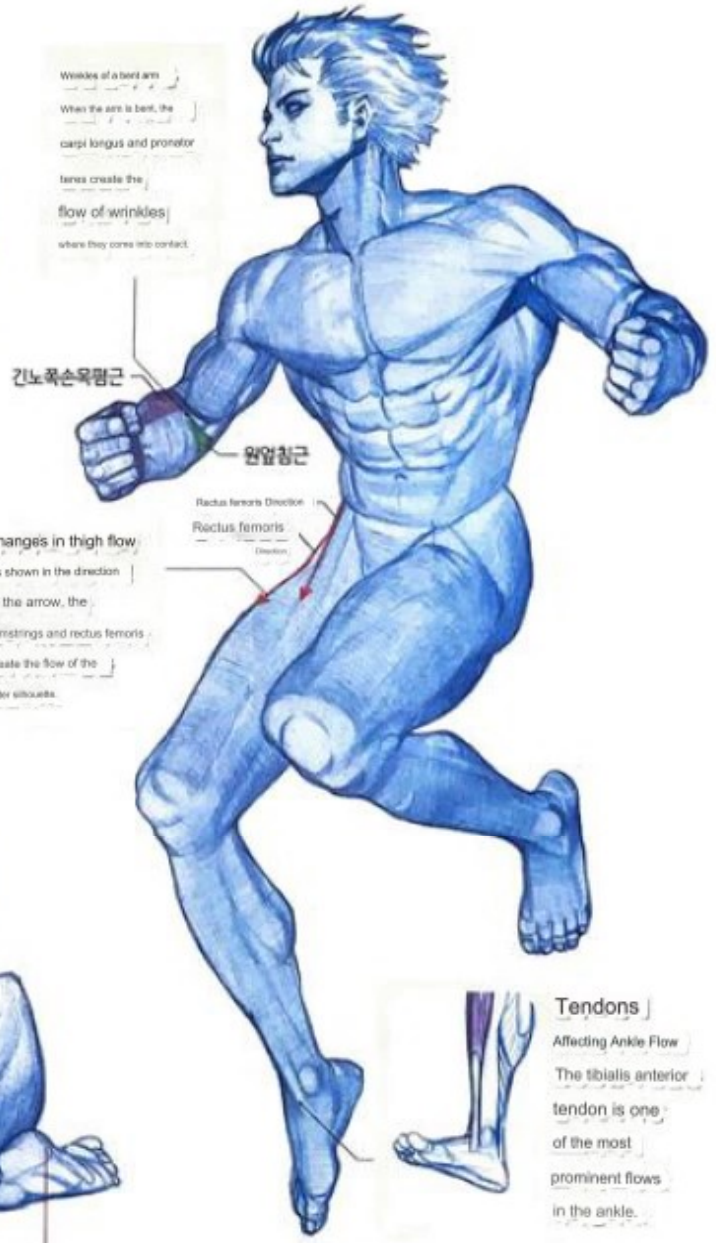
If you bend your knees using only the strength of your legs, like in the above pose, your heels will not touch your buttocks. As shown in the picture on the right, you must sit with your weight on so that your heels and buttocks touch each other. •The length of the femur is 1:1 from the tibia to the heel.

View of the covered right arm



Wrinkles of a bent arm

When the arm is bent, the carpi longus and pronator teres create the flow of wrinkles where they come into contact.



changes in thigh flow

As shown in the direction of the arrow, the hamstrings and rectus femoris create the flow of the outer silhouette.

Tendons

Affecting Ankle Flow

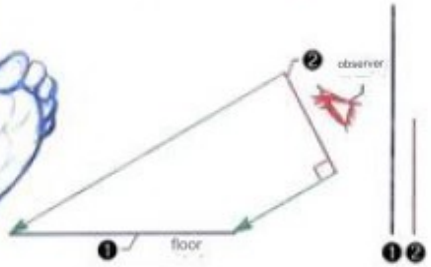
The tibialis anterior tendon is one of the most prominent flows in the ankle.

Shortening phenomenon that occurs at low angles

Figure 1.2 is a picture viewed from the same angle. Figure 1 clearly gives the impression of looking up from below, while Figure 2 has the body tilted forward, reducing foreshortening. Even small movements of the character can make a big difference in the feel of the angle. Therefore, when drawing a person at various angles, you can draw a more accurate picture by drawing a line to indicate the slope of the angle from the side as shown in the box and check what angle the person's posture is compared to the slope of the angle.

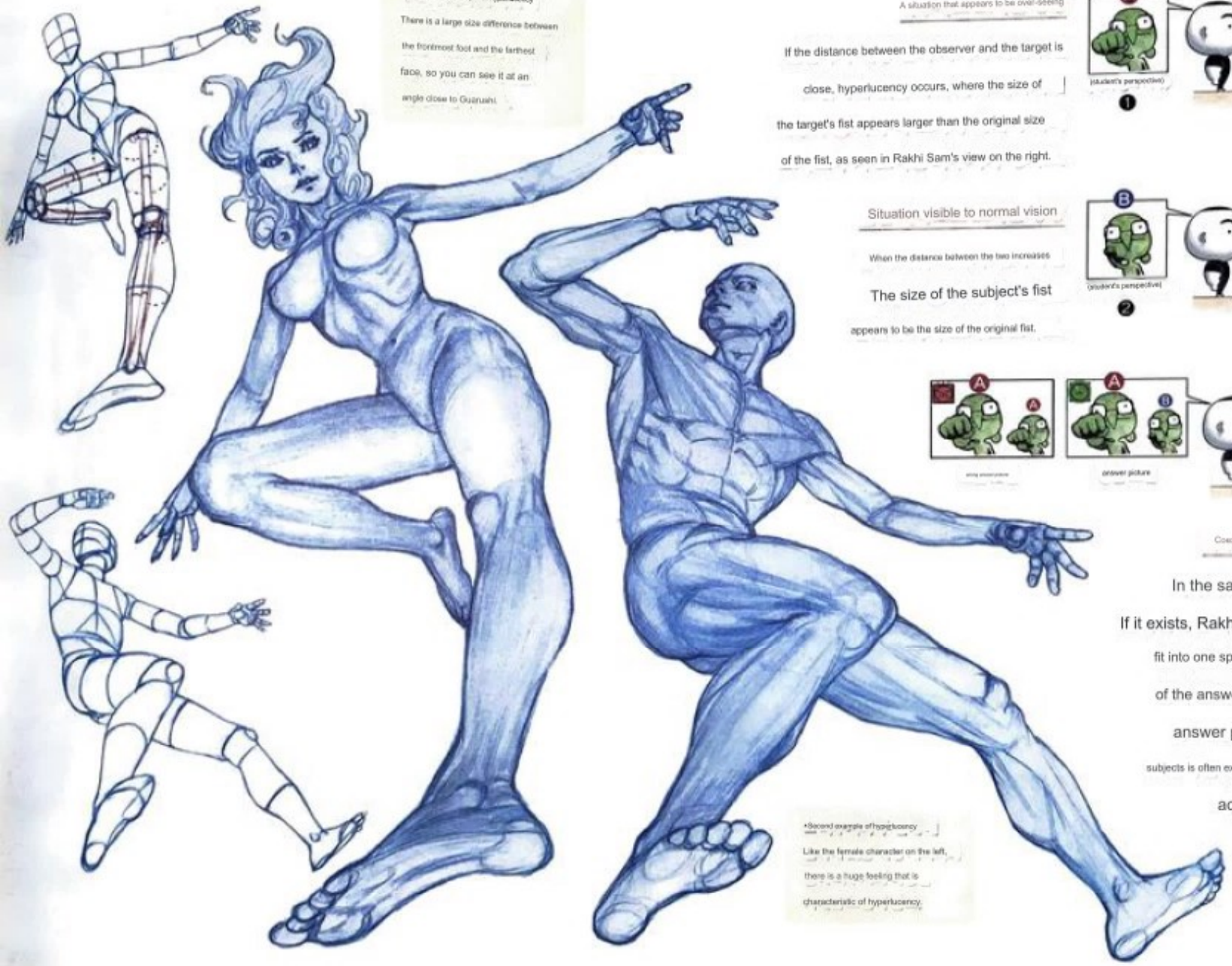
Figure 1

Figure 2



How shortening occurs

When looking down at the floor diagonally as shown in the picture on the left, the area of the floor is shortened from the observer's perspective and appears shorter than its original length. This is because the floor is viewed diagonally rather than vertically. The same principle applies to low angles and high angles as when viewed from an angle, resulting in the appearance of the length being shorter than its original length.



The first example of hyperlucency

There is a large size difference between the frontmost foot and the farthest face, so you can see it at an angle close to Guanushi.

A situation that appears to be over-seeing

If the distance between the observer and the target is close, hyperlucency occurs, where the size of the target's fist appears larger than the original size of the fist, as seen in Rakhi Sam's view on the right.

❶

Situation visible to normal vision

When the distance between the two increases

The size of the subject's fist appears to be the size of the original fist.

❷

Coexistence of hyperlucency and normal vision

In the same space as the subject

If it exists, Rakhi Sam's vision and 2 will fit into one space and look like the picture of the answer. As shown in the wrong answer picture, the ratio of both subjects is often expressed as , so use hyperlucency according to the situation!

•Second example of hyperlucency

Like the female character on the left, there is a huge feeling that is characteristic of hyperlucency.

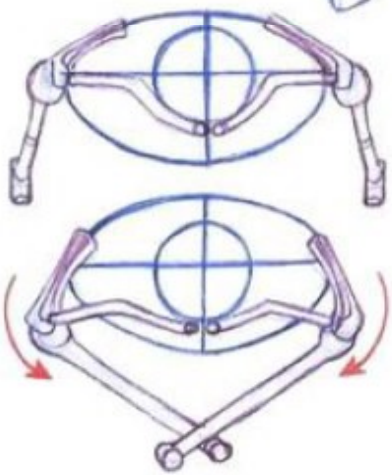
■ crouched mid-air posture

오답노트 shoulder joint

If you think of the shoulder joint as a fixed position like a wooden doll, the angle of the arms will not bend inward when you try to fold them.

Crouching position with arms folded inward as much as possible

This is a posture that allows you to think about what the limit of the angle is and how much your skin is being pressed when you pull your arms hard and cross them.



Chanit posture

This is the position of the clavicle and shoulder blade when standing at attention.

posture with arms folded in front

In order to bring your arms forward as much as possible, your shoulder blades should also come forward as much as possible.

When women with a thick layer of fat around the pelvis fold their legs, the fat is pushed to the side compared to men.

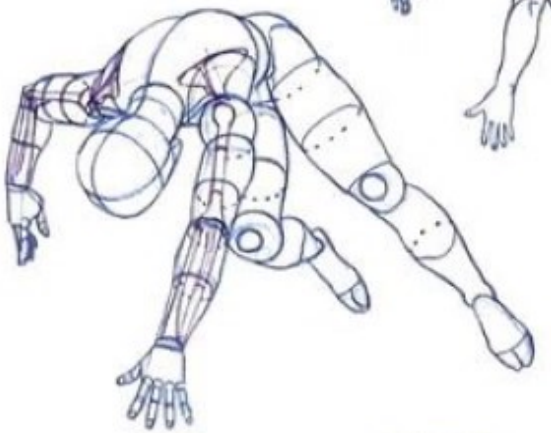
This is the ascellation triangle area that we learned in Chapter 3.

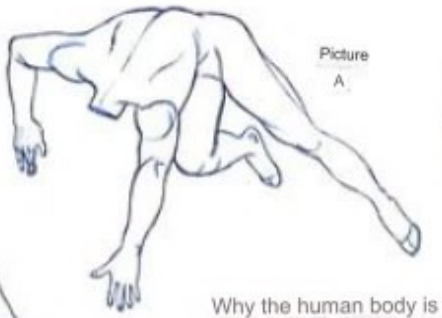
Angled silhouette created by the shoulder blades

View of the shoulder blade from various angles

The shoulder blades are curved inward because they move along the oval ribs.

■ Aerial posture with body leaning forward



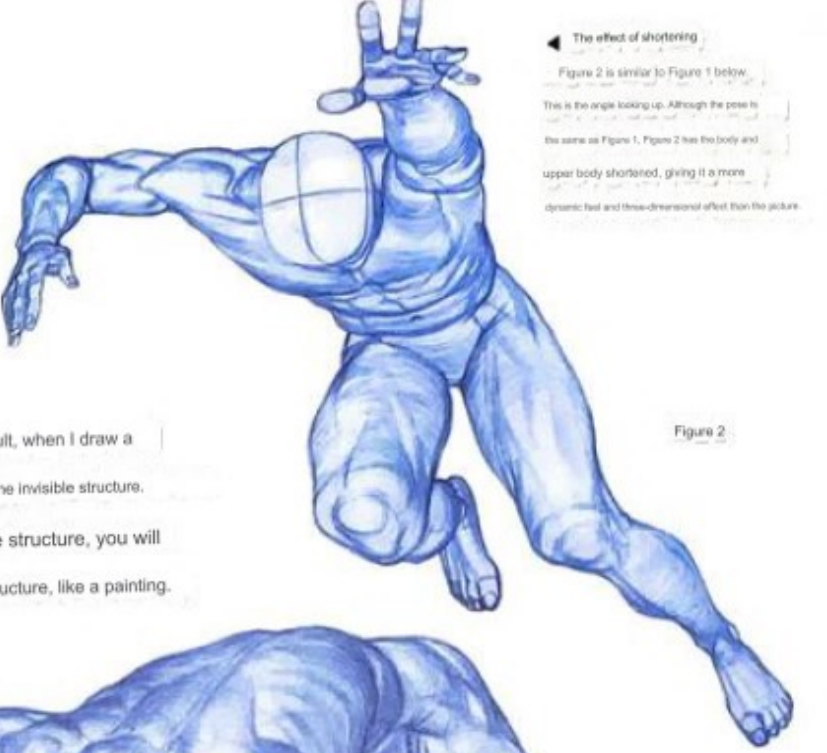


Picture A

Why the human body is drawn flat

When we look at any object, we first see its silhouette. As a result, when I draw a picture, I get caught up in the outline silhouette and cannot think about the invisible structure.

If you draw based on silhouette without understanding the structure, you will end up drawing a human body that is flat and has an unclear structure, like a painting.

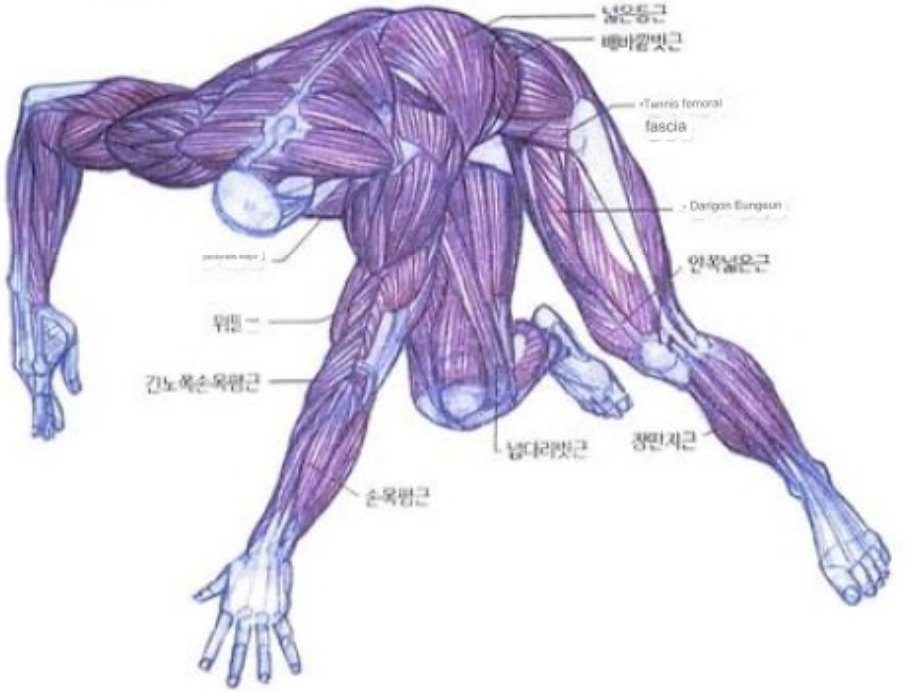


◀ The effect of shortening

Figure 2 is similar to Figure 1 below.

This is the angle looking up. Although the pose is the same as Figure 1, Figure 2 has the body and upper body shortened, giving it a more dynamic feel and three-dimensional effect than the picture.

Figure 2



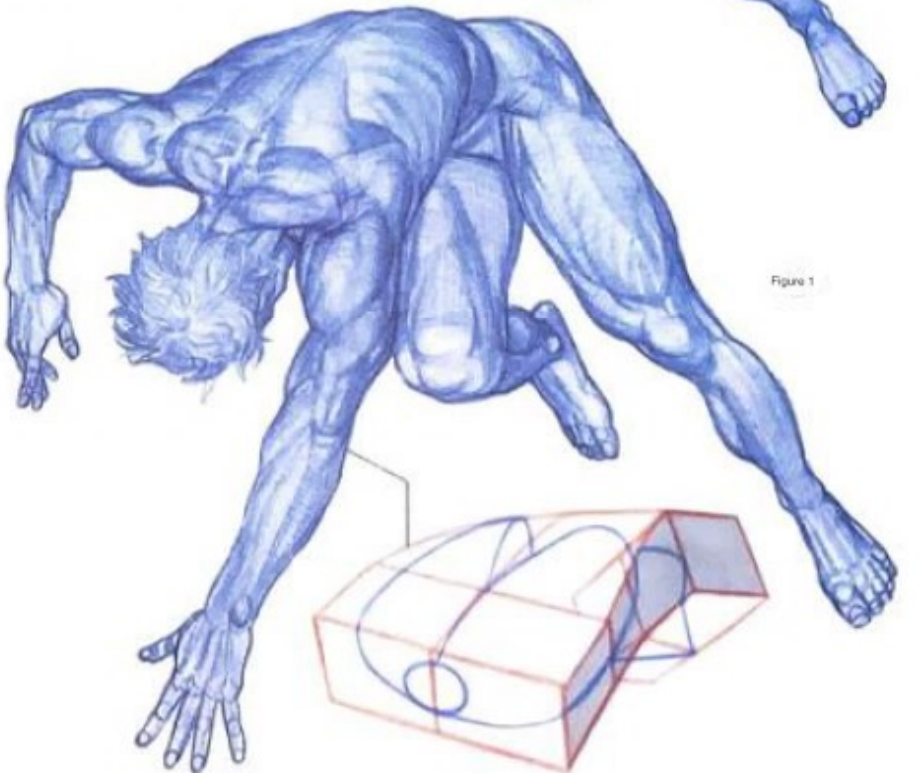
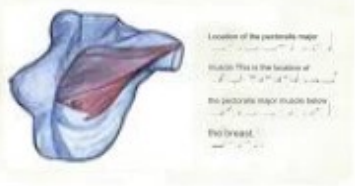


Figure 1

■ Aerial posture that highlights the flow of a woman



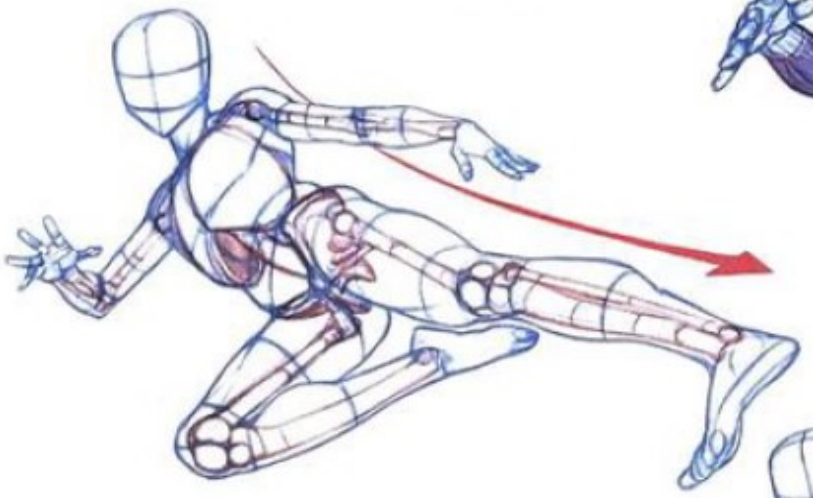
The importance of angles

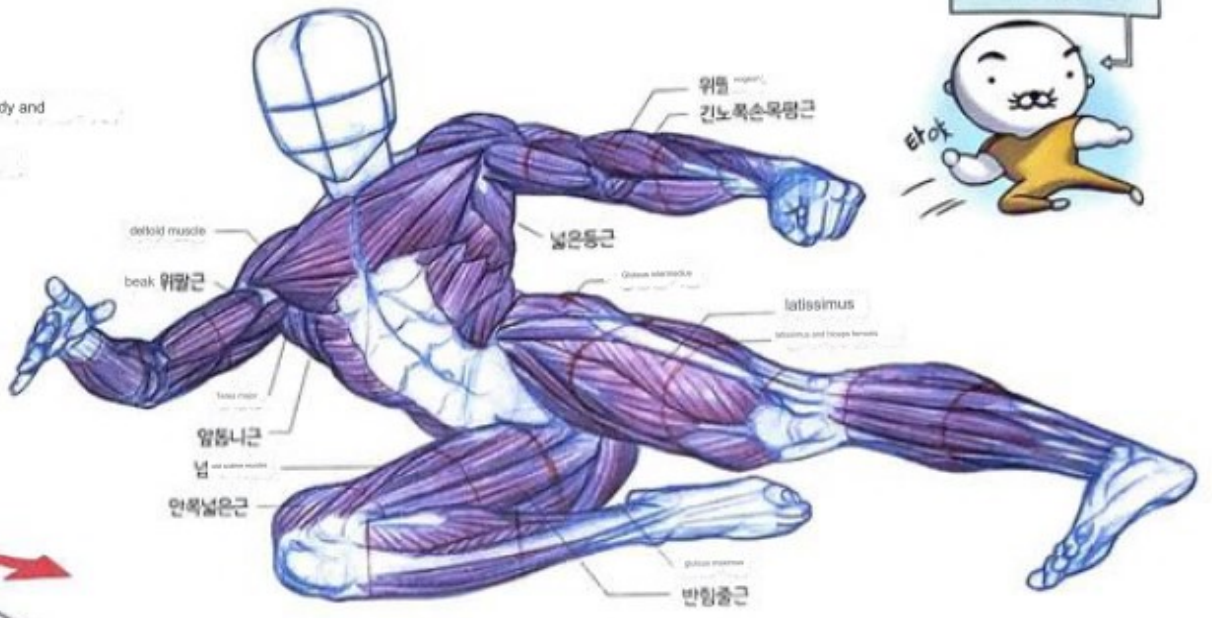
As much research is done on good posture, research on angles is also important. This picture on the left, viewed from a low angle, gives a different feeling due to the change in angle even though the pose is the same.

■ Flying kick posture

Characteristics of the flying kick posture

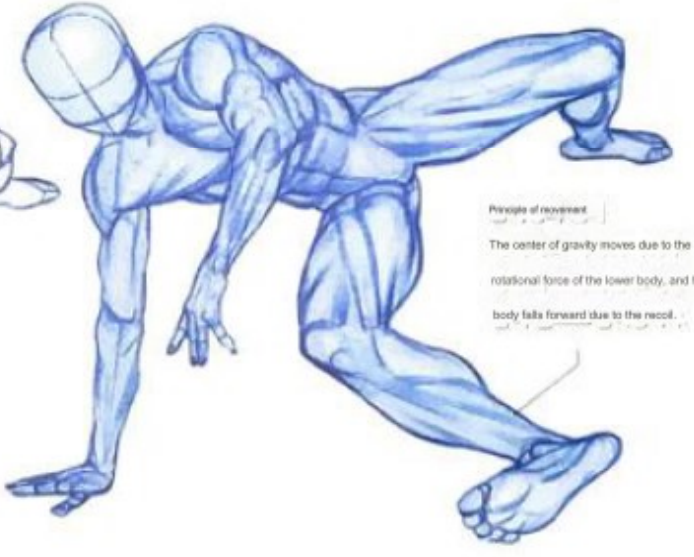
This is a posture in which you run forward, jump while crouching, and then straighten your body and combine the power of running and the power of stretching your body into your toes to strike the opponent. The characteristic of this movement is that, like the flow of an arrow, the flow of the waist tilted back is connected to the straight legs.





Why is my shoulder on the floor not raised?

Just because you put your arm on the floor doesn't mean your shoulder will necessarily go up; the movement of your shoulder also changes depending on the situation. In this position, the arm resting on the floor serves to push the body off the ground, so the shoulder should not go down.



Principle of movement

The center of gravity moves due to the rotational force of the lower body, and the body falls forward due to the recoil.

◀ Incorrect flying kick posture

At first glance, it looks like a flying kick posture similar to the other pictures. This is an incorrect posture where the stretched leg is reversed. You can't actually kick with the lower leg. This position is similar to a soccer tackle position in contact with the ground, not in the air.

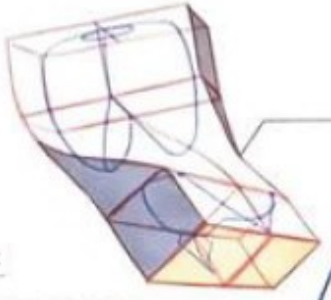
short and long bends

In men, short flows are created by muscle flexions, while in women, the flows are created by long flexions. This is why women with long curves appear more dynamic than men.

Strengths of the body box

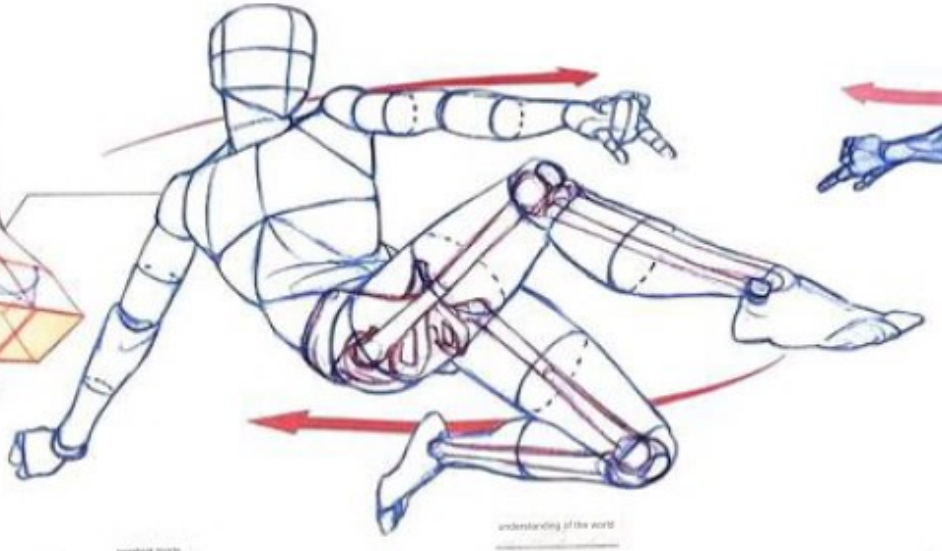
Through the torso box, you can clearly observe the structure of the body leaning backwards. If you calculate the flow of the body as a box like this, you can clearly understand the degree of inclination, which is difficult to see in curved shapes.

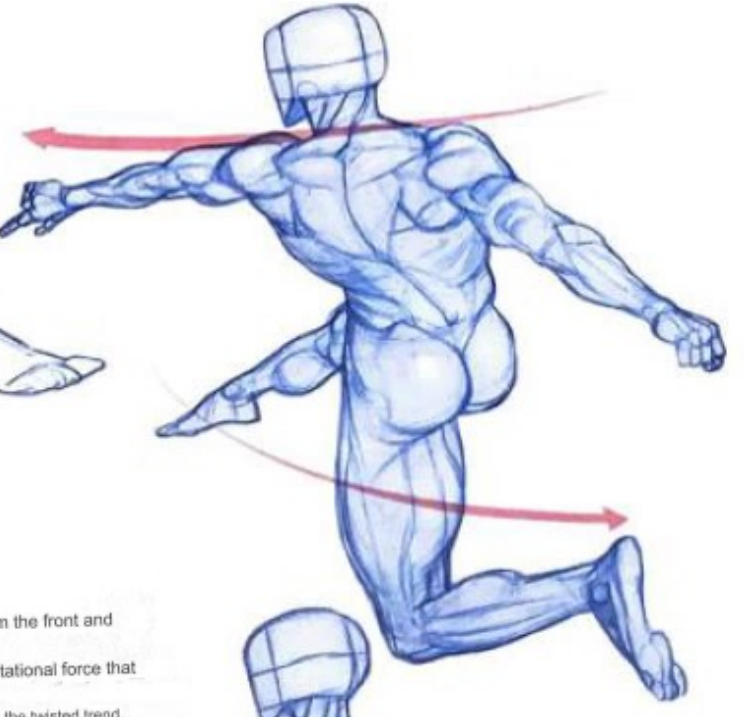
■ Position with arms extended forward in the air



bottom of box

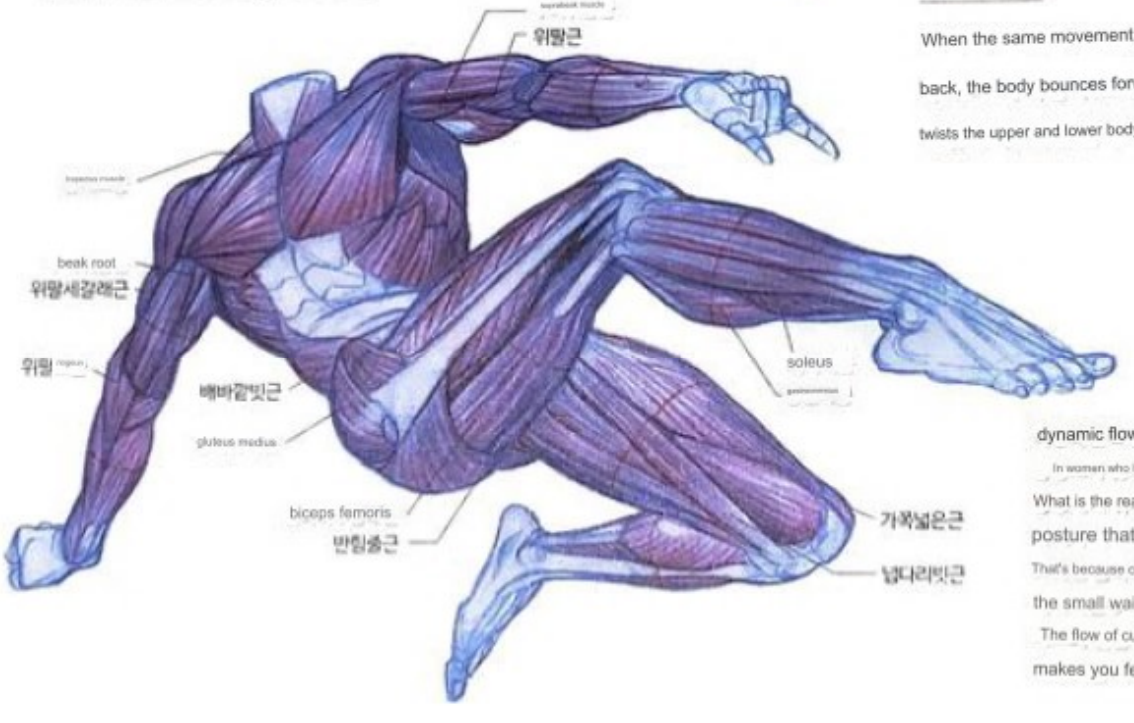
If you can see the bottom of the pelvic box, it means it's close to a low angle. Check how much of the bottom of the pelvic box is visible in any posture.

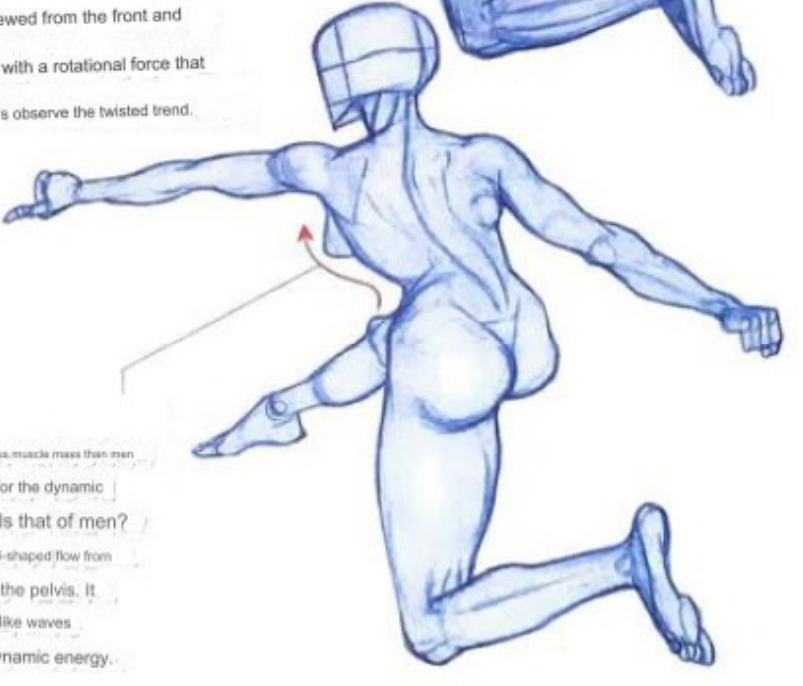




understanding of the world

When the same movement is viewed from the front and back, the body bounces forward with a rotational force that twists the upper and lower body. Let's observe the twisted trend.





dynamic flow

In women who have less muscle mass than men

What is the reason for the dynamic posture that rivals that of men?

That's because of the S-shaped flow from the small waist to the pelvis. It

The flow of curves like waves makes you feel dynamic energy.

Understanding form through flow

To understand the shape of a shortened arm extended forward, let's simplify the muscles and observe the flow of curves across them.

How to draw a twisted waist

In order to draw dynamic postures, twisting of the upper and lower body is important. The curve created as the waist rotates is what makes the human body most dynamic. So what are three things you need to know when drawing a twisted waist?

First, waist length in a twisted state

Second, the range of motion of the rotating waist

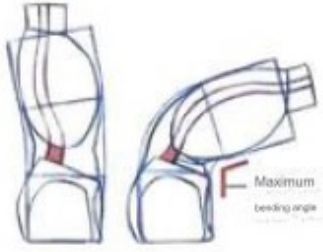
Third, let's observe the pictures on this page in three orders: the direction of the wrinkles that form on the waist and the shape of the muscles.

Compare the positions marked by color to see how the bone appears on the outside.

Observe the shape of the foot as seen from below.

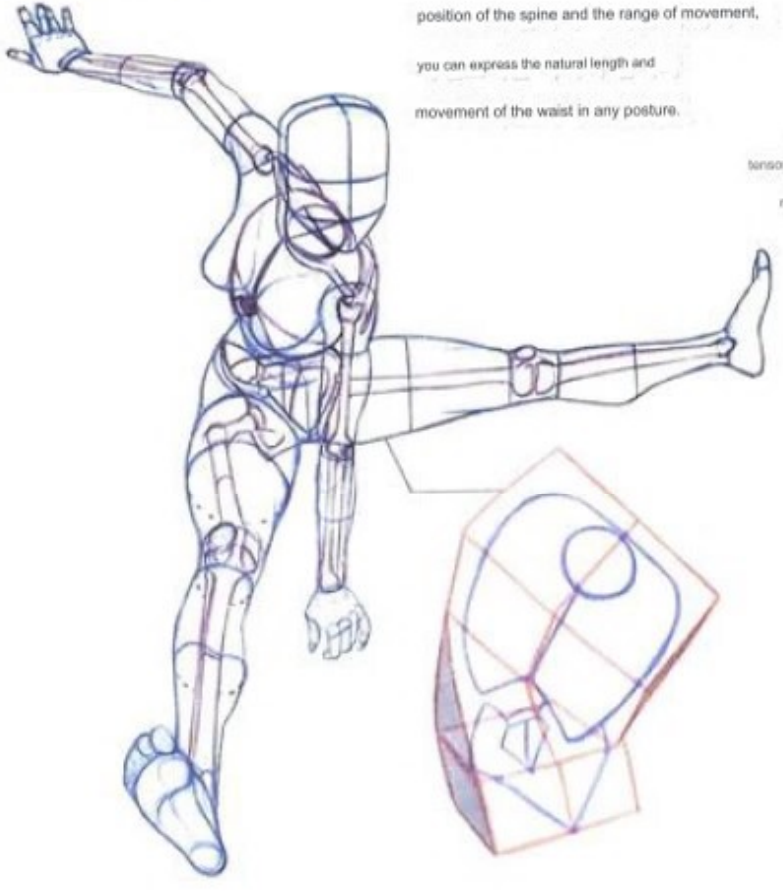
Observe the same posture of the waist from different angles and understand its shape three-dimensionally.

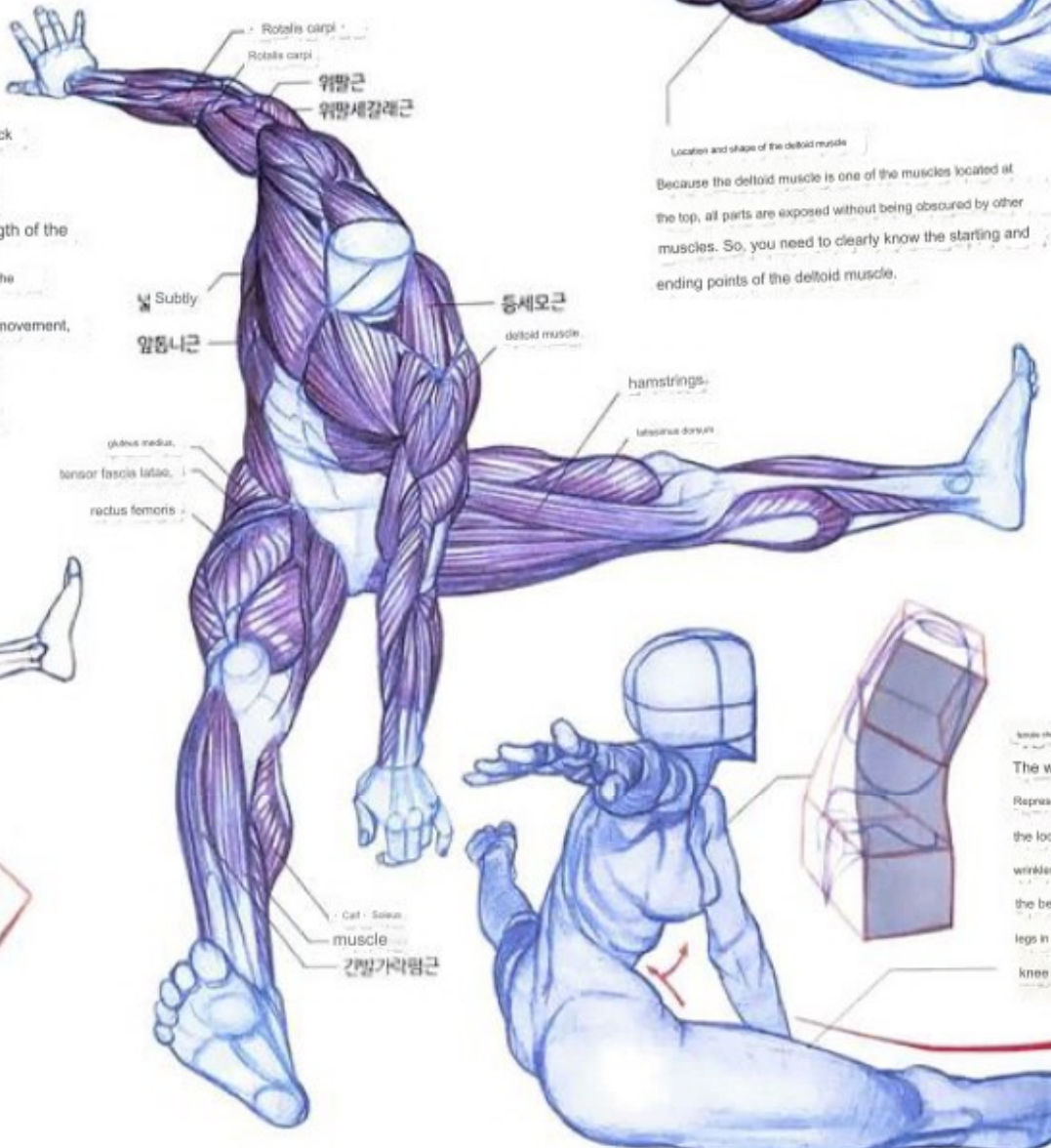
■ Attitude to overcome obstacles

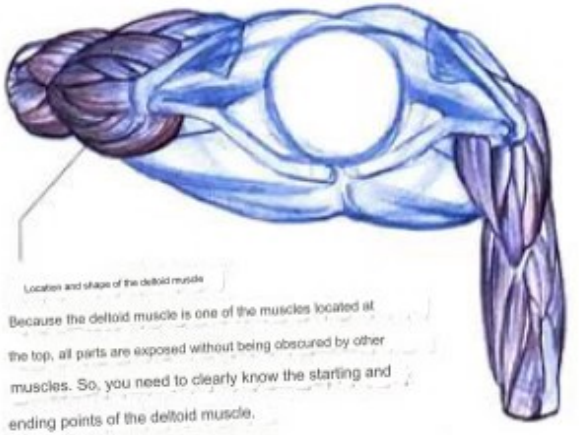


Spine, the standard for waist length

The skin area on your stomach and back changes depending on the movement of your lower back. However, the length of the spine does not change. If you know exactly the position of the spine and the range of movement, you can express the natural length and movement of the waist in any posture.

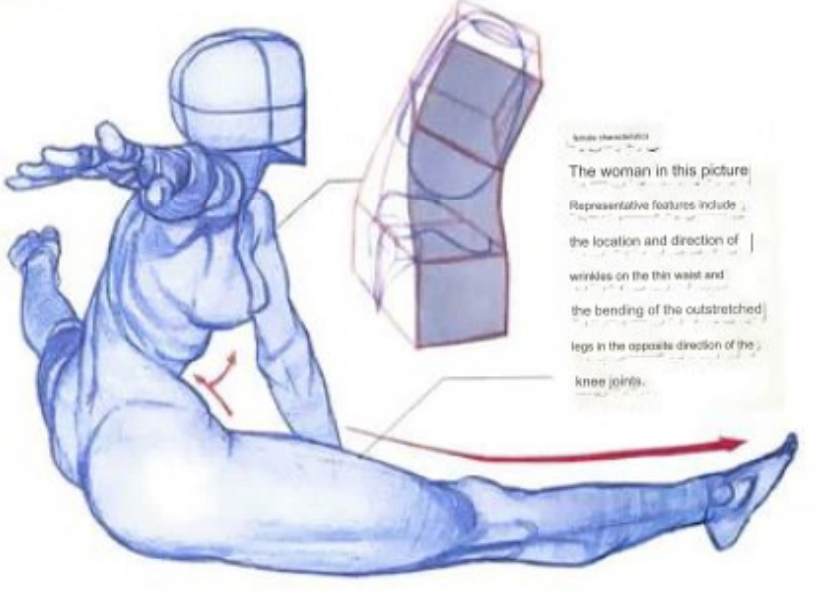




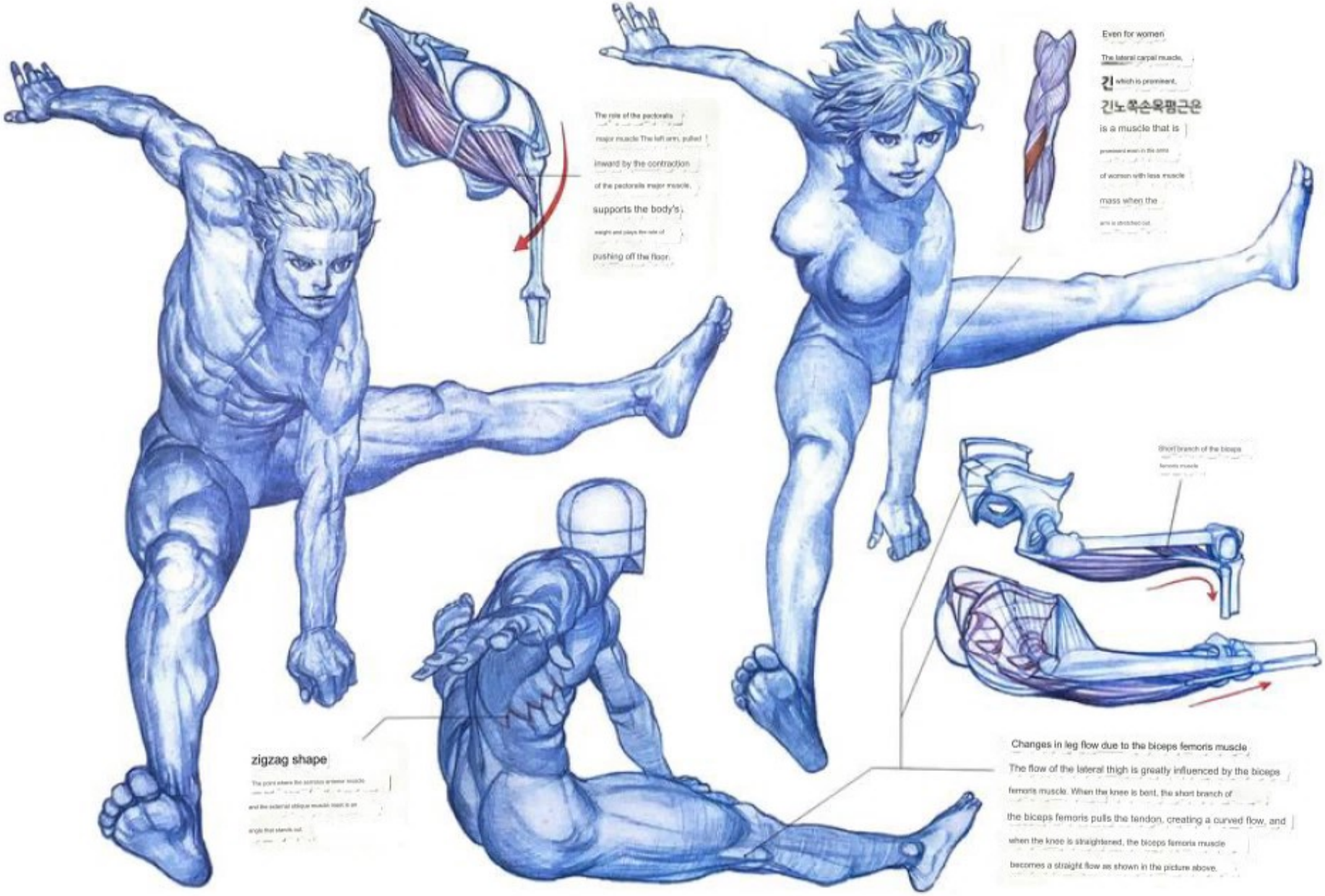


Location and shape of the deltoid muscle

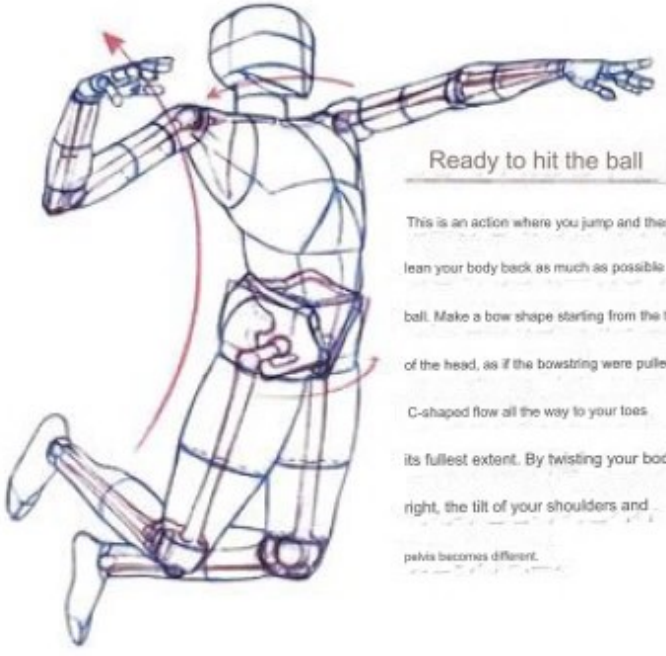
Because the deltoid muscle is one of the muscles located at the top, all parts are exposed without being obscured by other muscles. So, you need to clearly know the starting and ending points of the deltoid muscle.



The woman in this picture Representative features include the location and direction of wrinkles on the thin waist and the bending of the outstretched legs in the opposite direction of the knee joints.

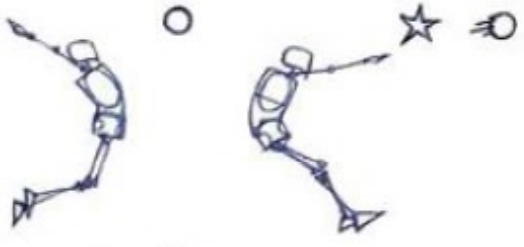

The role of the pectoralis
major muscle The left arm, pulled
inward by the contraction
of the pectoralis major muscle,
supports the body's
weight and plays the role of
pushing off the floor.
Even for women
The lateral carpal muscle,
긴 which is prominent,
긴노쪽손목폄근은
is a muscle that is
of women with less muscle
mass when the
arm is stretched out.
(Short) branch of the biceps
femoris muscle
zigzag shape
Changes in leg flow due to the biceps femoris muscle
The flow of the lateral thigh is greatly influenced by the biceps
femoris muscle. When the knee is bent, the short branch of
the biceps femoris pulls the tendon, creating a curved flow, and
when the knee is straightened, the biceps femoris muscle
becomes a straight flow as shown in the picture above.

■ Volleyball posture



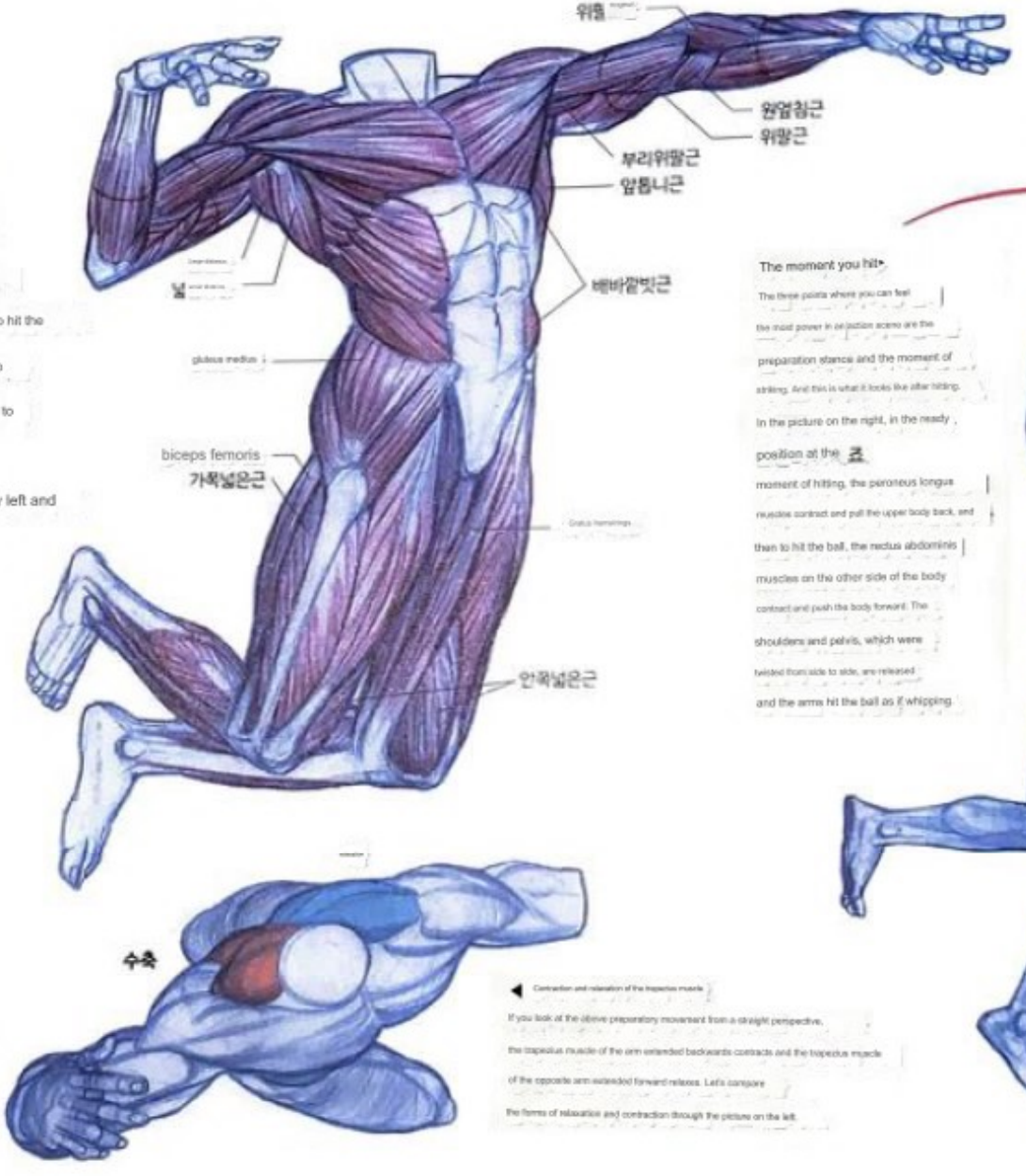
Ready to hit the ball

This is an action where you jump and then lean your body back as much as possible to hit the ball. Make a bow shape starting from the tip of the head, as if the bowstring were pulled to C-shaped flow all the way to your toes its fullest extent. By twisting your body left and right, the tilt of your shoulders and pelvis becomes different.



posture of hitting the ball

Curve your body backwards like a bow, then use the maximum force to bounce forward and hit the ball. The flow of the body, which is bent in a C-shape, becomes a C-shape again in the opposite direction after hitting. In an airborne position, the direction of force is more important than the center of gravity.



The moment you hit

The three points where you can feel the most power in an action scene are the preparation stance and the moment of striking. And this is what it looks like after hitting.

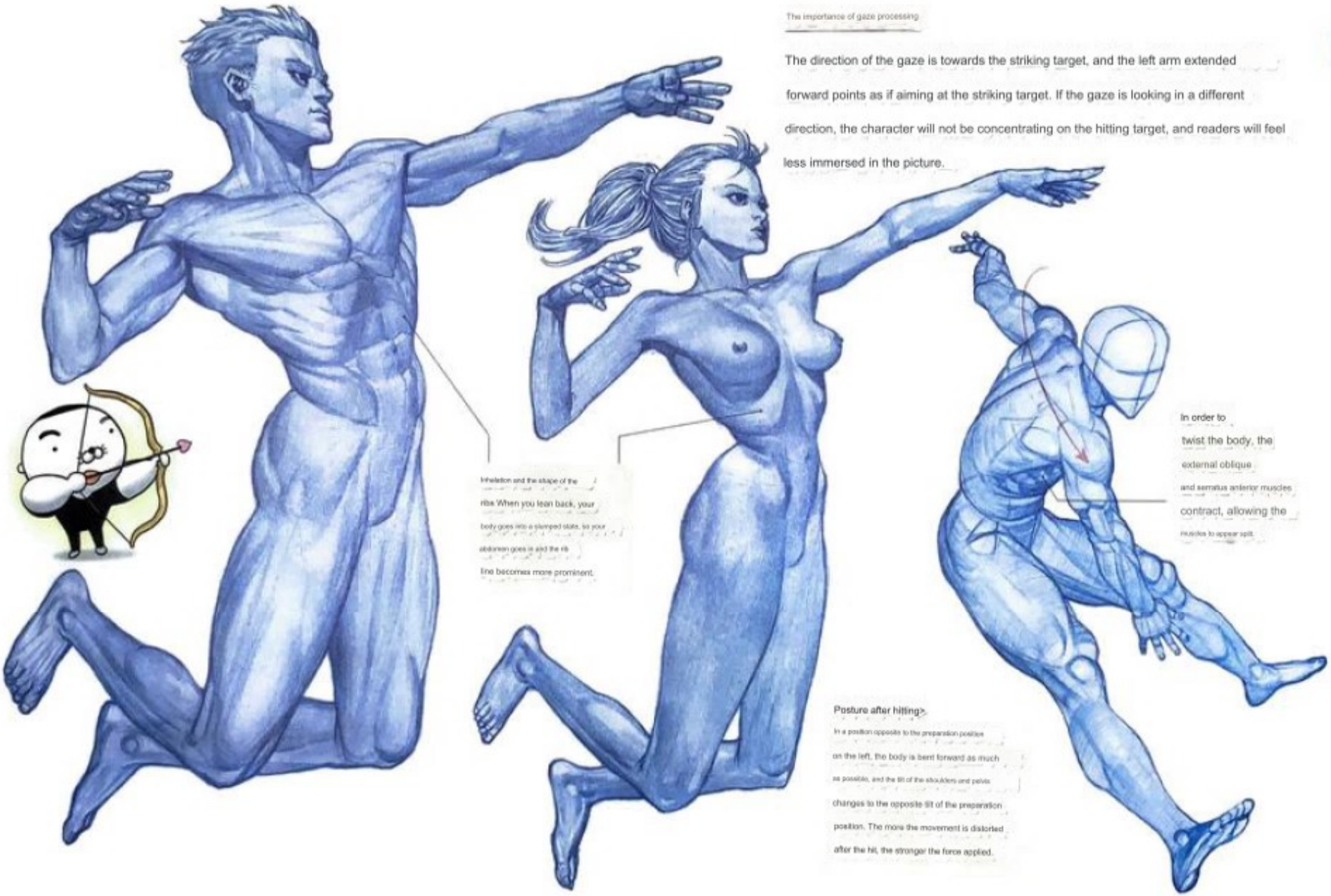
In the picture on the right, in the ready position at the 귶 moment of hitting, the peroneus longus muscles contract and pull the upper body back, and then to hit the ball, the rectus abdominis muscles on the other side of the body contract and push the body forward. The shoulders and pelvis, which were twisted from side to side, are released and the arms hit the ball as if whipping.

◀ Contraction and relaxation of the trapezius muscle

If you look at the above preparatory movement from a straight perspective, the trapezius muscle of the arm extended backwards contracts and the trapezius muscle of the opposite arm extended forward relaxes. Let's compare the forms of relaxation and contraction through the picture on the left.

The importance of gaze processing

The direction of the gaze is towards the striking target, and the left arm extended forward points as if aiming at the striking target. If the gaze is looking in a different direction, the character will not be concentrating on the hitting target, and readers will feel less immersed in the picture.



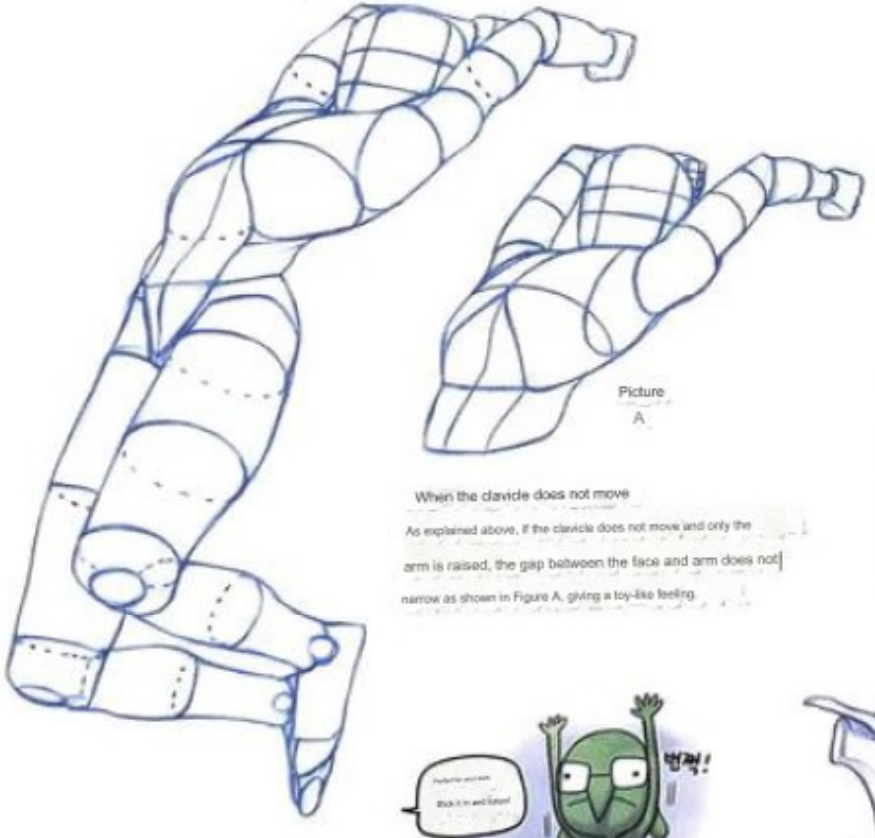
■ Jump posture

reclining posture

If you raise your arms while leaning your upper body back, your rib line will be exposed due to the inhalation.

The length or volume does not change depending on the movement, so if you apply flesh

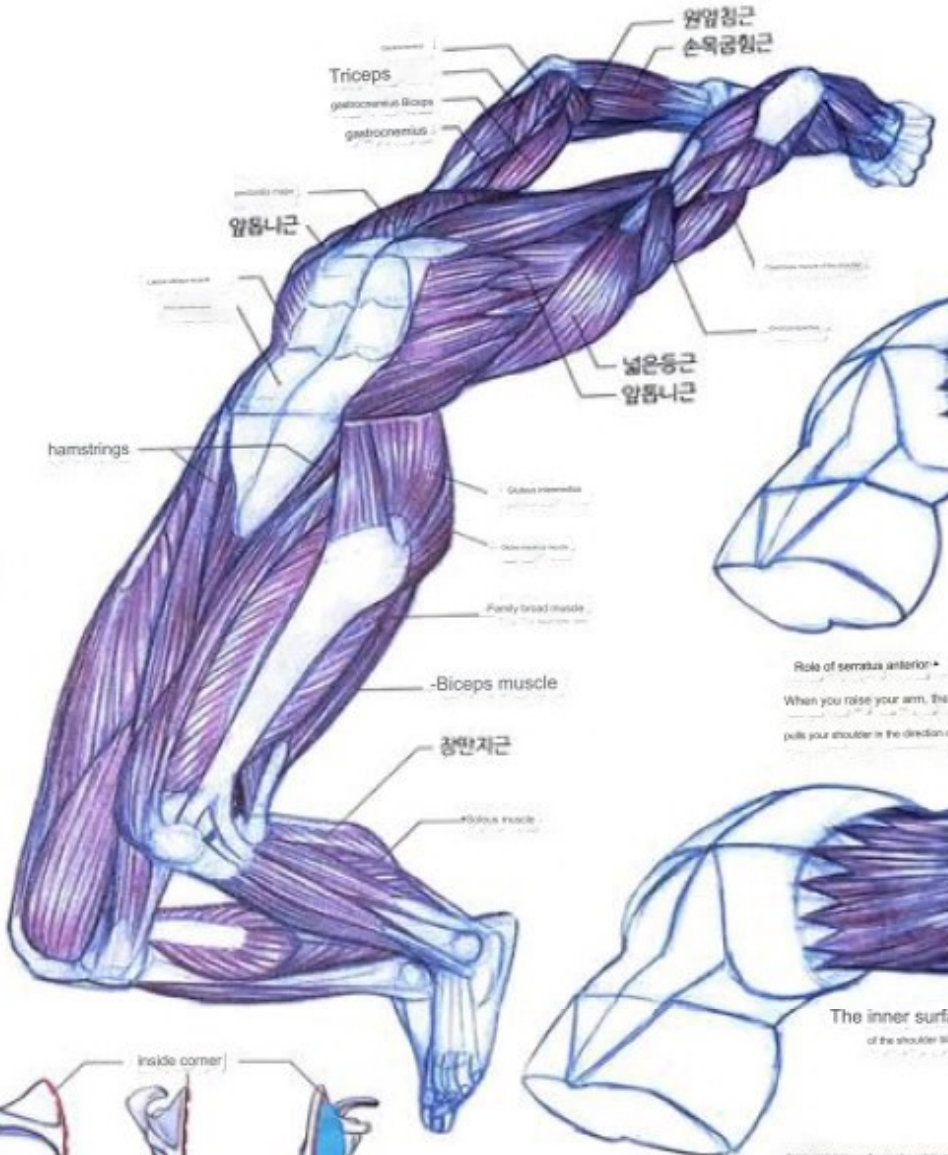
based on the skeleton, you can maintain the proportions of the human body even in difficult positions.

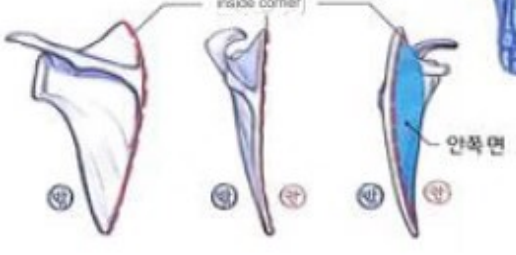


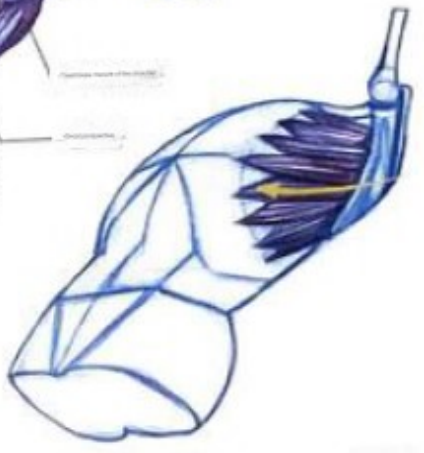
Picture
A

When the clavicle does not move

As explained above, if the clavicle does not move and only the arm is raised, the gap between the face and arm does not narrow as shown in Figure A, giving a toy-like feeling.



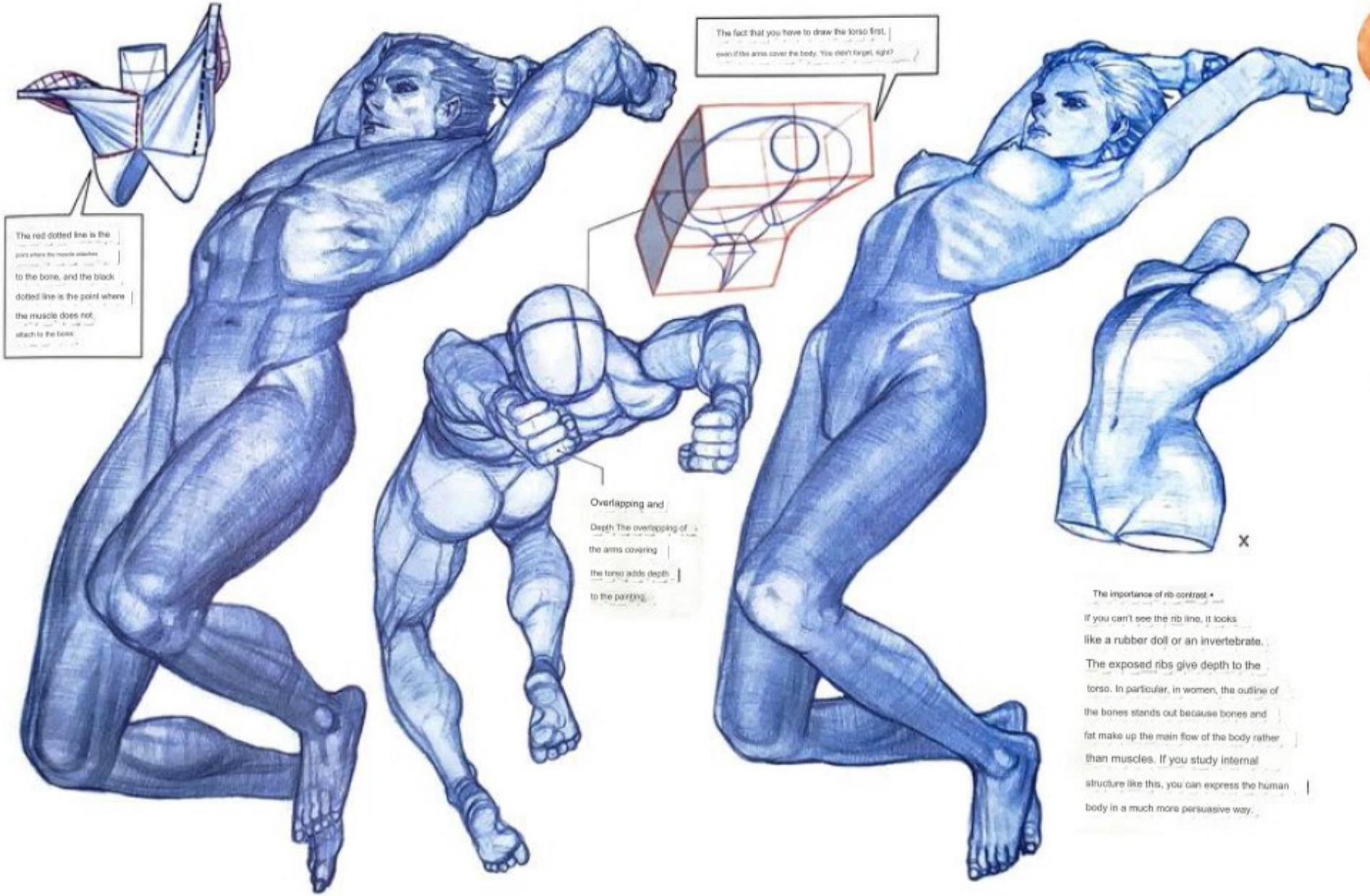




Role of serratus anterior

When you raise your arm, the serratus anterior muscle pulls your shoulder in the direction of the arrow.

Relationship between the serratus anterior muscle and the scapula The serratus anterior muscle ends at the inner edge of the shoulder blade. The scapula is a structure that covers the serratus anterior muscle.


The red dotted line is the point where the muscle attaches to the bone, and the black dotted line is the point where the muscle does not attach to the bone.
The fact that you have to draw the torso first, even if the arms cover the body. You didn't forget, right?
Overlapping and Depth The overlapping of the arms covering the torso adds depth to the painting.
The importance of rib contrast •
If you can't see the rib line, it looks like a rubber doll or an invertebrate. The exposed ribs give depth to the torso. In particular, in women, the outline of the bones stands out because bones and fat make up the main flow of the body rather than muscles. If you study internal structure like this, you can express the human body in a much more persuasive way.

5 Offensive and defensive application posture

■ Basic fighting stance

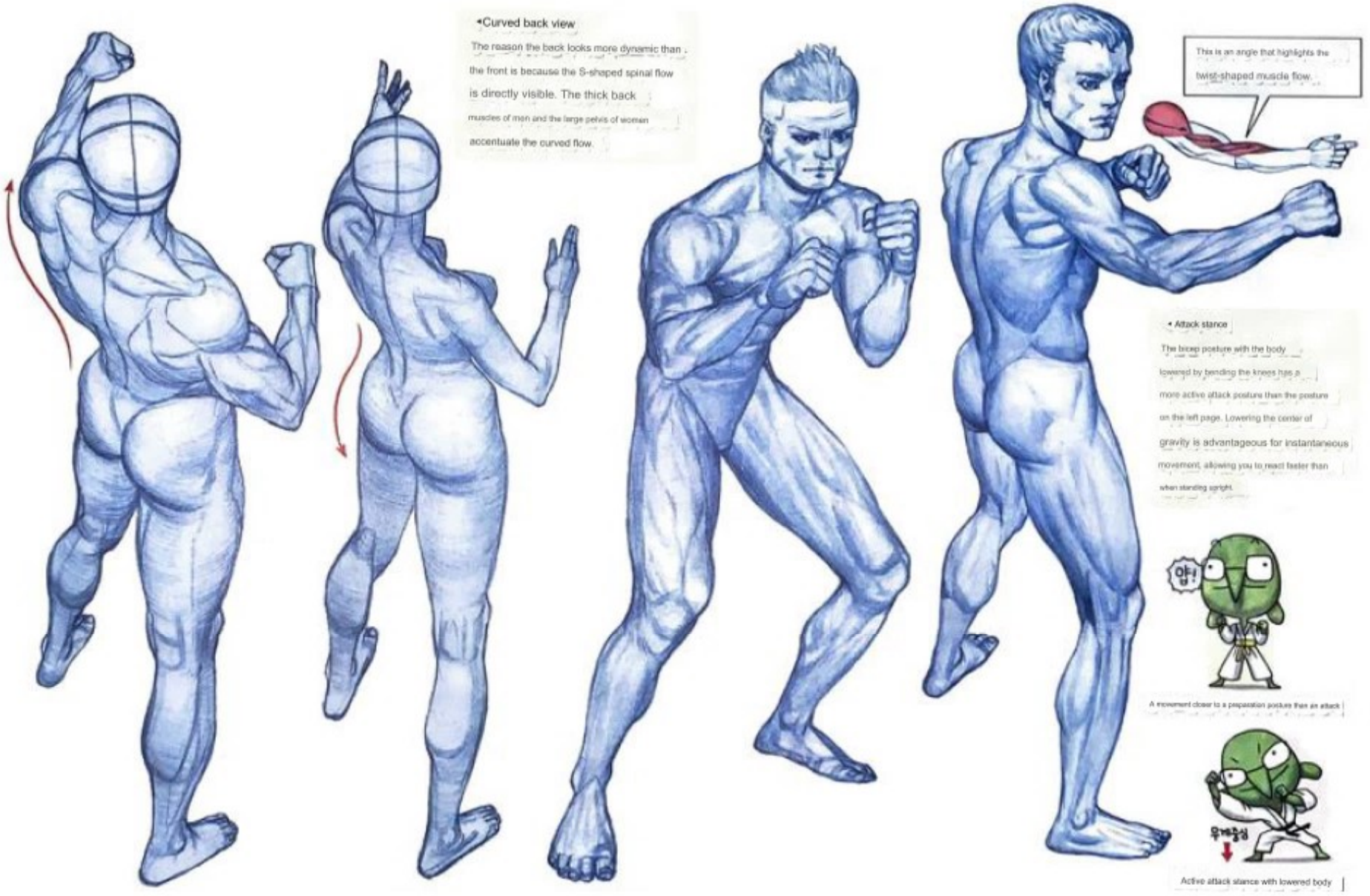
❶

❷

❸

Foot position in fighting stance

The basic fighting stance is to turn your body 45 degrees and look straight ahead. When your body is turned at a 45-degree angle, your feet will be in the same position as number 2. You can stand without losing your balance due to shocks from the front, back, left and right sides, so when fighting, you can take the hit in a diagonal direction to avoid falling from the opponent's attacks. Foot position number 2 can be seen not only in fighting stances but also in everyday life. When maintaining balance in a shaking bus or on slippery ice, the feet are spread diagonally. Foot position number 2 is the standing foot position, which makes it most prone to falling when receiving an external shock. It's posture. The position of the second foot, which is spread to the left and right, is stable against impacts from the left and right, but is unstable against impacts from the front and rear.



◂Curved back view

The reason the back looks more dynamic than the front is because the S-shaped spinal flow is directly visible. The thick back muscles of men and the large pelvis of women accentuate the curved flow.

This is an angle that highlights the twist-shaped muscle flow.

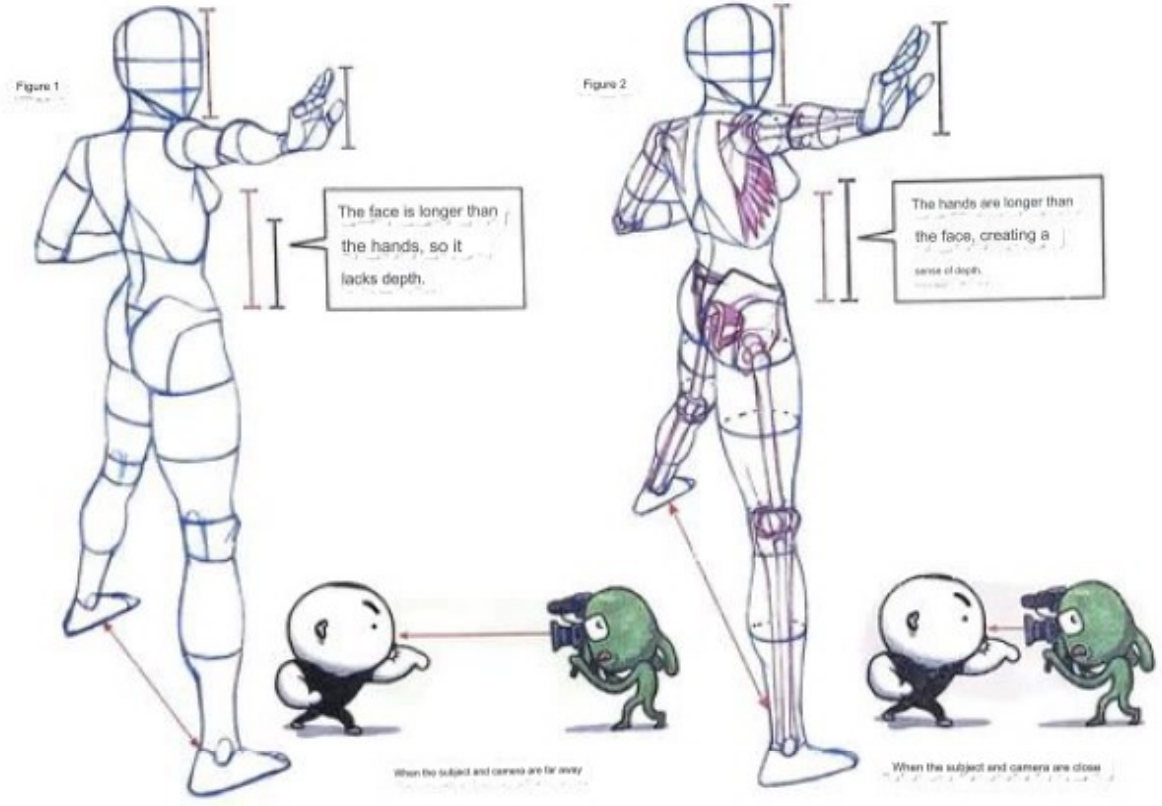
◂ Attack stance

The bicep posture with the body lowered by bending the knees has a more active attack posture than the posture on the left page. Lowering the center of gravity is advantageous for instantaneous movement, allowing you to react faster than when standing upright.

A movement closer to a preparation posture than an attack

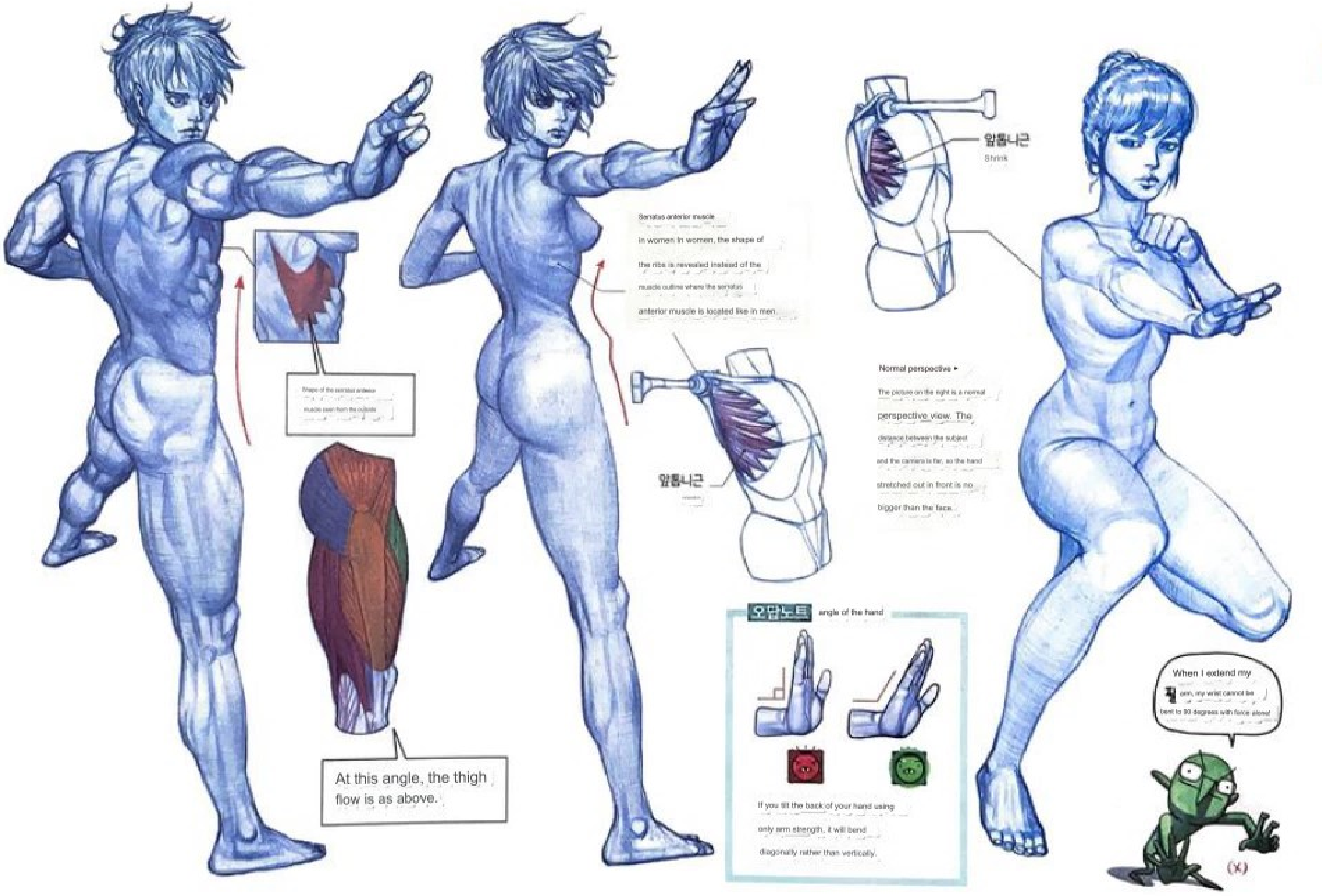
Active attack stance with lowered body

■ Basic fighting stance with one hand out

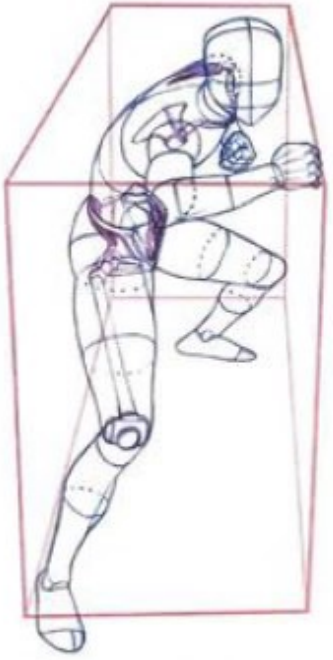


Differences in images resulting from the distance between the camera and the subject

There are two ways to foreshorten. One method is to zoom in on the camera lens to photograph a subject, and the other method is to have the camera approach the subject directly and take a picture. Figure 1 was taken using a camera, and this method is used when you want to express a general image rather than a sense of depth. Figure 2 is a photo taken by approaching the subject directly, and is used when the three-dimensional effect of the subject is clearly displayed, thereby maximizing realism and presence. In American superhero comics, things are depicted from the camera's direct perspective to create a sense of urgency or dynamic situation. The method is to create a size difference between the object near the screen and the object behind it. As shown in Figure 2, when reaching out toward the screen, the hand in front is expressed larger than the face behind it, giving the impression that the situations on the screen are happening close to the screen.


Serratus anterior muscle
In women In women, the shape of
the ribs is revealed instead of the
muscle outline where the serratus
anterior muscle is located like in men.
앞톱니근
Shrink
앞톱니근
Normal perspective ▸
The picture on the right is a normal
perspective view. The
distance between the subject
and the camera is far, so the hand
stretched out in front is no
bigger than the face.
At this angle, the thigh
flow is as above.
오답노트 angle of the hand
If you tilt the back of your hand using
only arm strength, it will bend
diagonally rather than vertically.
When I extend my
arm, my wrist cannot be
bent to 90 degrees with force alone!
(X)

■ Fighting preparation posture seen from a high angle

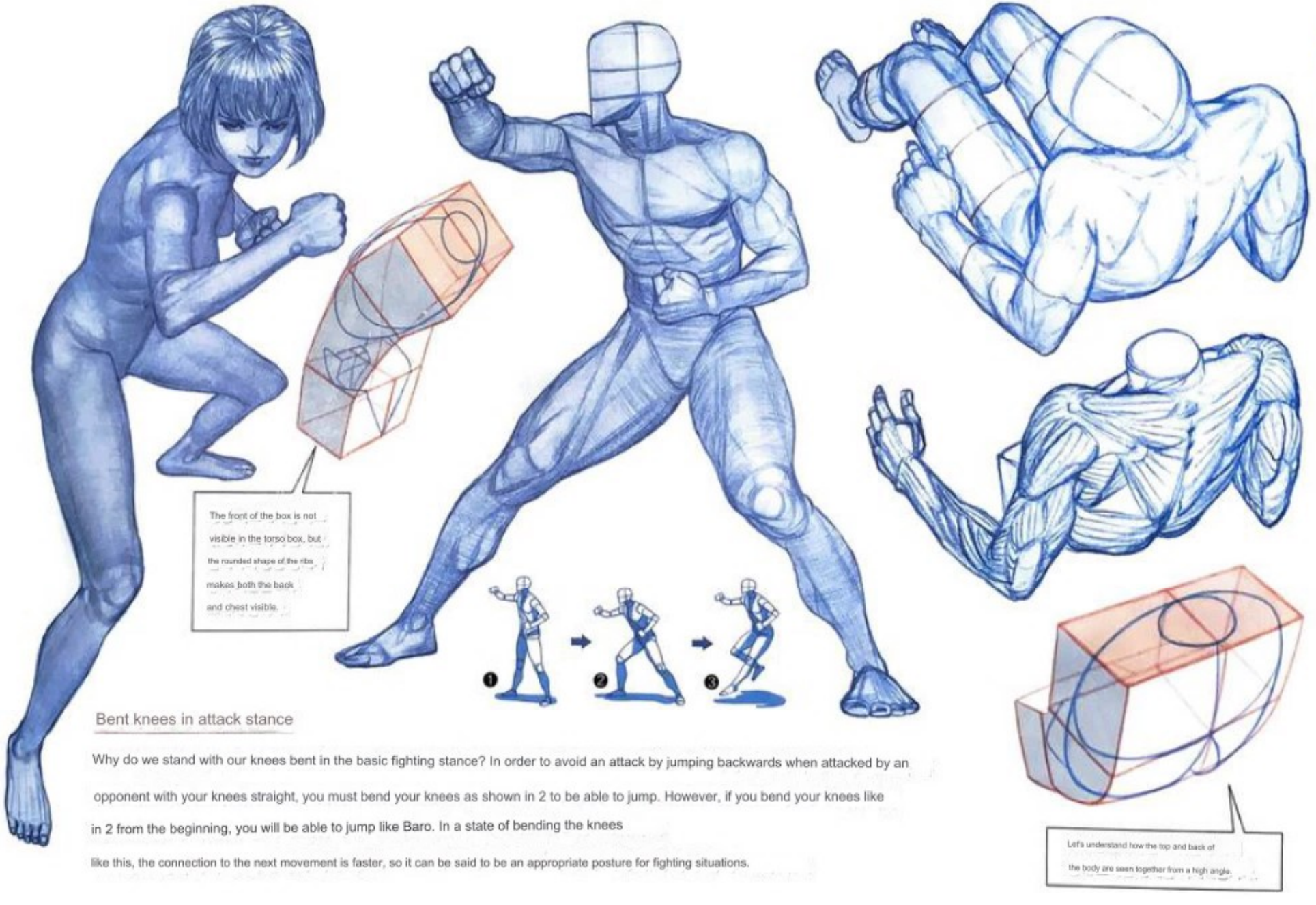


High angle action pose drawing

High angle three-point perspective gives a more colorful and dynamic feel than normal perspective, and is often used in action scenes as it is suitable for emphasizing the object in front of the screen and creating a dynamic scene. If you analyze the upper body 터 posture on this page, the arm extended forward is in a posture to defend the face, and the arm pulled back is a posture ready for a punch attack. In the lower body, bend both knees and take wide strides with your feet diagonally, taking an offensive and defensive stance that allows you to quickly move back and forth and left and right.

How to study natural drawing of the human body

When studying anatomy, it is very important to understand how muscle information actually appears on the outside. In order to understand where the boundaries of muscles are emphasized and where the flow is tied, repeated drawing practice should be conducted by comparing and analyzing nude photo data of various body types.



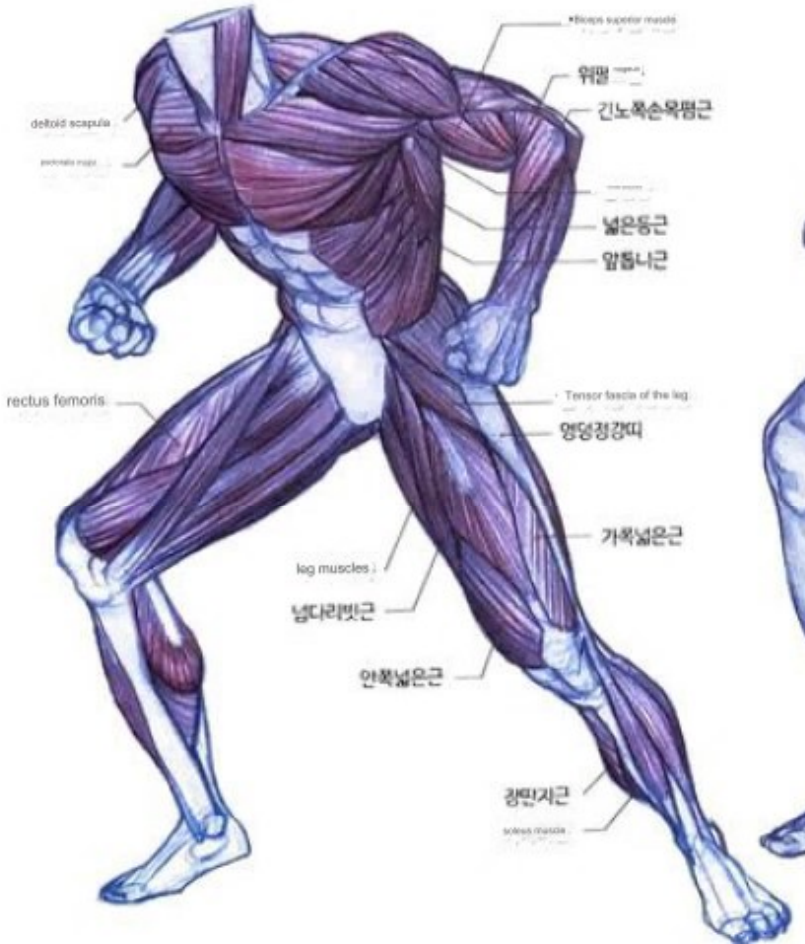
Bent knees in attack stance

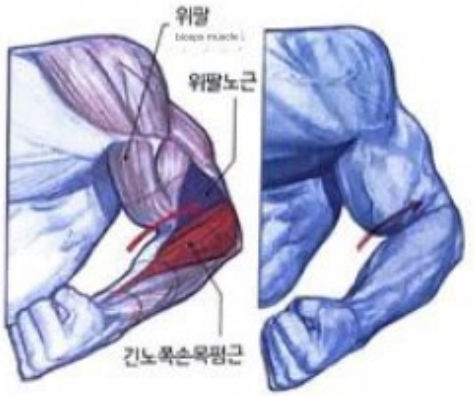
Why do we stand with our knees bent in the basic fighting stance? In order to avoid an attack by jumping backwards when attacked by an opponent with your knees straight, you must bend your knees as shown in 2 to be able to jump. However, if you bend your knees like in 2 from the beginning, you will be able to jump like Baro. In a state of bending the knees like this, the connection to the next movement is faster, so it can be said to be an appropriate posture for fighting situations.

■ Attitude that threatens the opponent

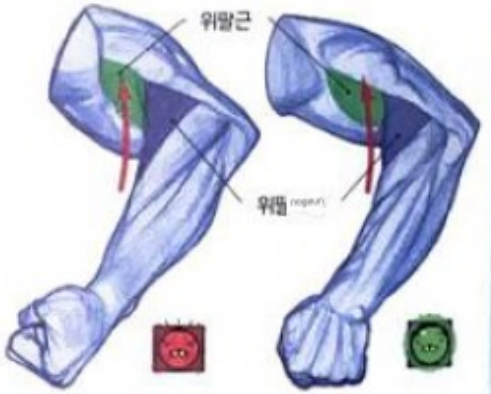
About the direction of wrinkles on the arms

The direction of the wrinkles that form when you fold your arms depends on three situations: First, the direction of the hand, and second, whether or not you are applying force to your arm. Third is the muscle mass of the arms. This time, we will learn about the direction of wrinkles according to the direction of the hand while applying strength to the arm.





Direction of negative wrinkles



When the palm is facing the biceps brachii muscle, no crease should be drawn at the border of the gastrocnemius muscle and the brachioradialis muscle.

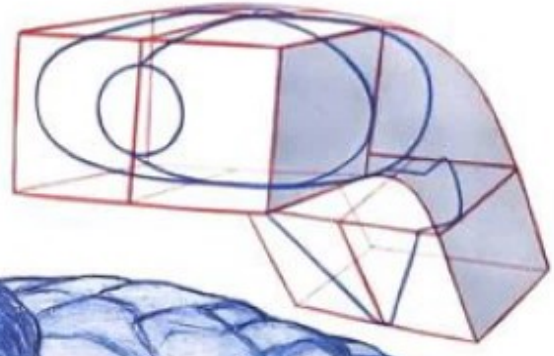
For wrinkles to form at the border between the brachialis muscle and the brachioradialis muscle, it is possible for a man with a muscular body type to bend his arm while applying force with his thumb pointing toward the biceps brachii muscle.

Wrinkles on the arms of women in women with less muscle mass, the wrinkles on the bent arms are almost unaffected by the direction of the hand, so the wrinkles are always in the same position.

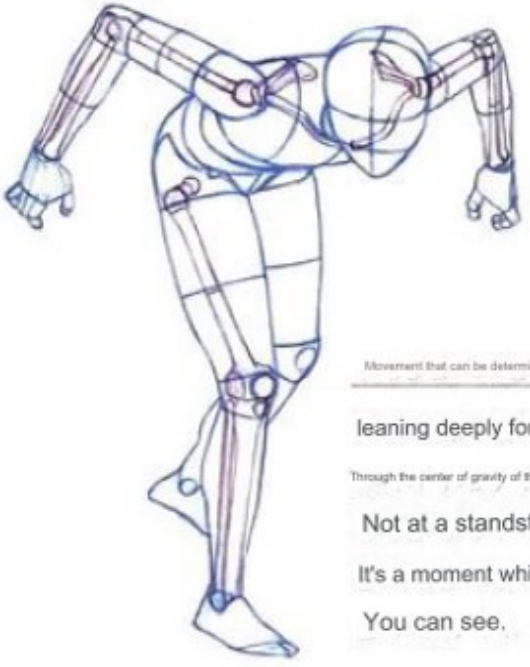
Feeling of intimidation coming from muscles • Although the posture is the same as that of men, women have relatively less muscle mass, so they can feel the feeling of intimidation is reduced.

• Trends change with small differences

The knees are bent and the feet are pointed diagonally, but the reason why it feels like a cautious penetration rather than an attacking posture is because the movement of both hands is not an attacking posture. In order to create a fighting stance, both your lower body and upper body must be in a attacking position.



This posture, in which the body is lowered by bending the waist and knees as much as possible, gives the feeling of rushing forward to attack at any moment. Aggression is strongly felt in movements similar to the running posture learned earlier, as well as in bent arms and clenched fists.



Movement that can be determined by the center of gravity

leaning deeply forward

Through the center of gravity of the upper body

Not at a standstill.

It's a moment while walking

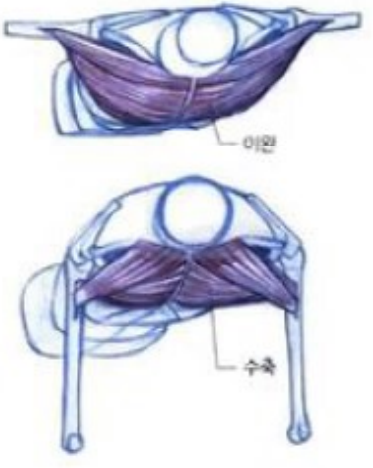
You can see.

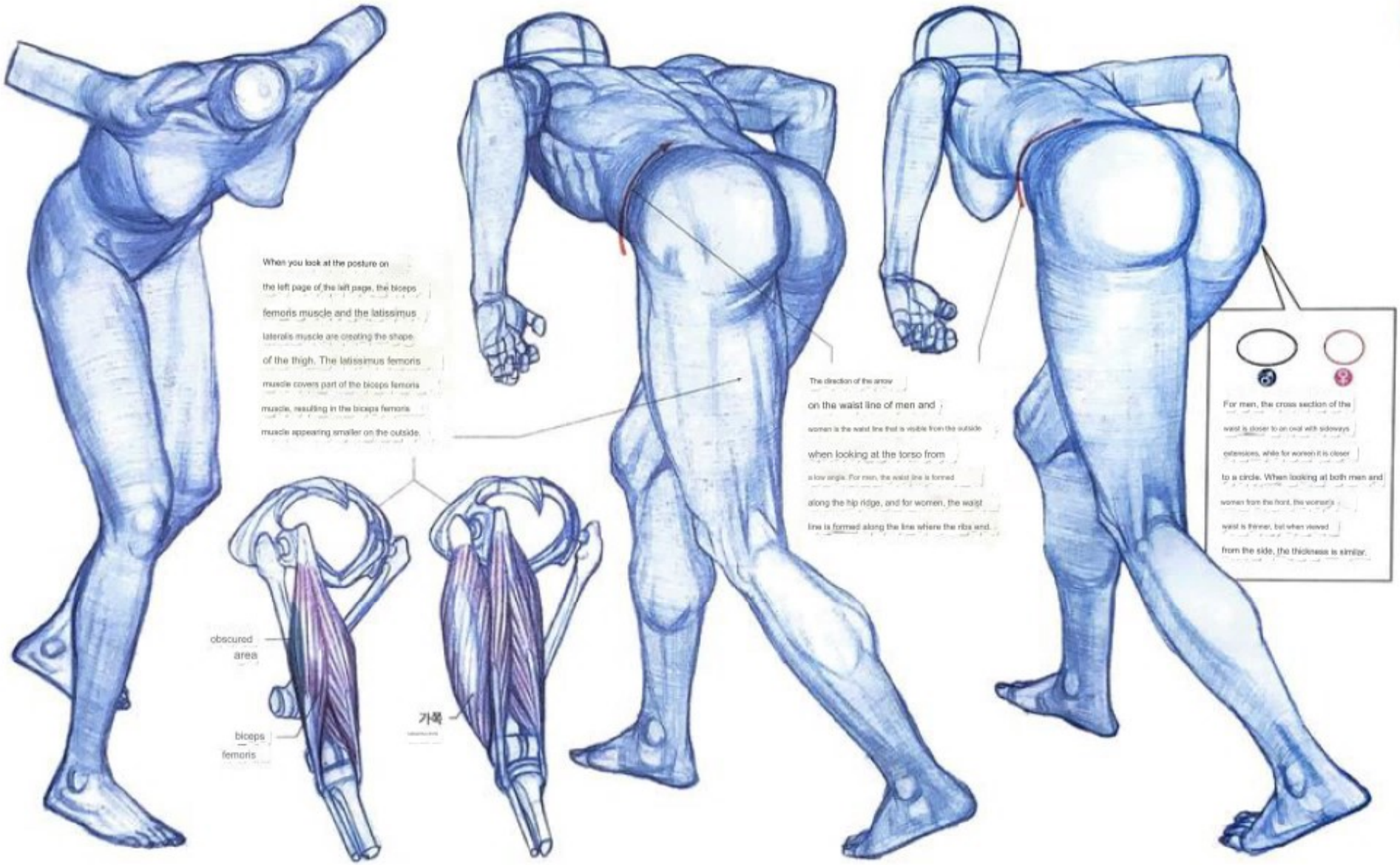
A movement that suits the character

How do you guys see this posture?

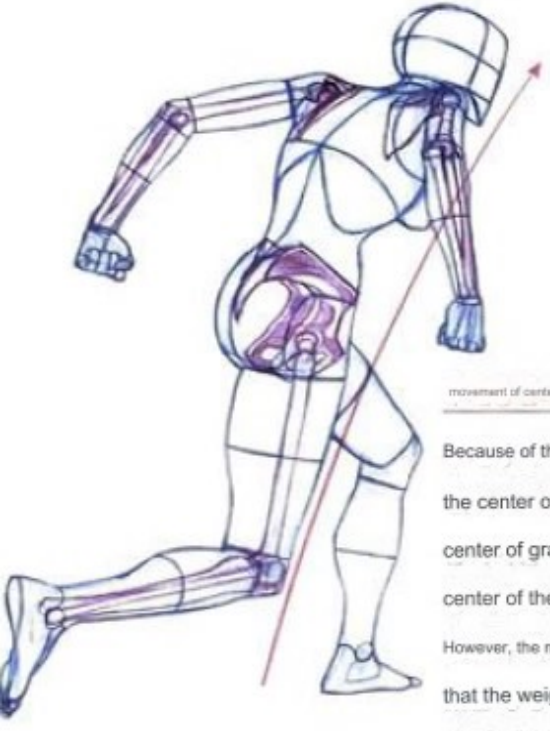
This character, with the concept of having grown up in the wild and not been tarred by human civilization, bows low like a quadrupedal animal and takes a stance to attack with its claws and teeth. In other words, it makes hand gestures that seem to show its claws and pushes its face forward to attack with its teeth. It also highlights the characteristics of a wild animal by spreading its arms out to the sides to make its body appear larger.

Shape of the relaxed pectoralis major muscle As you point your arm toward your back, the back muscles contract and the pectoralis major muscle relaxes.




When you look at the posture on the left page of the left page, the biceps femoris muscle and the latissimus lateralis muscle are creating the shape of the thigh. The latissimus femoris muscle covers part of the biceps femoris muscle, resulting in the biceps femoris muscle appearing smaller on the outside.
obscured area
biceps femoris
가쪽
The direction of the arrow on the waist line of men and women is the waist line that is visible from the outside when looking at the torso from a low angle. For men, the waist line is formed along the hip ridge, and for women, the waist line is formed along the line where the ribs and
For men, the cross section of the waist is closer to an oval with sideways extensions, while for women it is closer to a circle. When looking at both men and women from the front, the women's waist is thinner, but when viewed from the side, the thickness is similar.

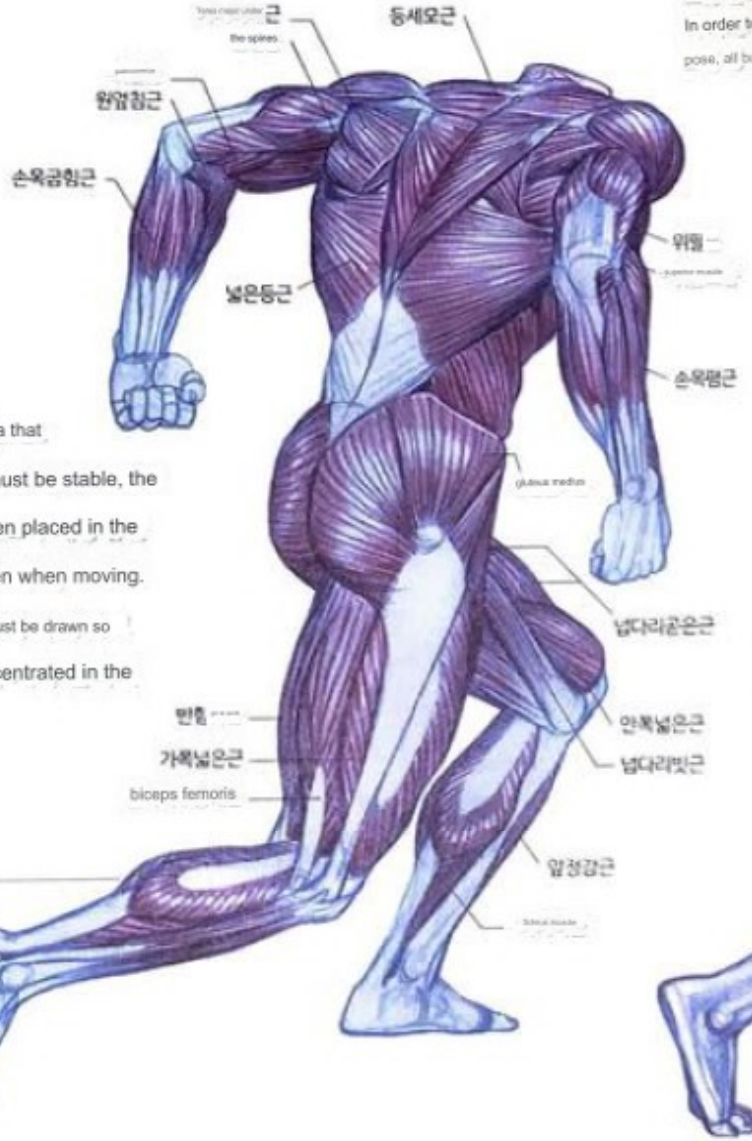
■ Forward posture for attack



movement of center of gravity

Because of the fixed idea that the center of gravity must be stable, the center of gravity is often placed in the center of the body even when moving.

However, the movement must be drawn so that the weight is concentrated in the direction it is facing.



Back muscles react to shoulder movements

Among the externally visible back muscles, excluding the vertebral column,

All muscles are used in shoulder movement.

In order to point your arms towards the east, as in this pose, all back muscles must contract.

Direction of light and

Dark: Contraction of the latissimus

Muscle causes light and dark to move in the direction of the tendons

Difference between sinew and tendon

The tendons create a curved flow and the tendons create a straight flow. If the tendons are expressed in a straight line, it will give the impression of a hard sculpture rather than soft skin. If the tendons are curved, the skeleton will look curved or the flesh will look mushy. As the muscles develop, the volume of the tendons becomes noticeable. Although it gets bigger, the thickness of the tendon does not become as thick as tendon muscle.

We know more about the wrists and ankles than other parts because they are made up only of tendons.

Differences in the spine line

between men and women: Men have a rounder spine due to the volume of their muscles, while women have a more gentle curve than men.

Two props 왕방울이 were stolen, right?

?!

When you look directly at running, you can more clearly observe the tilt of the shoulders and pelvis.

Direction of the legs and pelvis The pelvis is always oriented along the forward leg.

Hip bit and tendons •

The flow of the human body is created by the curves of tendons and the straight lines of tendons, so observe carefully the points where the flow changes.

Application of

posture To draw a natural waist and waist, you need to know the characteristics of each waist and waist, so you need to do a lot of research on your daily posture. The purpose of this posture changes depending on what you are holding in your hand. Examples include weapons and luggage, as shown in both pictures. Most operations can be connected and applied as shown in the picture.

Contraction of the wrist

flexors • The motion of bending the wrist inward on this page is a posture resulting from contraction of the wrist flexors.

■ Fist raised posture

X

▲ Unnecessary form of figure

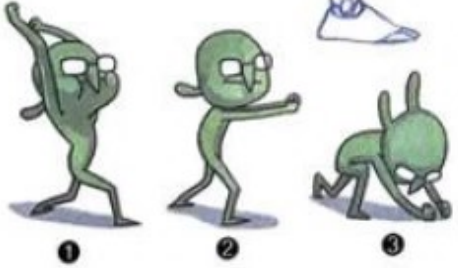
drawing. Because men's shoulder and chest muscles look prominent, they are often drawn by connecting the shoulders and chest as shown in the figure above. If you hold the shape in this way, an unnecessary shape is created, as if you are wearing armor, and it is far from the simple form of the figure drawing.

The armpits are one of the most complex surface muscles in the human body. If you exclude the latissimus dorsi muscle, which makes the armpit structure the most complex, you can see a more simplified structure, making it easier to understand.

When men speak, their neck is buried due to the thickness of the pectoralis major muscle. It is covered.

Why the armpit structure is complex

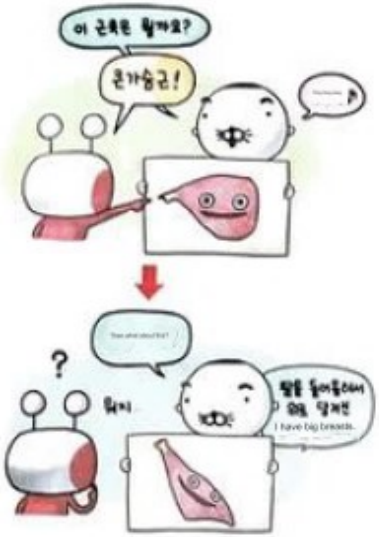
The armpit area is anatomically complicated? In the days of tree-climbing apes, the infraspinatus, teres major, and latissimus dorsi muscles attached to the armpits were mainly used to hang from trees with their arms for a long time, and these muscles played a role in strongly supporting the joint between the arms and the torso. Since the structure must be strong enough to support the weight of the body while having a wide range of motion, these characteristics remain even now that we do not climb trees.



❶ ❷ ❸

timing of action

Of these connected movements, how many are the impactful postures? Number 2, when the force is at its maximum, and Number 2, at the peak of the strike, feel the most dynamic. Number 2, which is in motion, lacks dynamism, so close-ups or speed line effects must be used to create impact.



Various appearances of big breasts

The shape of muscles that change depending on movement

You have to study to be able to express the flow that suits your posture.

In particular, the pectoralis major muscle is involved in a wide range of arm joints.

It is a muscle that undergoes a lot of deformation due to movement.

Natural arm angle When you raise your bent arm, the tilt of both arms is not 11, but a tilt where the hands are gathered inside the body is created.

The large flow of the latissimus dorsi If you look up at the body from below, you can observe the shape of the latissimus dorsi surrounding the body.

Foot position according to direction of movement

As shown in the picture above, when the direction of movement is applied from top to bottom, the center of gravity swings back and forth, so the position of the bee must be spread back and forth to maintain stable balance.

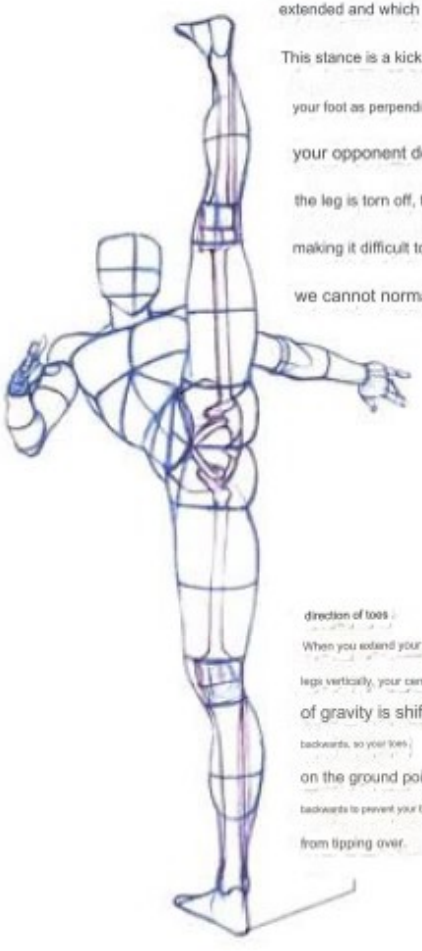
6 kick application posture

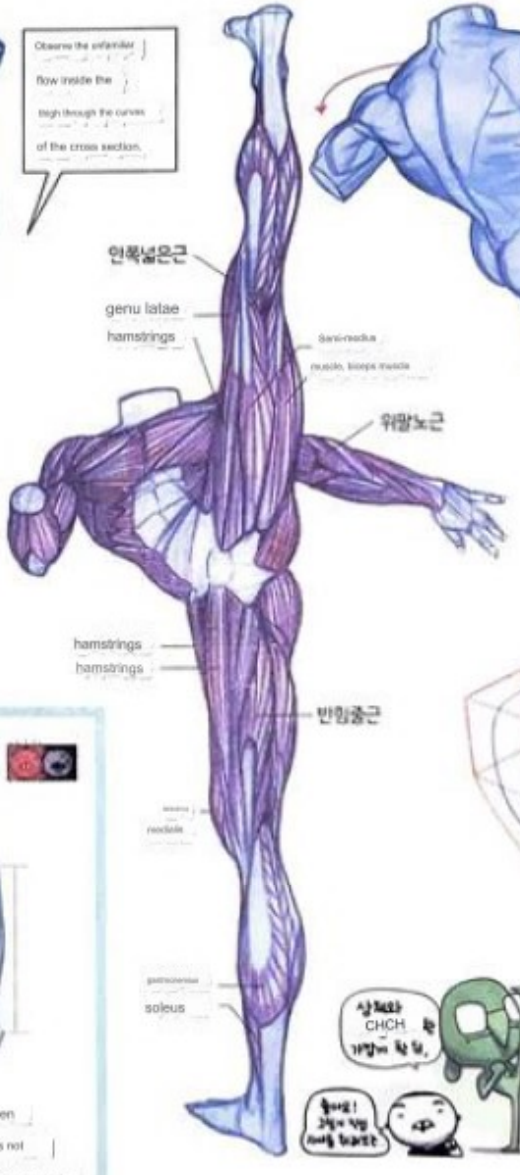
- Preparation for a foot slam

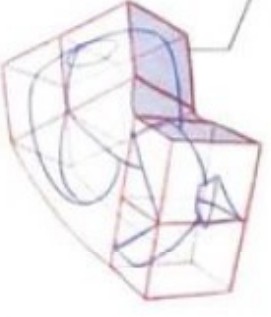
Why kicking poses are difficult to draw

The kicking technique varies depending on which direction the leg is extended and which part of the foot is used to strike.

This stance is a kicking technique in which you raise your foot as perpendicular to the floor as possible and slam your opponent down with your heel. When the leg is torn off, the inside of the groin is exposed, making it difficult to draw the blind spot area that we cannot normally see.







Area where the leg trapezius muscles

are exposed The trapezius muscles are actually spread

out, but the semitendinosus and biceps femoris

muscles cover them. The leg trapezius muscle, which

is obscured by the two muscles, is

visible only as much as the red area.

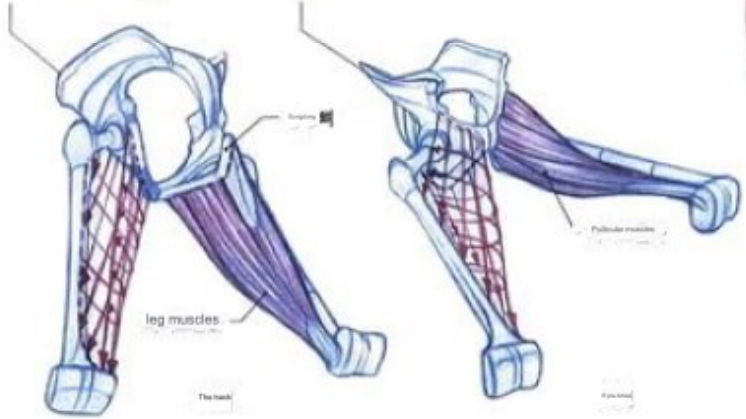
Three-dimensional structure of the leg

collection To understand the appearance of the leg collection muscles

surrounding the arch bone of the pelvis, you must connect the front

and back as shown in the picture below and look at the structure

three-dimensionally.



Bend your waist forward as much

as possible and bring your body and

legs into contact to complete

the down preparation position.

Structure of the inner thigh

The area painted in red is the

area where the leg trapezius muscles

are exposed, and based on this

area, the thigh can be divided into

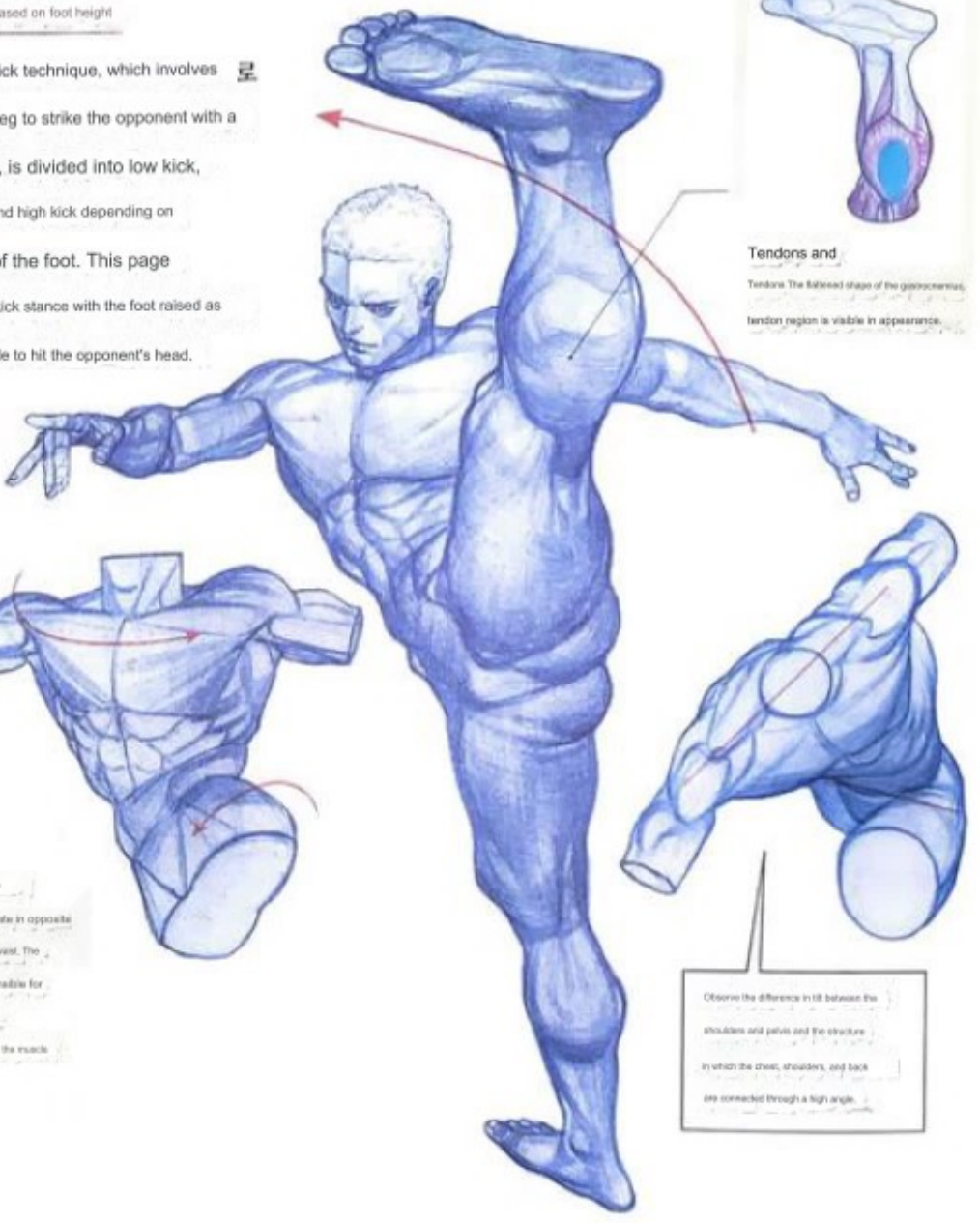
the front and back.

■Turning kick

This point stands out externally due to the anterior iliac spine and cephalic union of the pelvic bone.

Techniques based on foot height

The round kick technique, which involves 로 rotating the leg to strike the opponent with a kick or shin, is divided into low kick, middle kick, and high kick depending on the height of the foot. This page shows a high kick stance with the foot raised as high as possible to hit the opponent's head.



Twisted waist ▸

This is a picture to see the waist area hidden by the legs. The upper body and pelvis rotate in opposite directions, allowing you to observe the twisted waist. The external oblique muscle, which is responsible for rotating the torso, and the rectus abdominis muscle, which bends the waist, contract, making the muscle boundaries stand out.

Tendons and

Tendons The flattened shape of the gastrocnemius tendon region is visible in appearance.

Observe the difference in tilt between the shoulders and pelvis and the structure in which the chest, shoulders, and back are connected through a high angle.

draw step by step

If you draw the curves of each muscle without focusing on the larger flow, the flow of small units is often over-expressed, giving the impression that the bones are bent. Instead of looking at the small flow from the beginning, express the big flow with a cylinder and then describe the small flows within it!

Raise your upper body upward to balance your forward leg with your foot on the floor.

Lower body shaping.

The reason why the lower body feels more difficult than the upper body is because, unless you are drawing a superhero character, you don't have to draw a character that shows the lower body line, so you haven't studied enough. Also, in order to draw the legs that are longer and bulkier than the arms and put them together into a shape, it feels difficult because you have to look at the picture from a larger perspective. As shown in the picture on the right, if you view the arm as a cylinder and interpret the leg as a larger cylinder, the shortening phenomenon can be easily expressed.

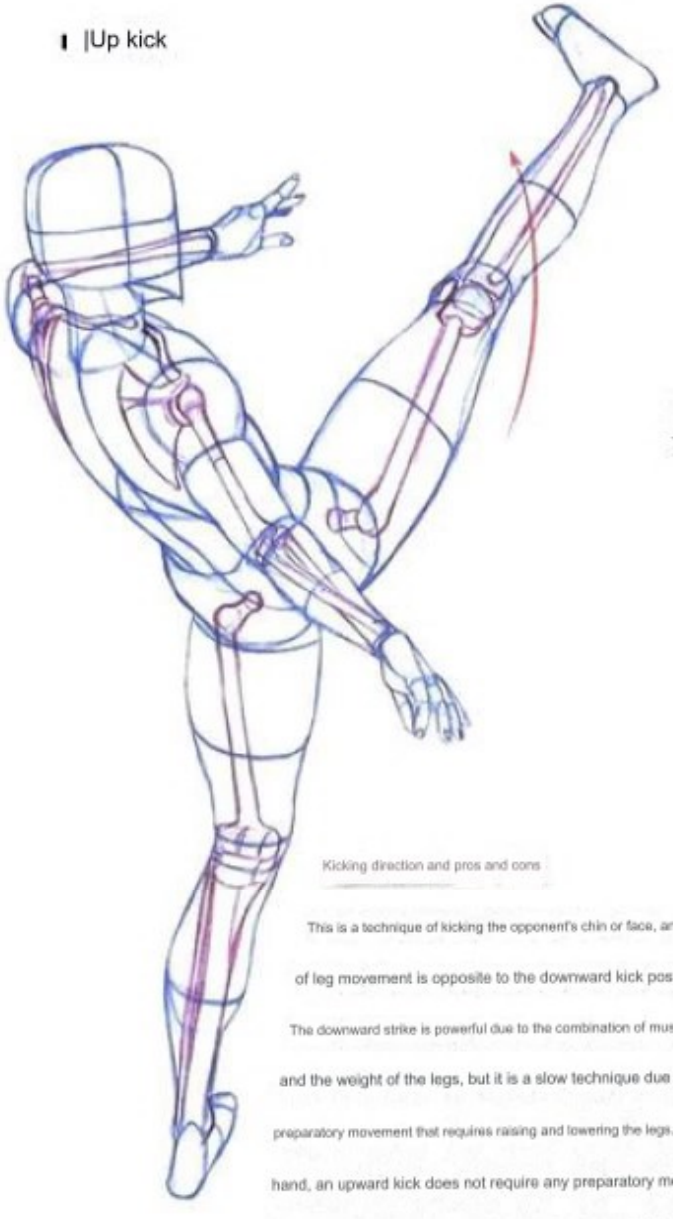
In the anatomy diagram of the back of the knee, you can see a hollow space behind the knee, but as this area is filled with fat, the hollow disappears.

sunken triangular area

Like this pose, if you spread your legs and apply force to bring them inwards, strength is applied to the hamstrings and trapezius muscles at the same time, creating a triangle-shaped sunken area.

The structure of the gastrocnemius forceps muscle appears to be simple on the right thigh when the inside of the leg is visible, but at the angle of the left thigh, it does not have a simple shape due to the overlap of other muscles.

|Up kick



Kicking direction and pros and cons

This is a technique of kicking the opponent's chin or face, and the direction of leg movement is opposite to the downward kick posture learned earlier. The downward strike is powerful due to the combination of muscle strength and the weight of the legs, but it is a slow technique due to the preparatory movement that requires raising and lowering the legs. On the other hand, an upward kick does not require any preparatory movements, so it can be attacked at high speed, but it is less powerful than a downward kick because it is performed using only the strength of the legs.

The skeleton, the blueprint of the human body ▲

In order to be able to creatively express the detailed structure of the clavicle visible over the shoulder, you must know the internal structure that is the basis of the external structure, rather than trying to draw the external form. That's the framework.

To help with body rotation, the direction of rotation of the arms and the direction of the lower body are reversed, so the limbs are crossed like a soccer shooting stance.

In the case of characters with a lot of muscle mass and low body fat, the direction of the contracted muscles is also visible in their appearance.

Tensor fascia femoralis

The tensor fascia latae is used to raise the leg in a raised kick position, so you can see it standing out on the outside.

gluteus medius

Tensor fascia of the thighbone

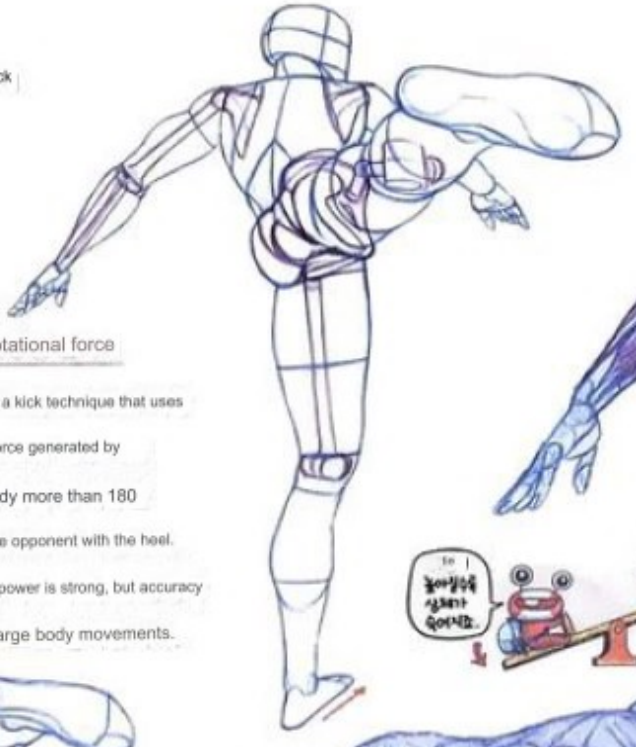
Uses of gluteus maximus

Shall we look again at the butt muscles we learned about in anatomy? The buttock muscles are divided into the tensor fascia latae, which lifts the leg forward, the gluteus medius, which lifts the leg to the side, and the gluteus maximus muscle, which lifts the leg backward. But why is the gluteus maximus muscle the largest among the butt muscles? This is because the gluteus maximus muscle is used for movements that require a lot of force, such as pushing off the ground when walking or running, or lifting the weight of the body upward to climb stairs.

Changes in the back depending on posture ▾

This is the general pose, looking down from the same eye level as the other pictures on this page. Compare the spinal flow and muscle deformation in a forward-bending or backward posture based on your general posture and look at the appearance of your back according to various movements.

■Turnaround kick



Kick using rotational force

The back kick is a kick technique that uses the centrifugal force generated by rotating the body more than 180 degrees to hit the opponent with the heel. The destructive power is strong, but accuracy is low due to large body movements.

•Push kick direction of the toe of the stepping foot

In this picture, the direction of the foot steps that are stepping on the ground is different from the picture above. The type of kick varies depending on the direction of the toes that are closing the ground. The direction of the stepping foot in this picture is a posture suitable for a push kick using the force of folding and straightening the legs. . When drawing a kick, you must pay attention to the direction of the foot as the technique varies depending on the direction of the kicking and stepping foot.

Turn around and kick

In the posture of

The RBI of the kicking foot

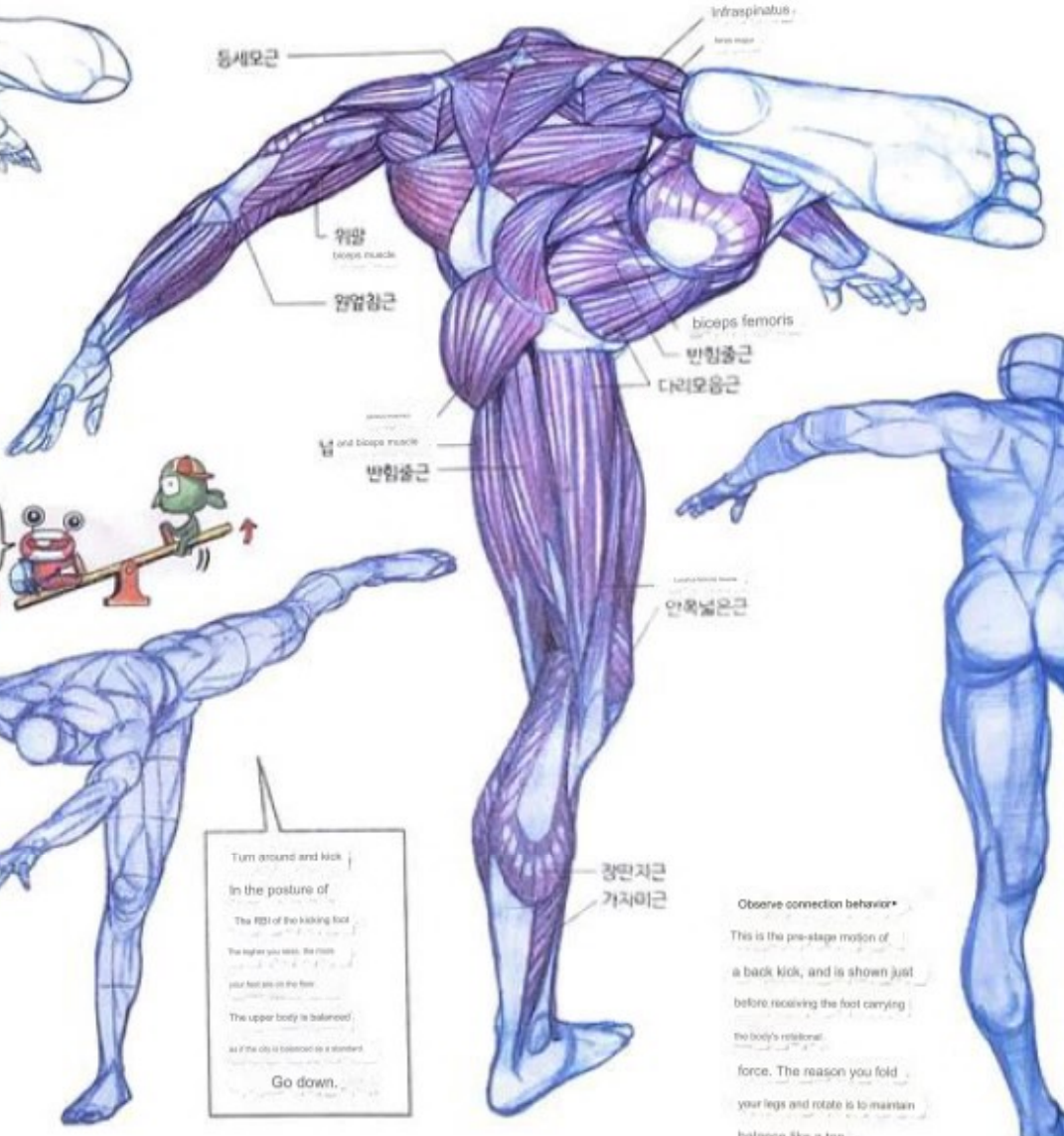
The higher you raise, the more

your foot are on the floor

The upper body is balanced

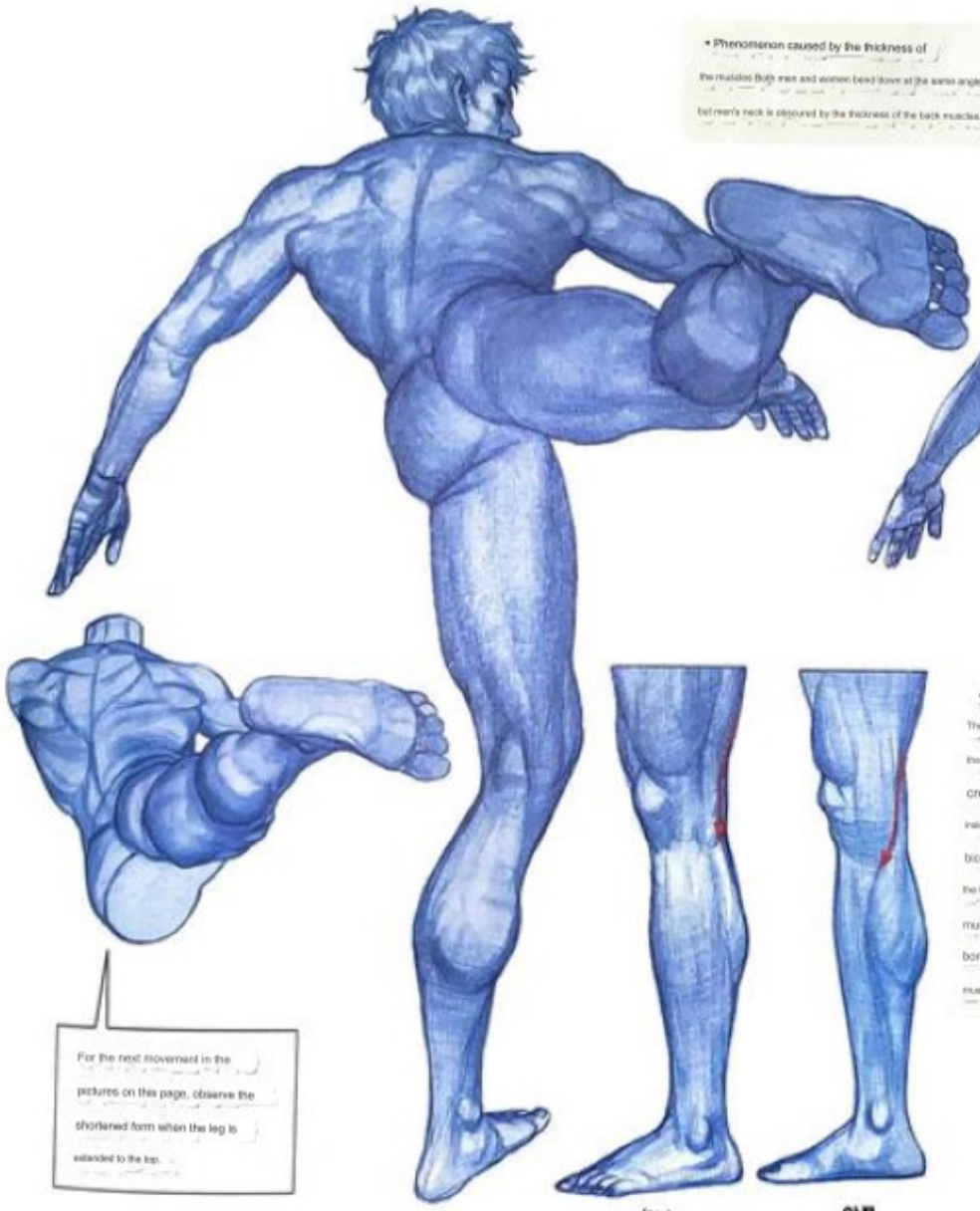
as if the city is balanced as a standard

Go down.



Observe connection behavior•

This is the pre-stage motion of a back kick, and is shown just before receiving the foot carrying the body's rotational force. The reason you fold your legs and rotate is to maintain balance like a top.



For the next movement in the pictures on this page, observe the shortened form when the leg is extended to the top.

• Phenomenon caused by the thickness of the muscles Both men and women bend down at the same angle, but man's neck is obscured by the thickness of the back muscles.

family

안쪽

• Knee family and internal flow

The biceps femoris creates a straight flow to the knee family, and the semitendinosus creates a curved flow to the inside of the knee. While the flow of the biceps femoris ends at the head of the fibula, the flow of the semitendinosus muscle continues with the muscle border of the gastrocnemius muscle, as shown in the picture.

The importance of gaze

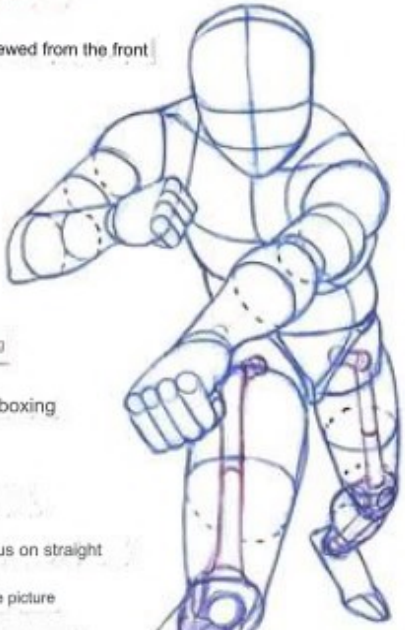
direction When performing a back kick, turn your head back to look at the target you are trying to hit. If the direction of the gaze is not looking at the hitting point, it will change into an unknown motion rather than a kicking posture.

Tendons of the semitendinosus and biceps femoris.

In female characters, the shape of the muscles is not clearly visible on the outside. The tendons of the semitendinosus and biceps femoris appear prominent. The reason why the tendons of the kicking leg are more clearly visible than the leg that is stepping on the ground is because the muscles of the back thigh are contracting.

7 Punch application posture

■ Straight posture viewed from the front



Basic punches in boxing

The most basic of boxing

The punch is " and

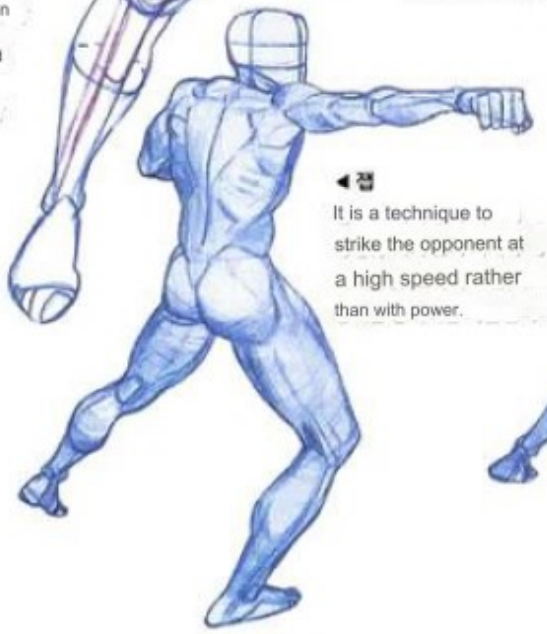
It's 'straight'.

This time, we will focus on straight posture. As shown in the picture on the right, the posture when the arm with the fist outstretched and the leg extended forward are opposite.

It's straight

do.

When filming an action scene, you can create a much more dynamic and realistic hyper-perspective screen by moving the camera directly closer to the actor rather than using a lens while the camera and actor are far away. When the size of the fist increases, as in this picture viewed through hyperperspective, it gives the feeling that the situation is happening right in front of your eyes.

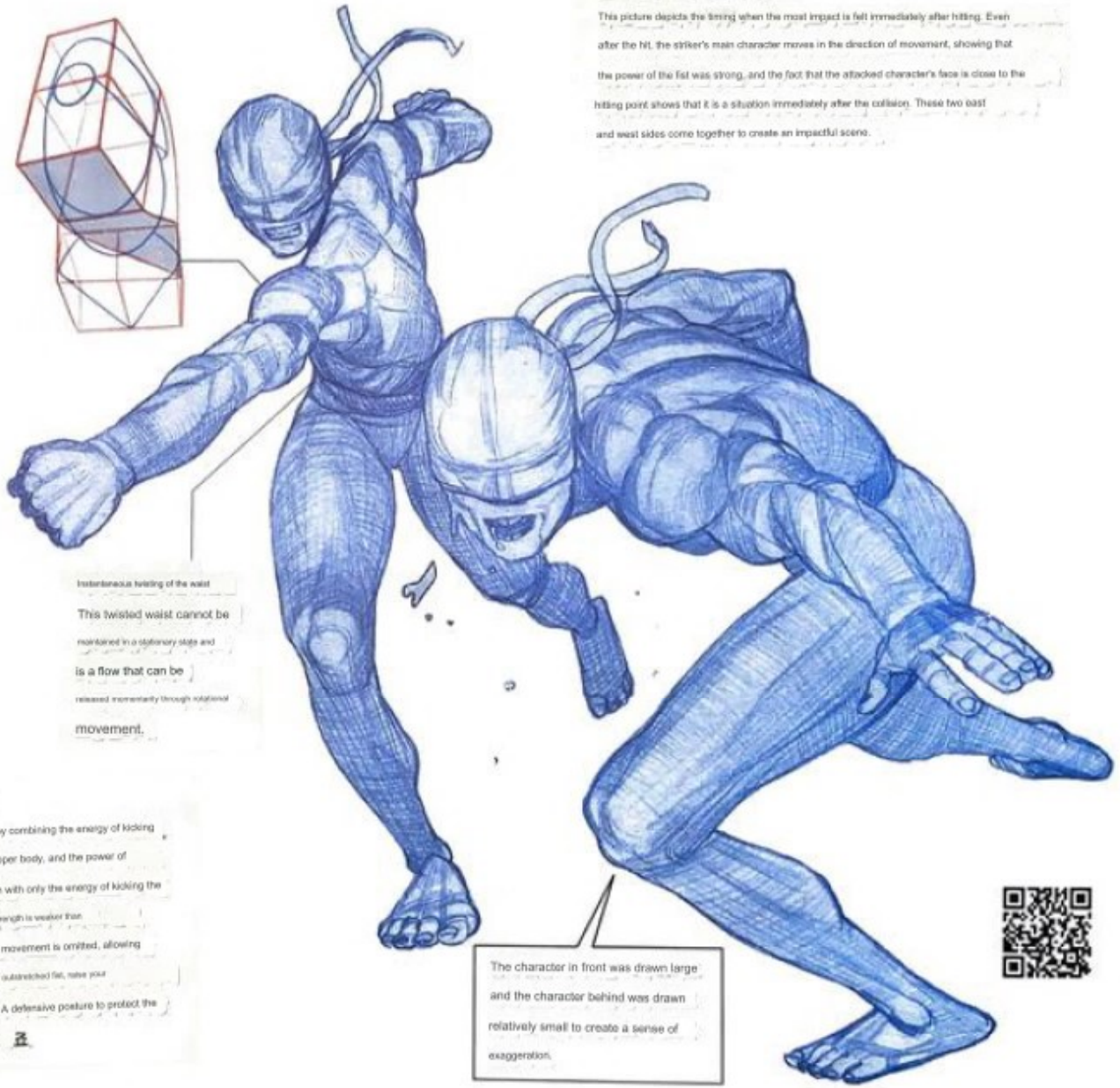


◀ 잽

It is a technique to strike the opponent at a high speed rather than with power.

◀ Straight

It is a technique that focuses on power rather than speed by increasing the power of the punch by twisting the upper and lower body from a straight posture to a side view.



Timing when impact is felt

This picture depicts the timing when the most impact is felt immediately after hitting. Even after the hit, the striker's main character moves in the direction of movement, showing that the power of the fist was strong, and the fact that the attacked character's face is close to the hitting point shows that it is a situation immediately after the collision. These two east and west sides come together to create an impactful scene.

Instantaneous twisting of the waist

This twisted waist cannot be maintained in a stationary state and is a flow that can be released momentarily through rotational movement.

The character in front was drawn large and the character behind was drawn relatively small to create a sense of exaggeration.

▲ Principle of posture in which force is transmitted through the fist

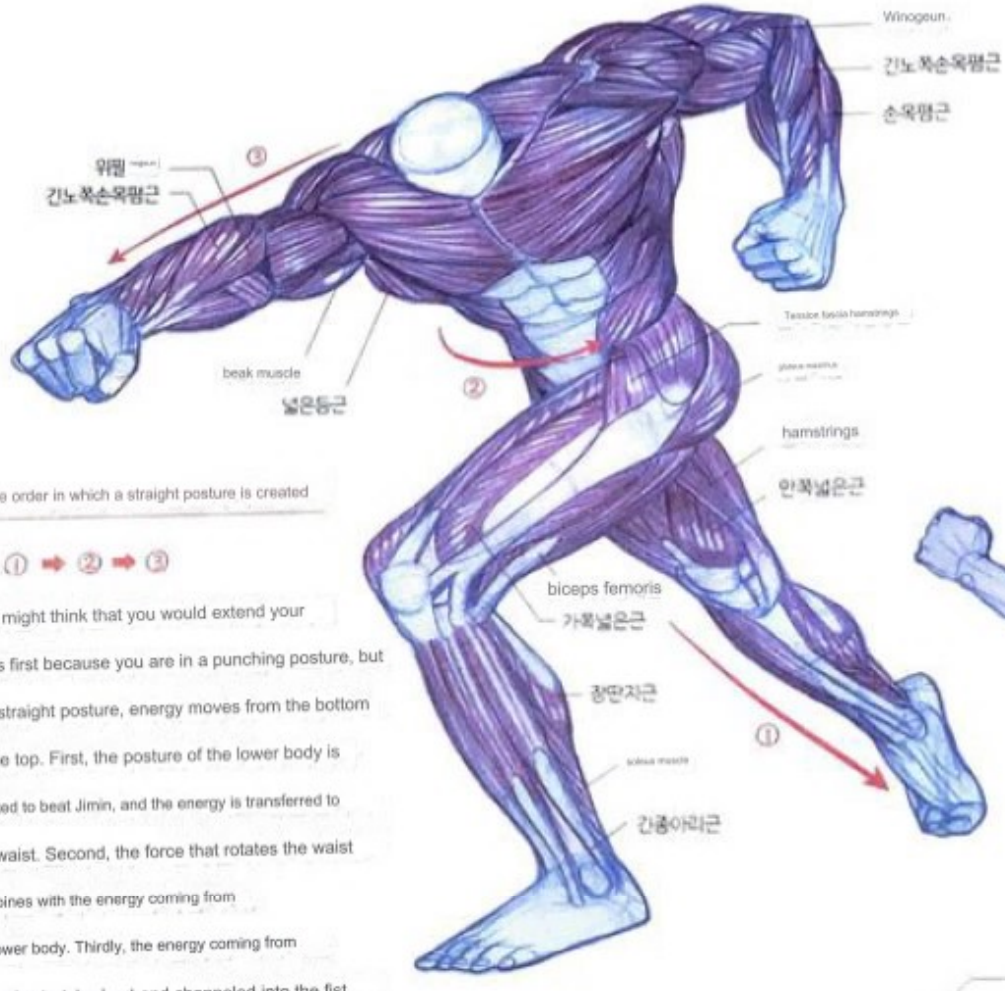
Straight is a technique that increases the power of a punch by combining the energy of kicking the ground with the foot, the rotational force of twisting the upper body, and the power of extending the arm. In the case of a chap, the punch is thrown with only the energy of kicking the ground with the foot and the power of extending the arm, so the punch strength is weaker than that of a straight punch. On the other hand, the body rotation movement is omitted, allowing you to attack the opponent at high speed. With the hand opposite to your outstretched fist, raise your fist close to your face to guard against the opponent's attack. A defensive posture to protect the brain, which is the most vulnerable part of the body to shock.

■ Straight posture viewed from the half side

boat straight posture

As I said before |
In the straight posture, the outstretched
arms and forward legs are crossed, |
causing the shoulders and pelvis to twist.

If the horse and legs stretched forward are the same and the shoulders
and pelvis are not crossed, the posture will be chop rather than straight.



The order in which a straight posture is created

① ➡ ② ➡ ③

You might think that you would extend your
arms first because you are in a punching posture, but
in a straight posture, energy moves from the bottom
to the top. First, the posture of the lower body is
created to beat Jimin, and the energy is transferred to
the waist. Second, the force that rotates the waist
combines with the energy coming from
the lower body. Thirdly, the energy coming from
below is stretched out and channeled into the fist.

trend of austerity

If you look at the straight posture from a high angle, you can see at a
glance how the energy of the lower body, which supports nature, is transmitted
to the main body. The point is that the positions of both feet and the
tips of the fists are in a straight line.

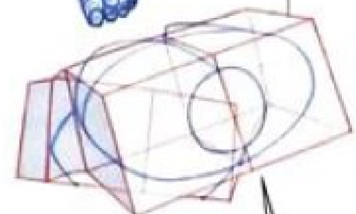
Angle where the jade is not visible>

In a position where the neck is hidden due to overlapping of the face, even a small change in the position of the face can cause the neck to become shorter or longer, so position the face based on the part where the neck starts from the torso.

There should be a wrinkle between the brachioradialis muscle and the radialis longus scapular muscle, and the two muscles should be expressed as being pushed against each other and protruding.

Understanding flow in the direction of muscles ▲

When looking at the flow of the arm from the inside, when the back of the hand is facing the sky, the direction of the muscles is straight, whereas when the palm is facing the sky, the muscles are twisted and have a curved flow. Understand the overall direction of the muscles based on the side view and change the flow depending on the viewing angle.



Check the torso box to see how much your torso and pelvis are distorted.

Let's understand through simple shapes the structure of the curve created by the body weight of the outer side blade when the foot touches the floor.

❶

❷

◀ Flow of straight posture seen from the side

• When the lower body falls back like a bus and the flow of the lower body and spine extends straight, the energy pushing the ground is transmitted to the tips of the fists. However, if you bend your back and create a undulating curve like in number 2, the energy coming from the lower body will be buffered and the power of the punch will be weakened.

■Punching a fist

training posture

This posture is a taekwondo jirjigi posture,

where both fists are stretched out alternately

while the feet are fixed and the shoulder

and pelvis tilt is not distorted.

Make a fist using only the force of

extending your arm, and place the

hand of the opposite arm at your waist.

Unlike the boxing posture where you

twist your body and place your

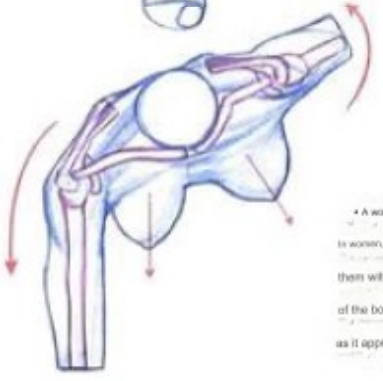
feet diagonally to strike your opponent,

the characteristic of

this posture is that you

only spread your feet

to the sides.



• A woman's shoulder movement seen from a straight perspective

In women, the gap between the skin and the bones is close, so you can clearly see the curves of the bones when you observe them with your intuition. The shoulder blade of the arm stretched forward is pulled along the arm, making the outline of the bone more prominent, and the shoulder of the opposite arm, which is pulled back, has a blurred outline as it approaches the spine. In women's breasts, the direction of the nipple spreads radially relative to the torso. I lose

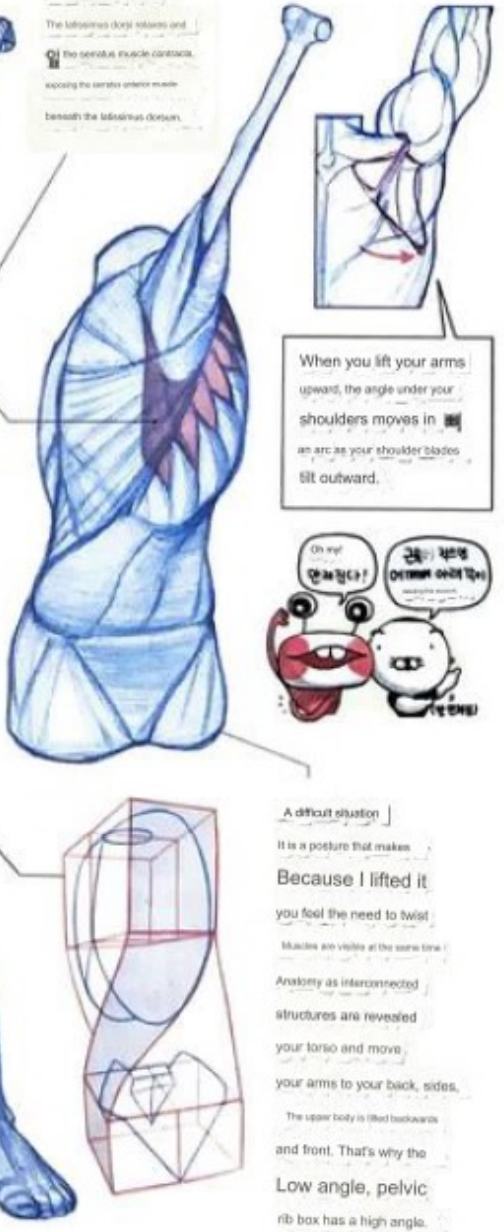
Angular silhouette of a woman •

A woman's silhouette is not only curved, but an angular outline is created in areas where the skin and bones come into close contact, as shown in numbers 0, 4, and 2.

■ Uppercut

Uppercut attack point

Lean your body back, twist your waist to the side, and extend your fists from bottom to top. It's a technique for striking the opponent's chin.



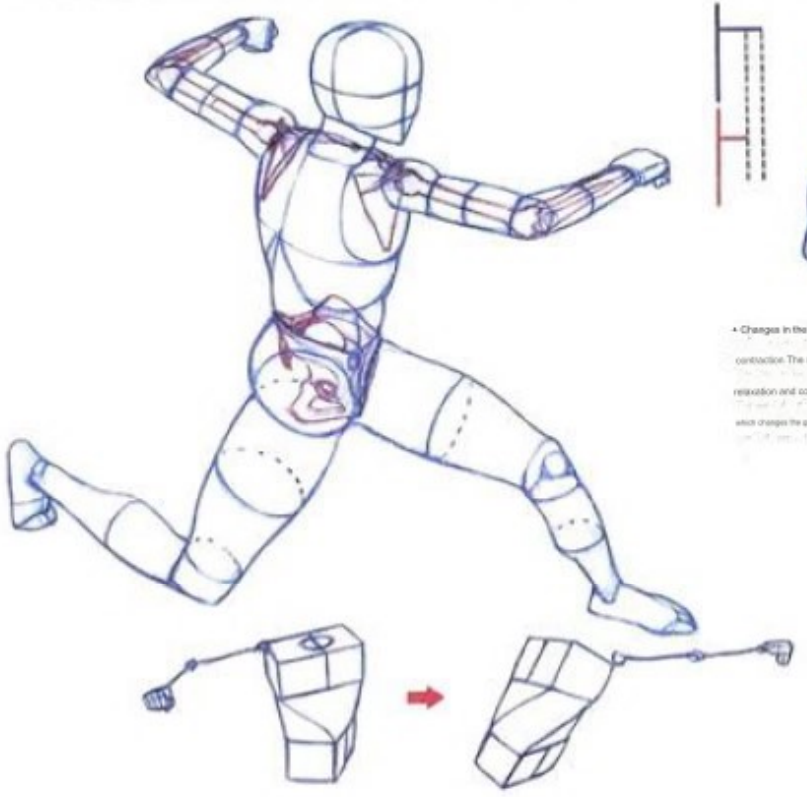
A difficult situation

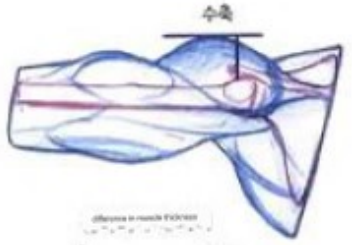
It is a posture that makes
Because I lifted it
you feel the need to twist
Muscles are visible at the same time
Anatomy as interconnected
structures are revealed
your torso and move
your arms to your back, sides,
The upper body is tilted backwards
and front. That's why the
Low angle, pelvic
rib box has a high angle.

▪ Continuous punch

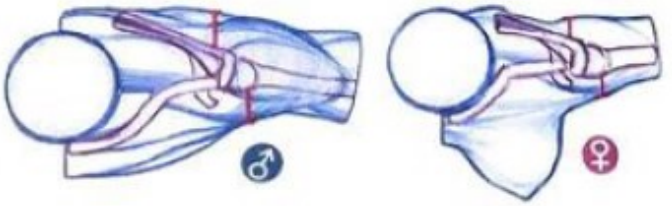
punches delivered in succession

In actual fighting situations, most attacks do not end with a single blow, but rather involve consecutive attacks. The person on this page is in a posture of punching continuously.



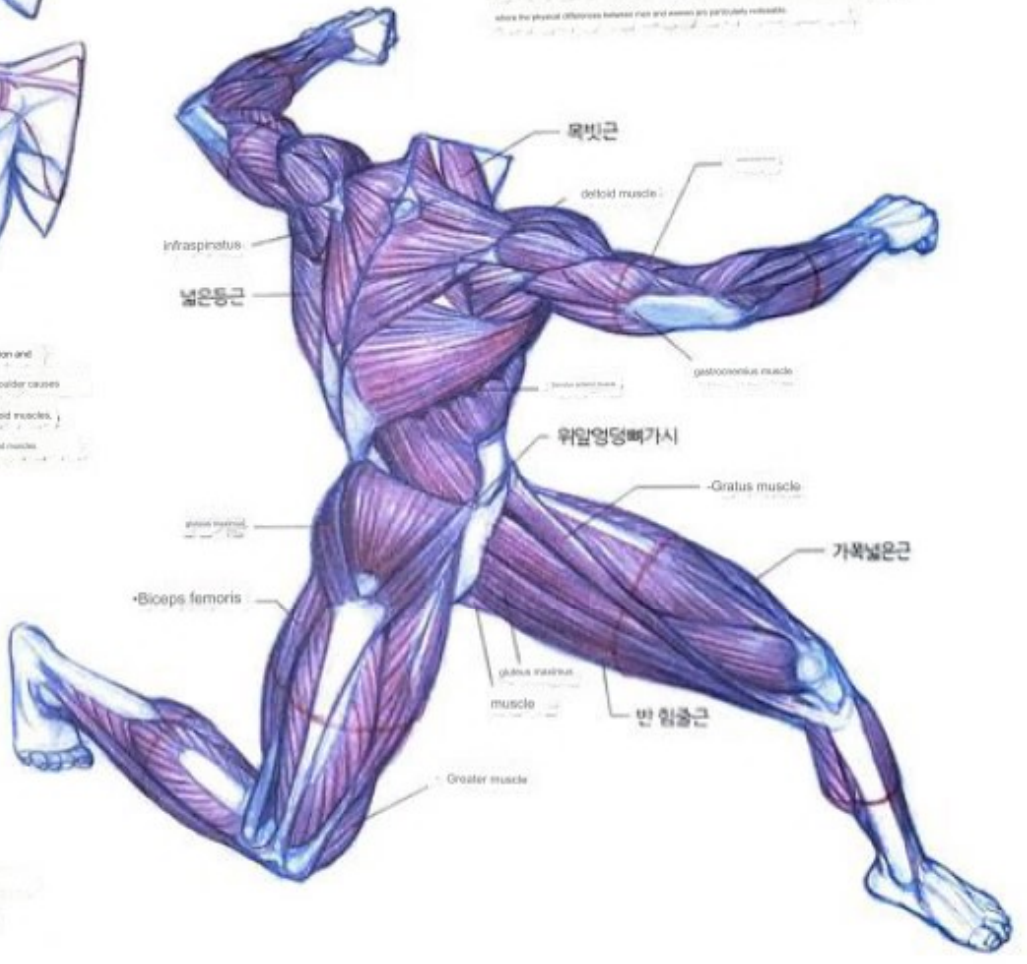


• Changes in the thickness of relaxation and contraction The movement of the shoulder causes relaxation and contraction of the deltoid muscles, which changes the gap between the bones and muscles.



Differences in thickness between men and women's

shoulders • Compare in the picture the thickness of the shoulders and the gap between bones and flesh, where the physical differences between men and women are particularly noticeable.



Energy generated by rotation of the torso •

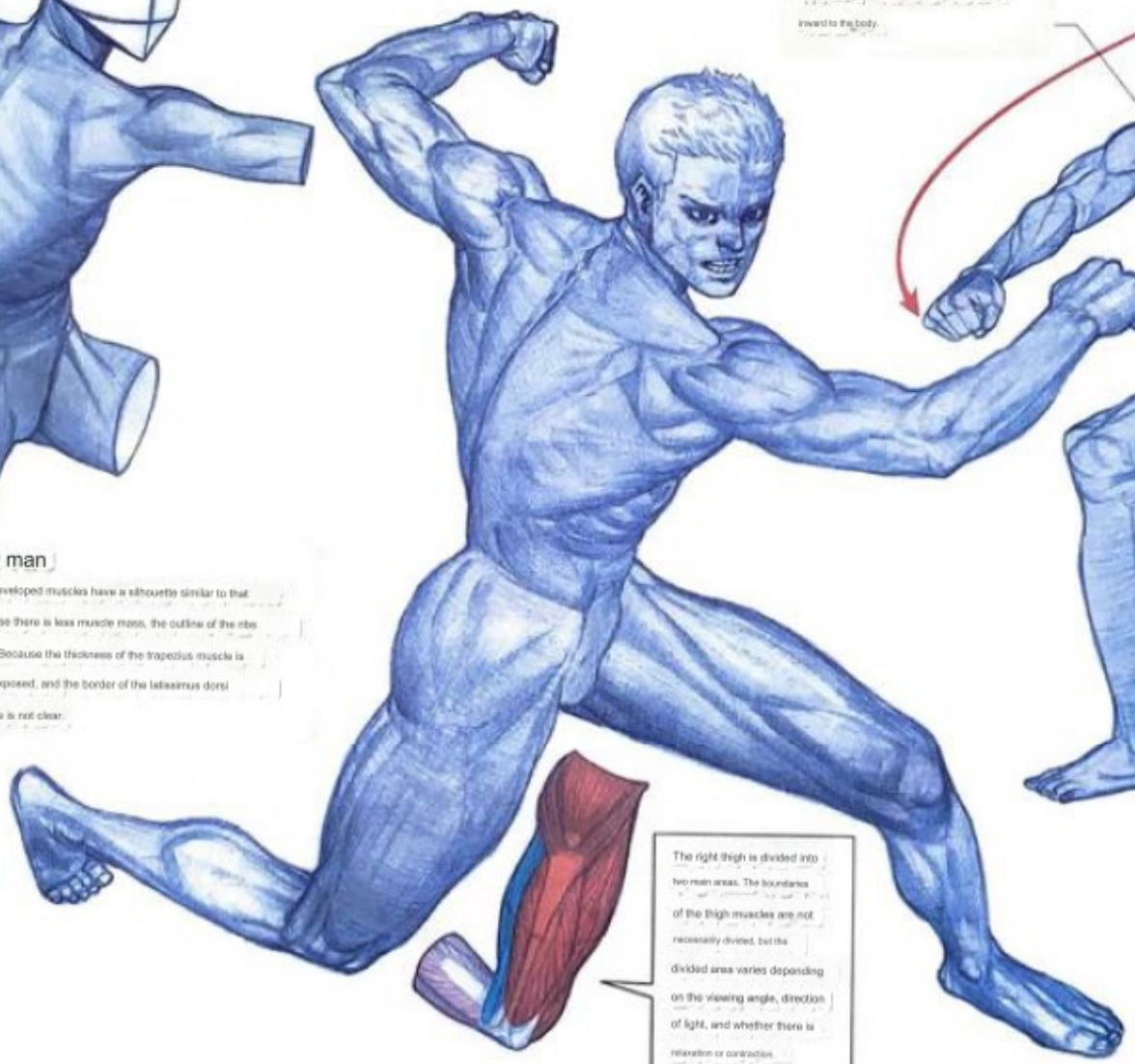
Twist your upper body back as much as possible to lengthen the rotating motion line to increase the energy in your fists. Not only when striking, but also when throwing something or swinging a tool, the arm energy and the rotational kinetic energy of the upper body are combined to produce strong force.

▲ Skinny man

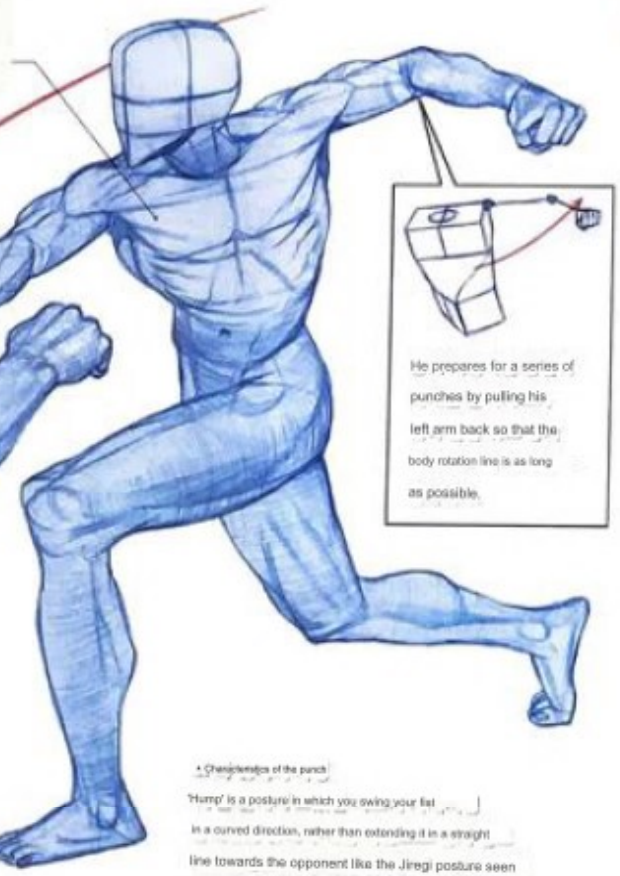
Men with underdeveloped muscles have a silhouette similar to that of women. Because there is less muscle mass, the outline of the ribs creates contrast. Because the thickness of the trapezius muscle is low, the neck is exposed, and the border of the latissimus dorsi muscle on the side is not clear.

Contraction of the pectoralis muscle

The hump punch position uses the pectoralis major muscle because the arm swings inward to the body.



The right thigh is divided into two main areas. The boundaries of the thigh muscles are not necessarily divided, but the divided area varies depending on the viewing angle, direction of light, and whether there is relaxation or contraction.



He prepares for a series of punches by pulling his left arm back so that the body rotation line is as long as possible.

▲ Characteristics of the punch

'Hump' is a posture in which you swing your fist in a curved direction, rather than extending it in a straight line towards the opponent like the Jiregi posture seen earlier. The power is stronger than that of straight fists, but it is easier for the opponent to defend against.

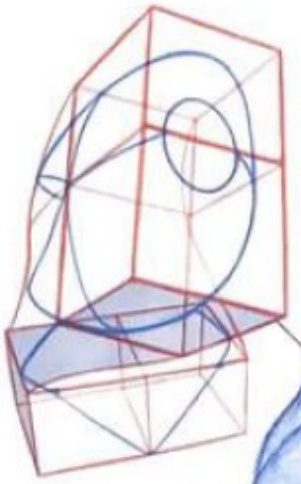
■ Punch in the air

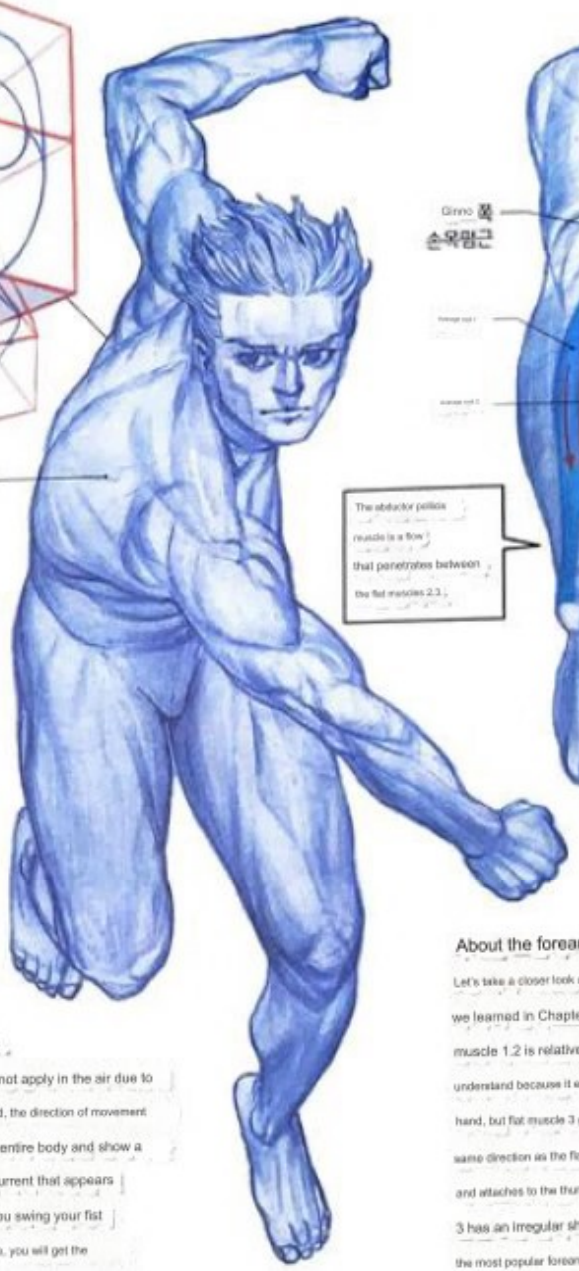
direction of punch

A superhero character who can levitate swinging a punch downward in the air

It's posture.

Relaxation of back





The abductor pollicis muscle is a flow that penetrates between the flat muscles 2,3.

Direction of movement in the air ▲

Center of gravity theory does not apply in the air due to lag and lack of foot contact. Instead, the direction of movement must influence the flow of the entire body and show a unified direction. It's like the current that appears when swimming in water. If you swing your fist in the water as shown in the picture, you will get the same position.

About the forearm flow▲

Let's take a closer look at the wrist flat muscles we learned in Chapter 3. The flow of flat muscle 1,2 is relatively easy to understand because it extends toward the back of the hand, but flat muscle 3 goes down in the same direction as the flat carpi longus muscle and attaches to the thumb side of the wrist. Flat muscle 3 has an irregular shape, so it is the most popular forearm muscle. These are the muscles you need to pay attention to.

In men, the iliac ridge

Based on the length of the lower body

Ash, but women have ribs

From the tip to the lower body

I was recognized and my height increased.

Even if they are the same, women's

Your legs look longer.

An optical illusion

On the left page, both knees appear to be in the same position, but if you look at them from a different angle, you can see that the positions of both knees are different.

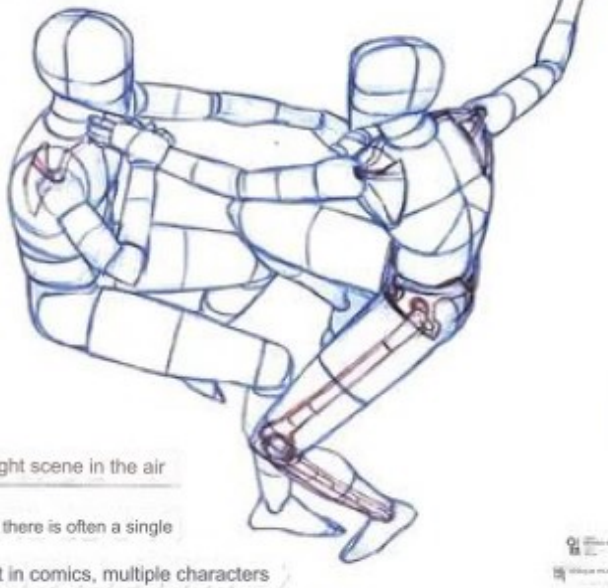
• Changes resulting from inner thigh movement

When the knee is bent, the horizontal length of the knee indicated by the arrow in the picture becomes longer than when the knee is straight.

•Apply Dongsae

I tried to compose a different action scene by taking advantage of the flow of posture on the left page. The space was changed from the air to the ground, and a hitting target was added to direct the attacking character's gaze. By changing just a few elements like this, a new action scene can be created, allowing a variety of productions to be performed in one pose. By applying movement like this, you can understand natural movements.

■ Fighting between characters

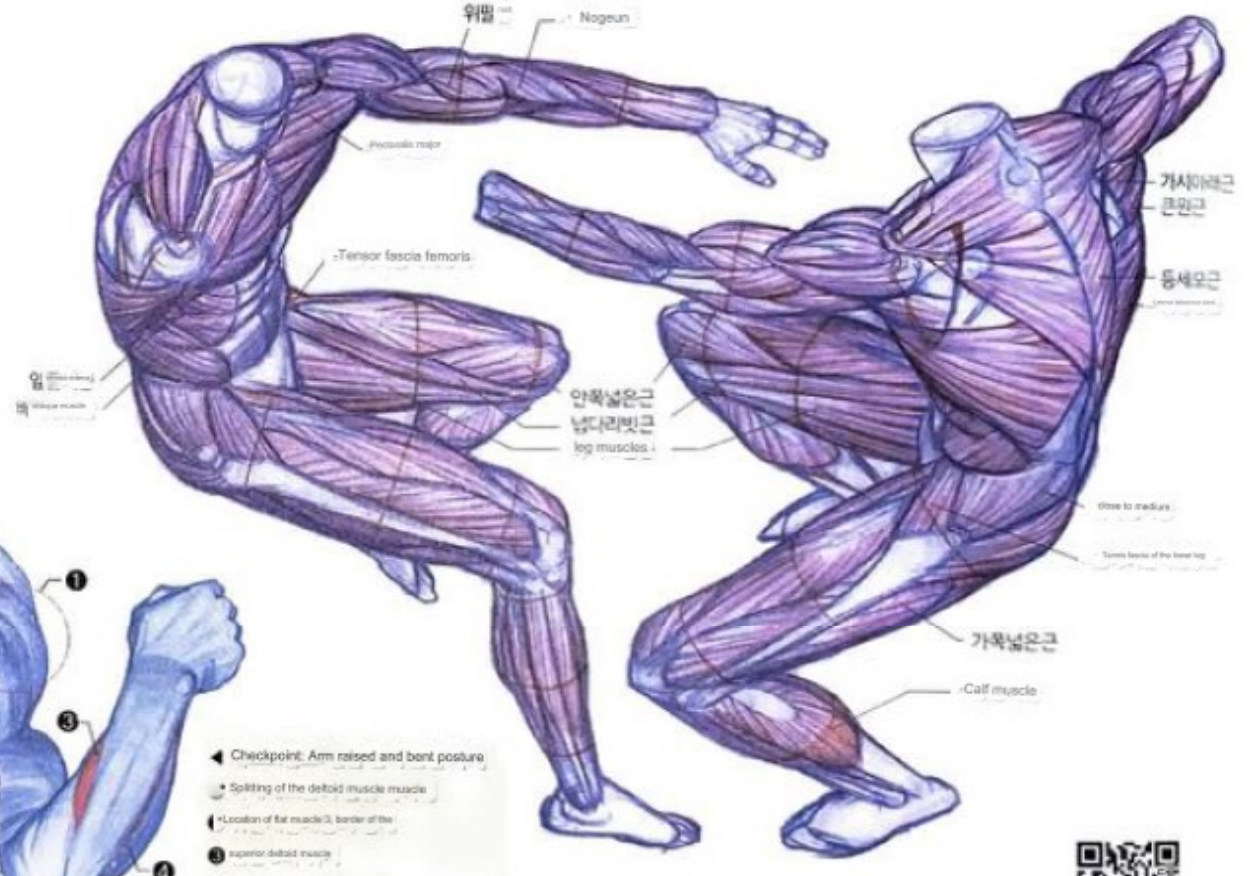


Drawing a fight scene in the air

In illustrations, there is often a single character, but in comics, multiple characters usually appear in one space. If it took an hour to draw one character, then if you draw two characters in the same space, you will need more time, not twice the time it took to draw one character. This is because the size and viewpoint of the person in the same space must be calculated. Additionally, when characters come into contact with each other, more time is added due to the spacing between characters. In the picture on this page, the characters are floating in the air, so there is no need to calculate the viewpoint, but it is difficult because the characters are touching each other.

◀ Checkpoint: Arms out to the side

1. The flow of the abductor pollicis muscle/flat muscle digging into the space between the flat muscle 2,3
2. Tendon area of the quadriceps brachii
3. Area not covered by the deltoid muscle when viewed from behind



◀ Checkpoint: Arm raised and bent posture

- Splitting of the deltoid muscle muscle
- Location of flat muscle 3, border of the
3. superior deltoid muscle
- Carpal flat muscles and wrist flexors divided based on the ulna

Person on the right ▸

As the distance between the hitting point and the fist increases, the energy that can be put into the fist when swinging the arm increases, creating a threatening posture with the angle of the arm wide open as shown in the picture. It also shows that the upper body is tilted in the direction of the attack, subduing the opponent with force. In terms of composition, the size of the attacking character occupies a larger space than the opponent, giving a feeling of dominance.

This posture emphasizes the broad back and muscles that highlight masculinity, so the impact appears somewhat weaker on a female figure in the same pose.

Person on the left ▸

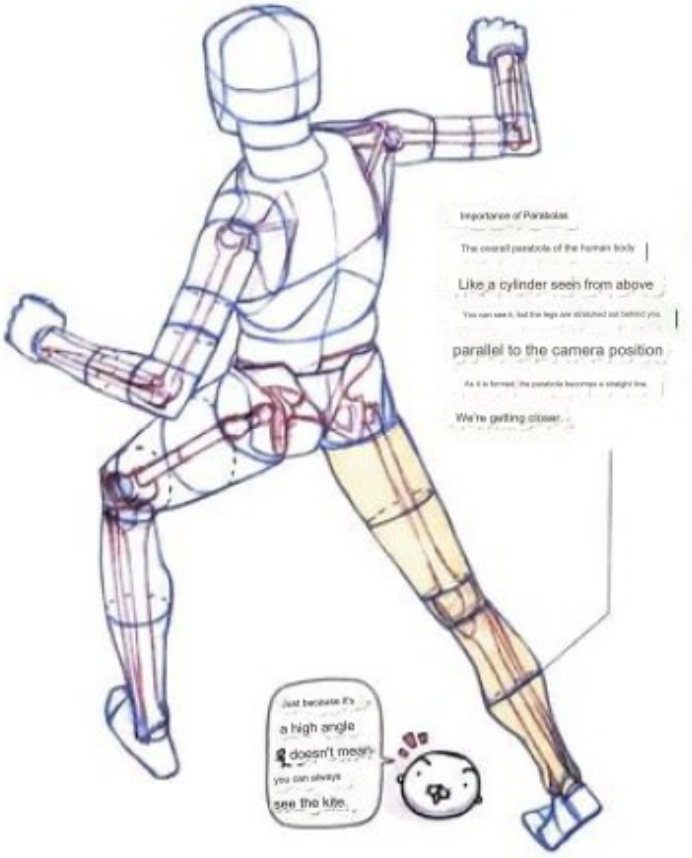
You can see that the center of gravity is tilted backwards and the balance is broken, showing that you are being pushed back in the fight. The withdrawn arm and leg posture also gives a defensive feeling. Not only in terms of posture but also in terms of composition, the side angle of the character makes it look smaller, creating a feeling of constriction. Through this information, we can see that the fight between the two characters is not equal, but that the character on the left is inferior.

You can observe the position of the shoulder blade and the relaxation and contraction of the trapezius muscle according to the movement of the arm. The shoulder blade of the right arm pulled back is brought together towards the spine, while the shoulder blade of the left arm extended forward moves away from the spine.

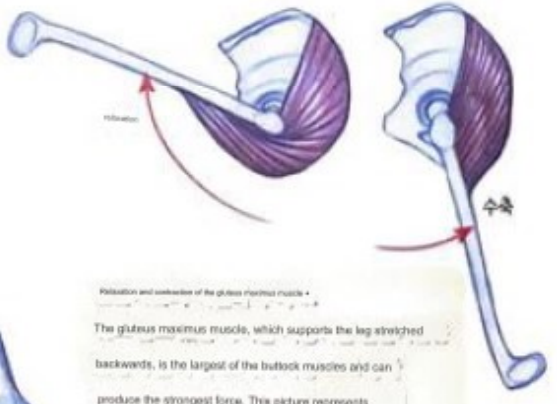
■ The middle stance of a hump punch.

Characteristics of the middle posture of extending the fist

The posture on this page can be thought of as the intermediate posture of extending the punch, while rotating the waist forward after twisting backwards for a hook punch attack. Almost identical shoulder and pelvic tilts indicate that the body is in a state of rotation. Since the angle is at the back of the character, you can clearly feel the force of the leg on the side where the fist is extended, kicking the ground.



Clear flow seen with line drawings>
You can see the flow more clearly revealed when the curves of the human body are expressed with lines rather than light and dark. Lines are a simplified expression of light and dark, so as your understanding of Yeongam increases, the sense of depth increases.



Relaxation and contraction of the gluteus maximus muscle ▲
The gluteus maximus muscle, which supports the leg stretched backwards, is the largest of the buttock muscles and can produce the strongest force. This picture represents the maximum range of relaxation and contraction of the gluteus maximus muscle.

Contraction of back muscles As both shoulders are pushed back hard, the trapezius, infraspinatus, teres major, and latissimus dorsi muscles are all contracting.

The hook punch is a technique in which the fist draws a trajectory and attacks the opponent's side, so it can be seen that the position of the attacking player is in the trajectory.

Area where the sole touches the ground The sole of the left leg is in complete contact with the ground to stably support the body weight, and the right foot, which is pushing the body forward and kicking the floor, is in a tiptoe position.

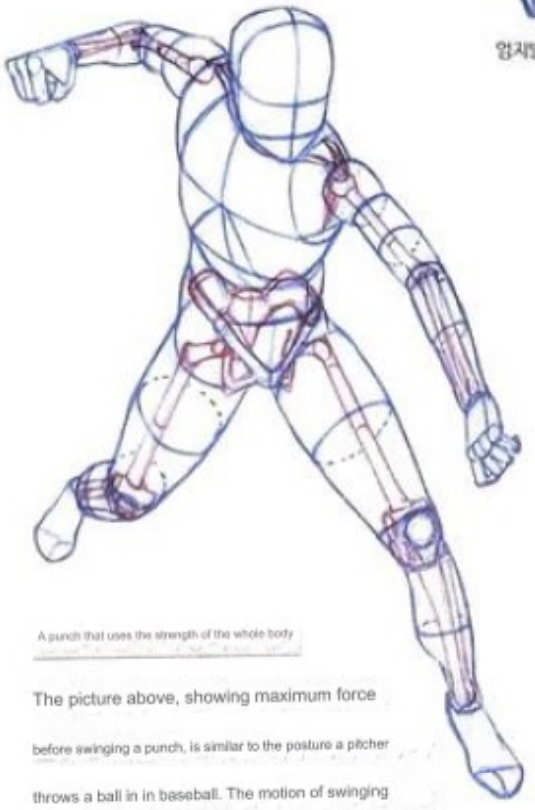
The hip line of men and women disappears on legs stretched forward and a hip line appears on legs stretched backwards. In men, the fine flow of muscles is visible on the buttocks of the legs stretched forward, but in women, no wrinkles appear.

▲ How to draw various experiences

You may not feel its importance because the skeleton is not visible in the finished picture, but you must draw the skeleton first and then add the muscles to be able to express the detailed structure as shown in the picture above. You must draw the position of the skeleton first before the outline flow, so that you can apply and draw various flows of various body types or men and women.

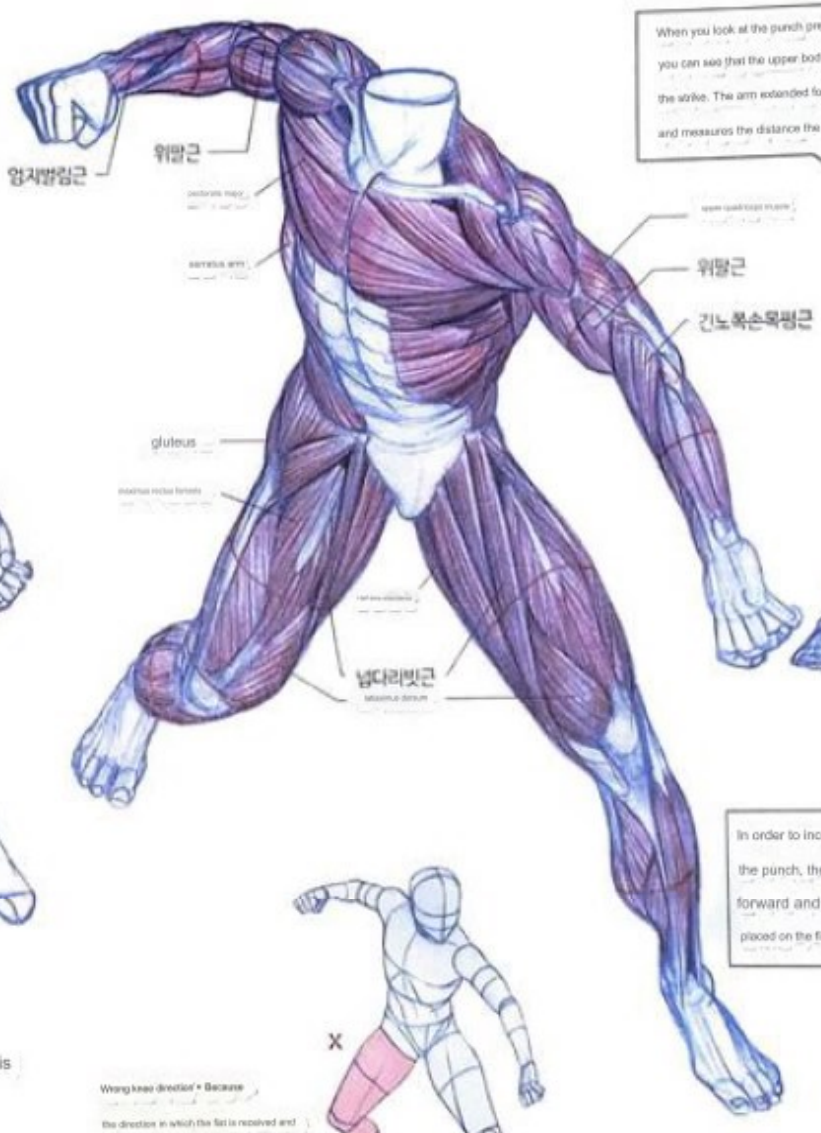
Even if you are thin or fat, your bones are the same!

■ straight ready posture



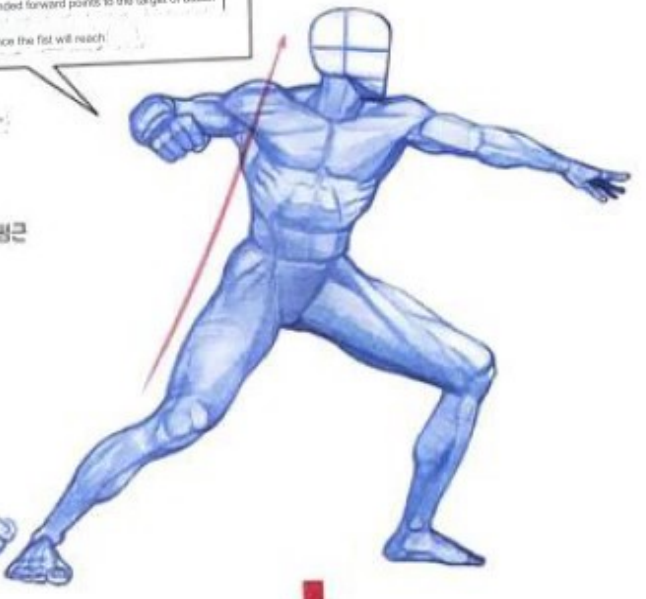
A punch that uses the strength of the whole body

The picture above, showing maximum force before swinging a punch, is similar to the posture a pitcher throws a ball in in baseball. The motion of swinging a punch begins with the lower body pushing off the floor and combines with the rotational force of the waist. Both energies are transferred to the arms, where all the energy is concentrated at the tips of the fists. To perform this movement, you need to be in a ready position by slightly bending both knees, twisting your upper body back as much as possible, and bending your arms.

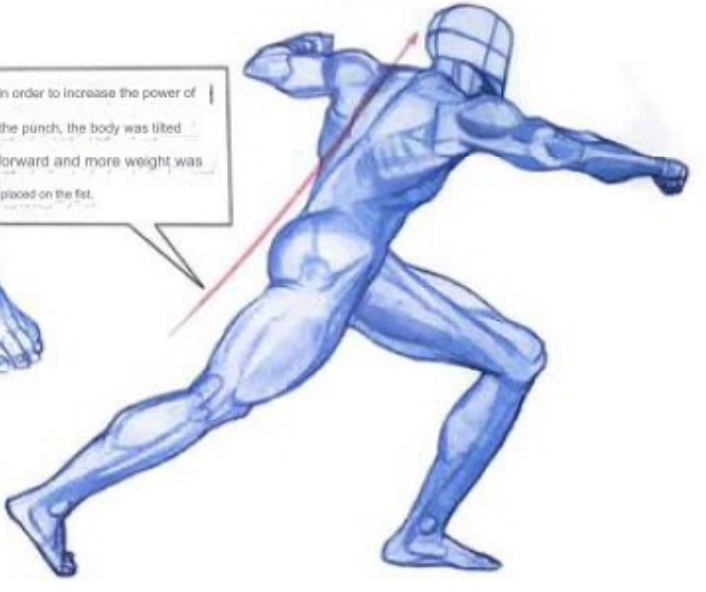


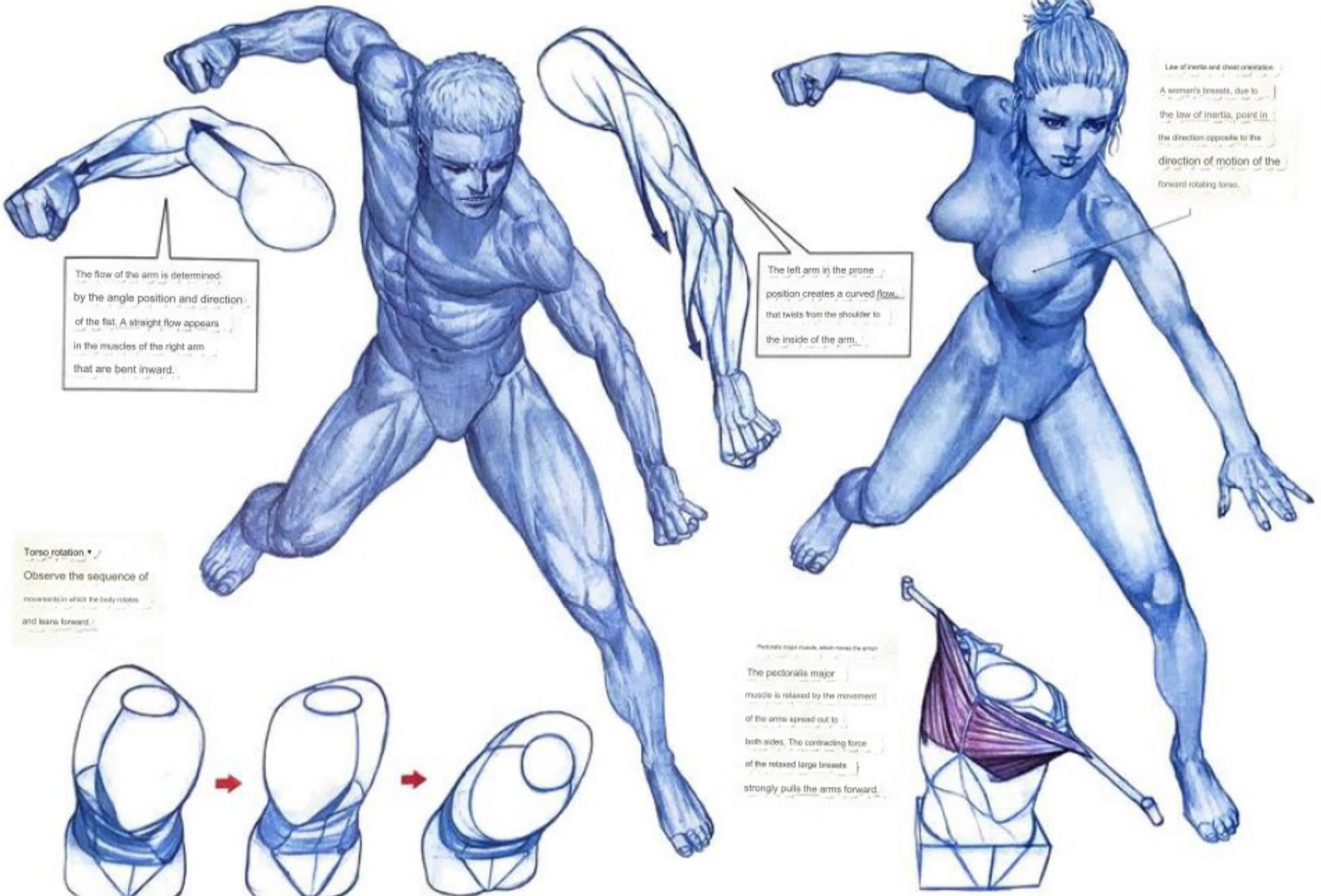
Wrong knee direction = Because the direction in which the fist is received and the direction in which the right knee is bent are different, the force that pushes Ayeon away is not applied to the punch.

When you look at the punch preparation stance from the side, you can see that the upper body is tilted in the direction of the strike. The arm extended forward points to the target of attack and measures the distance the fist will reach.



In order to increase the power of the punch, the body was tilted forward and more weight was placed on the fist.

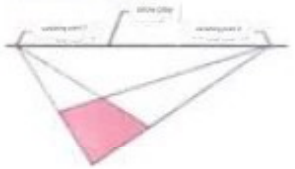



The flow of the arm is determined by the angle position and direction of the fist. A straight flow appears in the muscles of the right arm that are bent inward.
The left arm in the prone position creates a curved flow that twists from the shoulder to the inside of the arm.
Law of inertia and chest orientation
A woman's breasts, due to the law of inertia, point in the direction opposite to the direction of motion of the forward rotating torso.
Torso rotation
Observe the sequence of movements in which the body rotates and leans forward.
The pectoralis major muscle is relaxed by the movement of the arms spread out to both sides. The contracting force of the relaxed large breasts strongly pulls the arms forward.

The importance of space

If you want to draw people in the same space, you must set the eye level and create a space before drawing the people. Drawing a space to match the character without drawing the space first is like drawing a face first by drawing the eyes without considering the overall proportions of the face. A picture must be drawn starting from a large unit so that the composition and proportions can be calculated by looking at the whole picture.

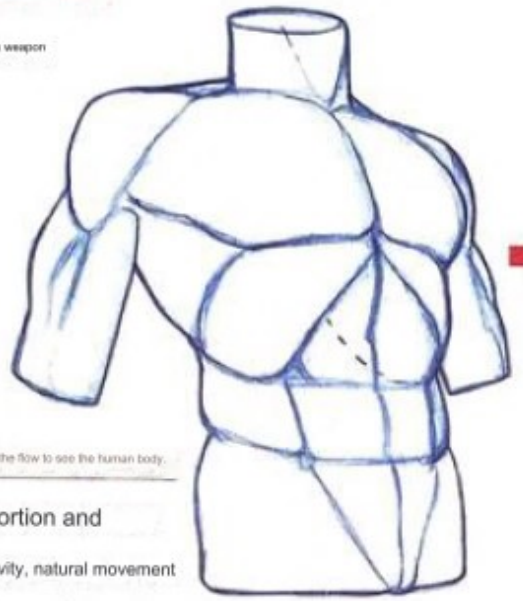
These characters are fighting each other with equal force, unlike the fighting stance of the previous characters. However, it can be expected that the person below, who is in the middle of swinging his fist, will punch the opponent at a faster rate than the person above, whose fist is tilted back.



Simple space setup

You may think that drawing space is a difficult and complicated task, but space can be created with just one rectangular surface.

· Position holding a weapon



A picture that gives a sense of depth The easiest way to give a sense of depth to the human body is to make the flow of the skeleton visible. Among them, the lower line of the ribs is a representative example.

You need to know the flow to see the human body.

Proportion and

Center of gravity, natural movement

After checking, focus on the large muscles.

Draw the flow with simple lines. One

Detailed muscles from the beginning

Rather than focusing on form

It's about simplifying the big flow by tying it up.

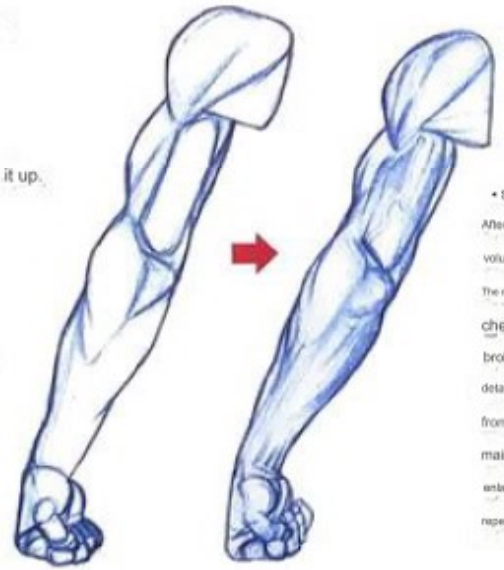
The best way to practice example is croquis, which

Students practice croquis

I used to ask how long it would take to do this

do. Painting is a combination of theory and sense.

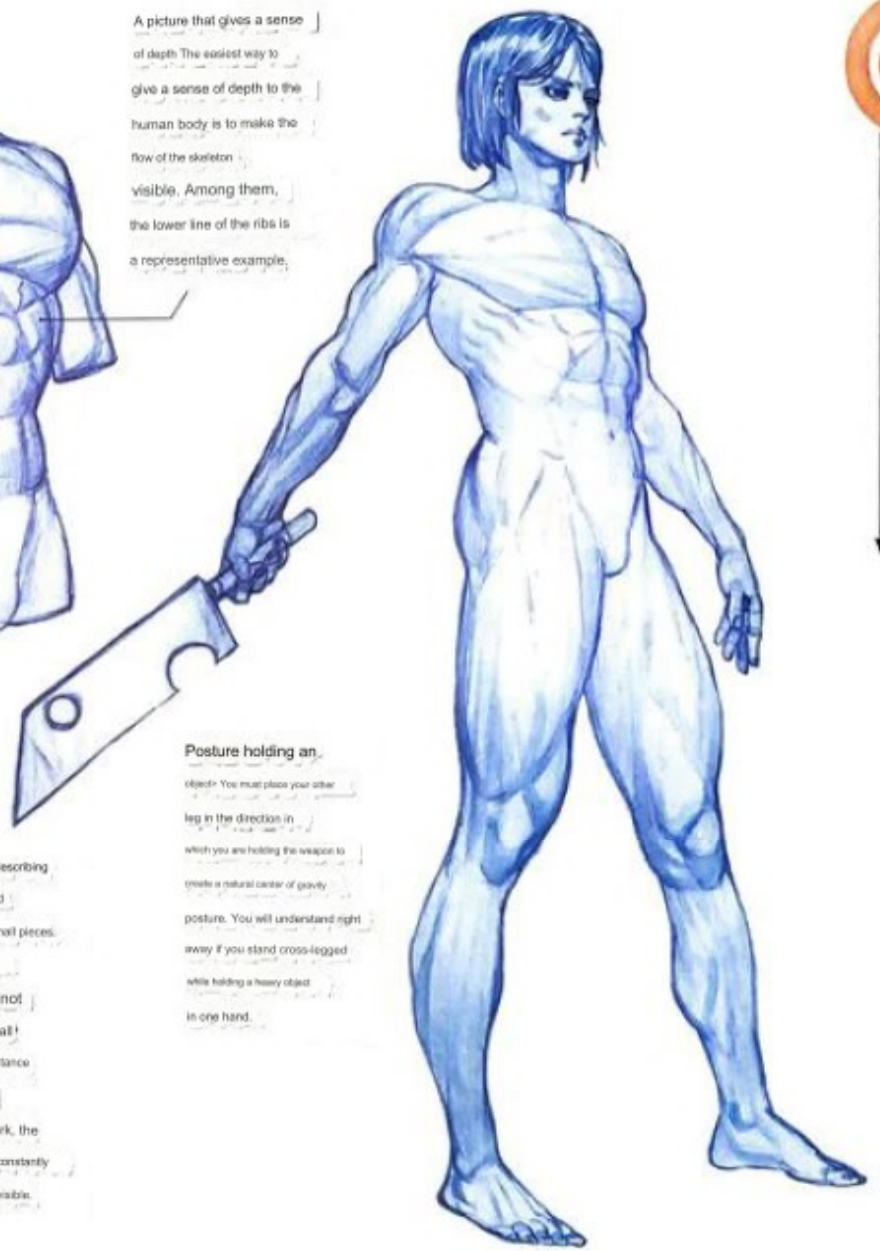
involves a lot of combinations, so endless practice is needed to maintain the sense.



• Situations to keep in mind when describing

After stably expressing proportion and volume, the surface is divided into small pieces.

The most important thing is to continuously check that the larger flow is not broken even while depicting small details. In manual work, the visual distance from the picture must always be maintained, and in computer work, the enlargement and reduction must be constantly repeated so that the entire picture is visible.



Posture holding an object> You must place your other leg in the direction in which you are holding the weapon to create a natural center of gravity. posture. You will understand right away if you stand cross-legged while holding a heavy object in one hand.

■ The posture of removing a sword from its sheath.

cross-legged posture

If you stand with your weight evenly distributed on both legs, your legs will continue to feel fatigued. So, when you stand, you usually rest on your opposite leg. When you stand on your opposite leg, the pelvis of the leg on which the weight is placed rises, and as a reaction, the shoulder on the same side goes down to balance it. In addition to inclination, the direction of your toes is also an important point. Depending on the direction of the toes, the cross-legged posture is divided into several types. Which of the following pictures shows the natural cross-legged posture? Let's take a look at each one.

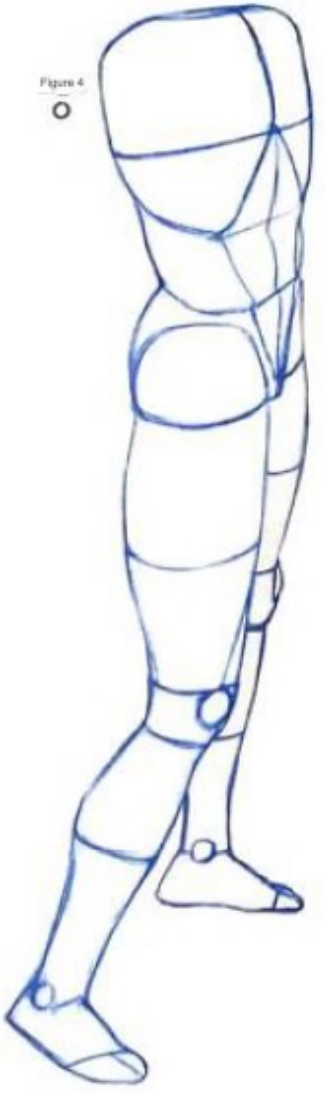
Figure 1X

Figure 2

As shown in Figure 1, if the toes of the side carrying the weight point to the side, the knee cannot be fixed and bends. As shown in Figure 2, the end must face inward to support the weight stably without bending the knee joint without putting any force on the leg.

Figure 3

Figure 4



If the foot on the weight-bearing side is pointed inward, the foot on the non-weight-bearing side will not be greatly affected by the angle. The important thing is that the direction of the toe carrying the weight is facing the hanbok. The posture on the right page is the same as Figure 4.

Muscle binding flow ▲

Unless you have a bodybuilder's body, the brachialis and biceps brachii muscles usually do not look split.

Anatomy and Appearance

▸ At this angle, the boundary between the biceps femoris muscle and the latissimus femoris muscle is clearly visible.

The iliac tibial band surrounds the radioulus laterally, but is not clearly visible on the surface.

In a typical swordsmanship stance, the direction in which the sword is drawn and the direction of gaze are the same.

◂Position for pulling a knife out of a sheath The hand holding the sheath at the waist is fixed and the opposite arm and body rotate to grab the handle of the knife. When pulling out the knife, move only the horse and pull it forward. The posture of drawing a sword often appears in illustrations and comics, but it is a difficult movement that requires such detailed movements.

When the leg that is not bearing weight falls back and the toes point forward, the heel is lifted slightly as shown in the picture. Try the pose yourself.

From this angle, you can see more clearly how twisted your torso and pelvis are.

■ Holding a knife with one hand

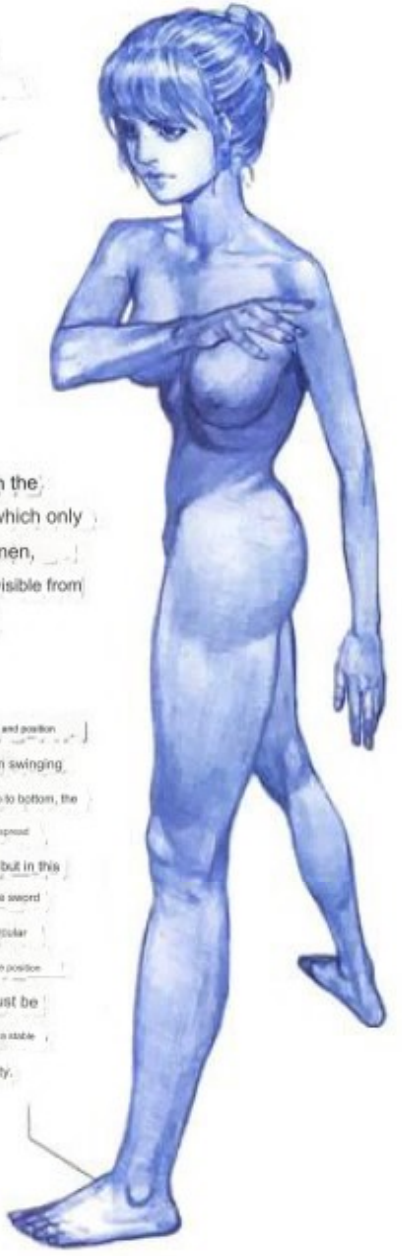
Lightly swinging a sword

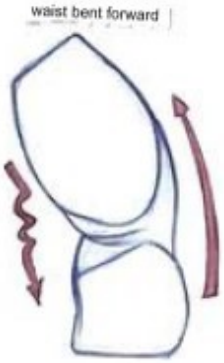
If you look at the state in which the body's tilt is not significantly different and the knees are not bent, you can see that the posture is to swing the sword lightly. Ready posture

This allows you to infer the intensity of the next movement.

Wrinkles on the hip ridge, which only appear in men, are clearly visible from this angle.

Direction of the sword and position of the feet When swinging the sword from top to bottom, the position of the feet is spread back and forth, but in this position, where the sword is swinging in a circular motion to the side, the position of the feet must be diagonal to maintain a stable center of gravity.





• Feeling of posture according to the movement of the waist A posture with the arms hanging down and the waist bent forward gives a feeling of comfortable relaxation, while a posture with the arms raised in the opposite direction of gravity and the waist bent back gives a feeling of tension.

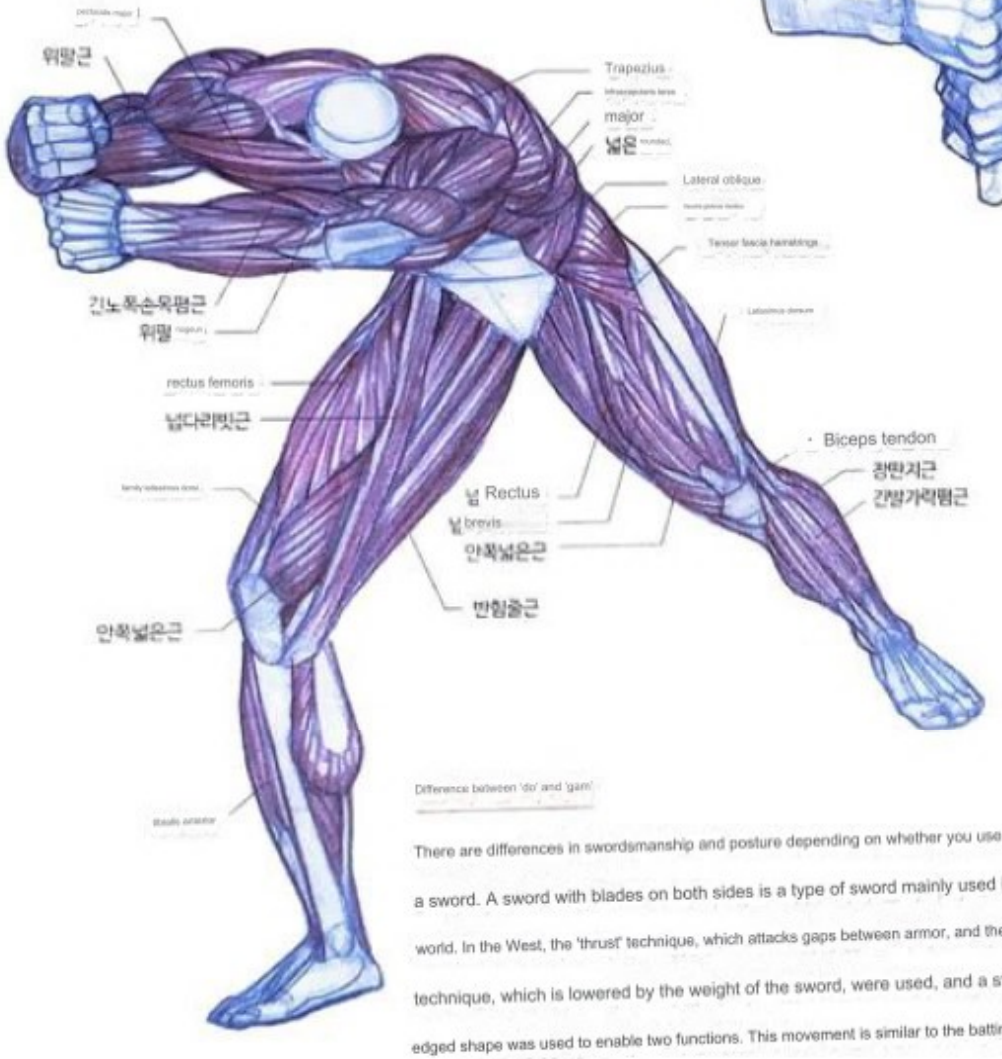
As shown in the picture, when divided vertically from the side, the position of the line that equally divides the volume of both areas becomes the center of gravity.

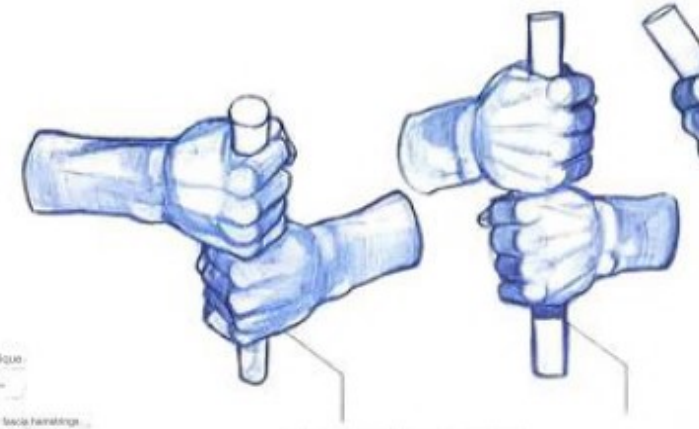
Holding a sword with one hand and swinging it

This is the action immediately after swinging the sword in the stance on the left page. When swinging a sword with one hand, the opposite arm extends in the opposite direction of the sword swing movement to control the center of gravity. Swinging the sword sideways has less power than swinging it forward, but the attack range is wider.

Because this posture does not involve twisting the body, the slopes of the key points must converge to one point.

• Position with the knife raised close to the body





Hand posture holding the sword close to the

body If you bend your arm and bring the sword close to your body

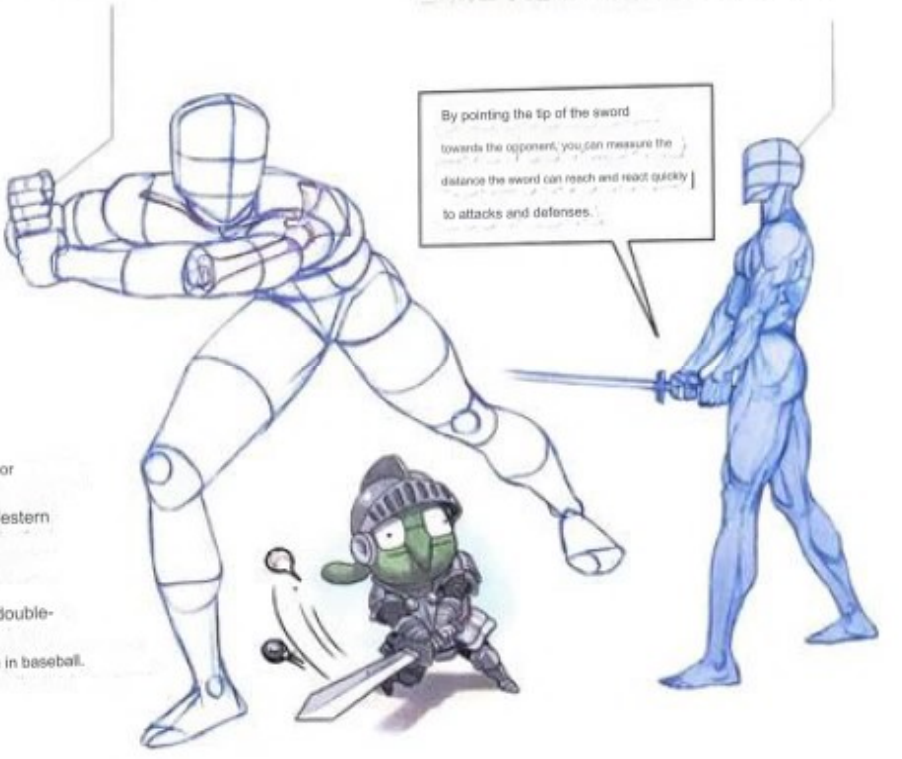
like the posture on this page, the sword will be held vertically.

The most common hand gesture when holding a knife with both hands.

This is a hand gesture made when the arm is stretched out and the knife is

pointed at the opponent with the knife away from the body. The angle where

the wrists intersect is narrow, and the tip of the knife points straight ahead.



Difference between 'do' and 'gam'

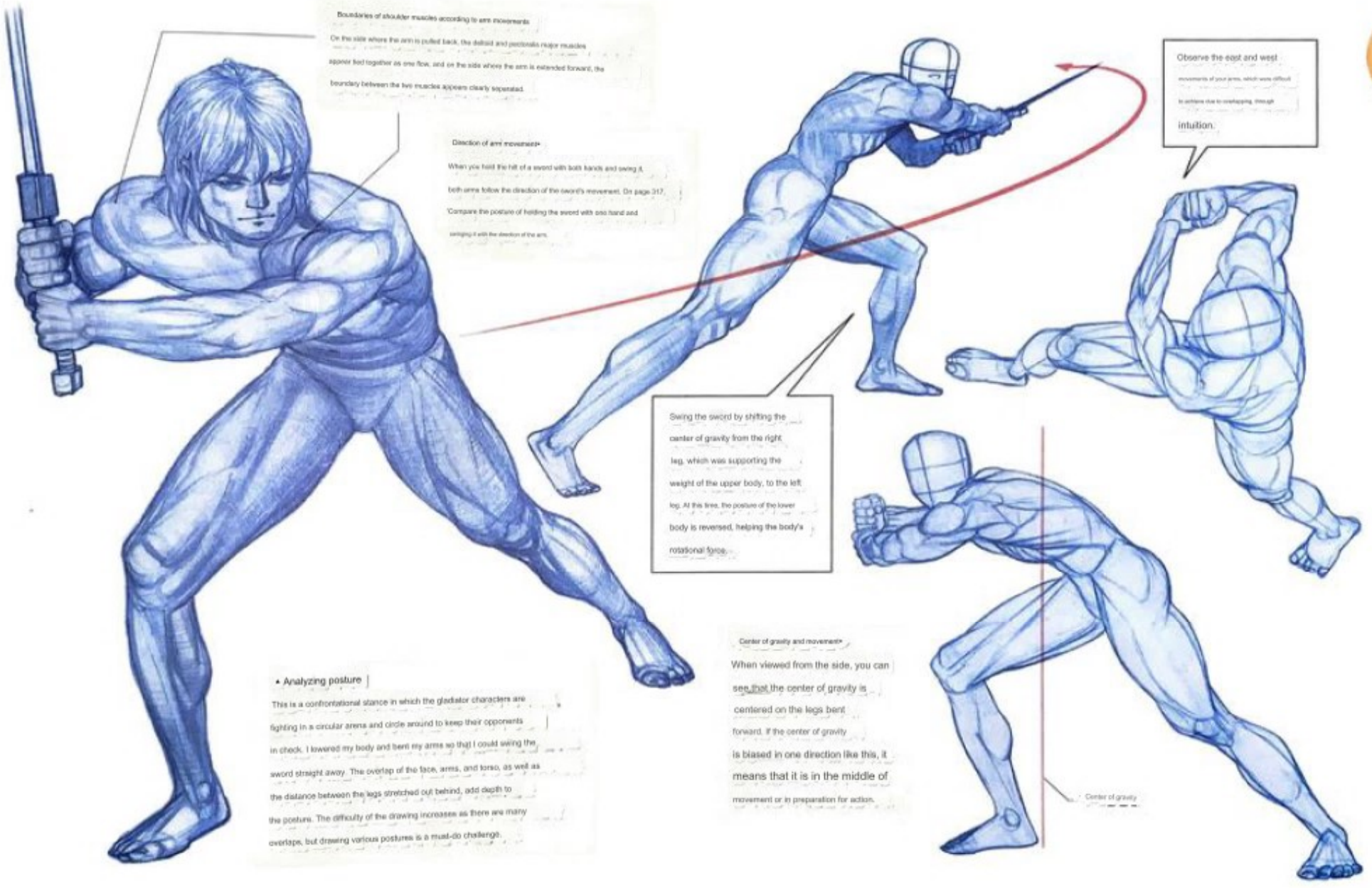
There are differences in swordsmanship and posture depending on whether you use a sword or

a sword. A sword with blades on both sides is a type of sword mainly used in the Western

world. In the West, the 'thrust' technique, which attacks gaps between armor, and the 'slash'

technique, which is lowered by the weight of the sword, were used, and a straight, double-

edged shape was used to enable two functions. This movement is similar to the batting stance in baseball.



Boundaries of shoulder muscles according to arm movements

On the side where the arm is pulled back, the deltoid and pectoralis major muscles appear tied together as one flow, and on the side where the arm is extended forward, the boundary between the two muscles appears clearly separated.

Direction of arm movement

When you hold the hilt of a sword with both hands and swing it, both arms follow the direction of the sword's movement. On page 317, compare the posture of holding the sword with one hand and swinging it with the direction of the arm.

Observe the east and west movements of your arms, which were difficult to achieve due to overlapping, through intuition.

Swing the sword by shifting the center of gravity from the right leg, which was supporting the weight of the upper body, to the left leg. At this time, the posture of the lower body is reversed, helping the body's rotational force.

▲ Analyzing posture

This is a confrontational stance in which the gladiator characters are fighting in a circular arena and circle around to keep their opponents in check. I lowered my body and bent my arms so that I could swing the sword straight away. The overlap of the face, arms, and torso, as well as the distance between the legs stretched out behind, add depth to the posture. The difficulty of the drawing increases as there are many overlaps, but drawing various postures is a must-do challenge.

Center of gravity and movement

When viewed from the side, you can see that the center of gravity is centered on the legs bent forward. If the center of gravity is biased in one direction like this, it means that it is in the middle of movement or in preparation for action.

Center of gravity

■ sword fighting stance

defensive readiness

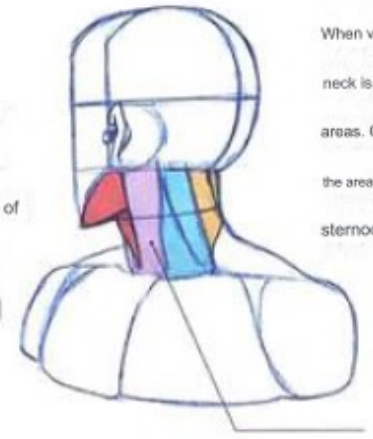
A stance in preparation for a sword fight with an opponent, with the side of the body facing the opponent to protect the heart from stab attacks.

The upper body is in a static posture, but the curved slope of the lower body creates a dynamic flow.

Passive lower body flow>
If you do not boldly move your legs back, you will end up in a posture that feels awkward.

division of the neck

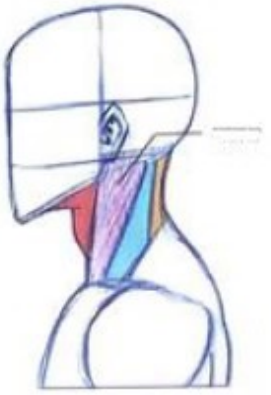
When viewed from the side, the neck is divided into four major areas. Observe and classify the area based on the most prominent sternocleidomastoid muscle.



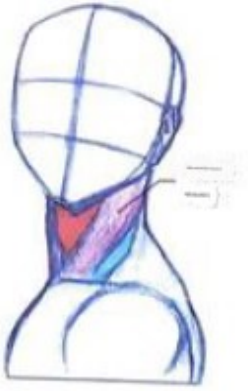
Contraction of the sternocleidomastoid muscle When the left

Changes in area (1)▸
The blue area between the sternocleidomastoid and upper trapezius muscles widens and narrows depending on the direction you turn your head, with the blue area being widest in this position. The upper trapezius muscle is attached to the bottom of the back of the head, so the upper trapezius muscle is visible as much as the back of the head is visible.

Changes in area (2)▸
If you turn your head like this, the blue area appears narrowest, but the blue area of the jade on the other side becomes wider. Since the back of the head is not visible, the upper trapezius muscles are not visible because they are backwards.



upper

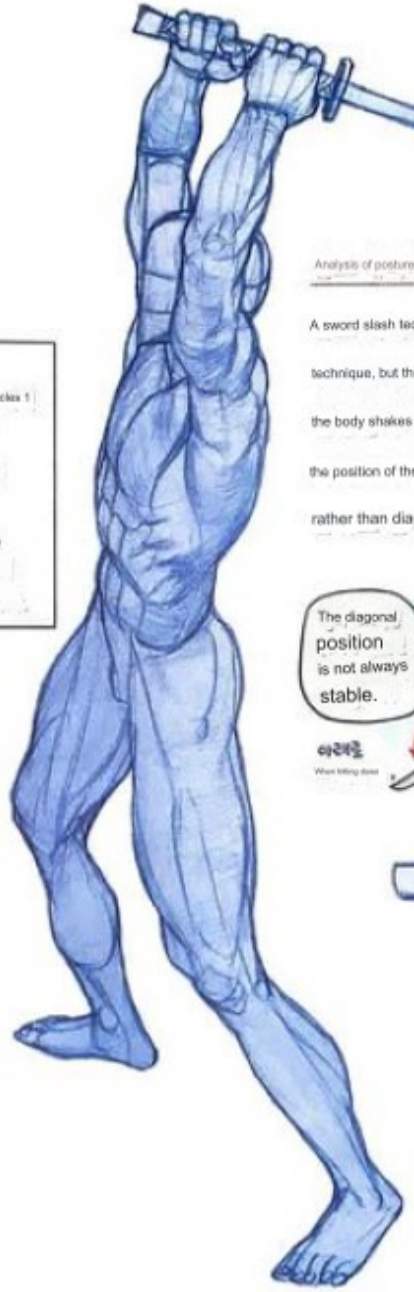


Light and dark part in the upper arm

The light and dark side of the deltoid muscle creates a flow that seems to surround the biceps brachii muscle.

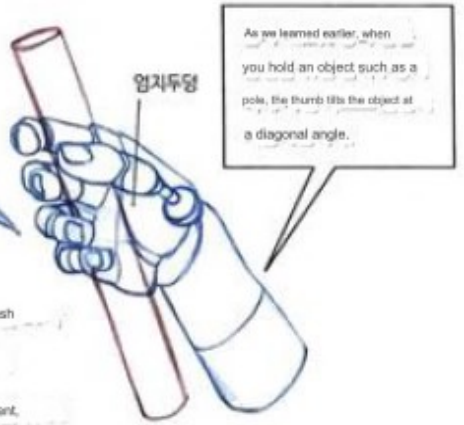
•The brachialis longus, carpi longus and the flat muscles 1 and 2 of #2 are each bundled into one lump, and •the flat muscles of #1 are divided into the flat muscles 3 and the thumb flexor thumb muscle of #3, making a total of four lumps.

Flow of the hemilateral side: Based on the gastro-iliac spine, the sternocleidomastoid muscle and the longus fascia hamstrings extend in a ^ shape, creating a shape where the rectus femoris muscle digs in between them. This flow is seen when the pelvis is facing hemilaterally.



Analysis of posture when striking with a knife

A sword slash technique is more powerful than a sideways slash technique, but the attack range is limited to the front. Since the body shakes back and forth during the downward movement, the position of the feet should be spread forward and backward rather than diagonally to maintain balance.



Special hand movements holding the sword hilt • When you raise your hand high to strike the sword as shown in the picture on the left, the weight of the sword is shifted backwards, so the tilt of the sword hilt and wrist approaches a right angle.

Common hand gestures holding a sword hilt•

Hold the knife forward as shown on the left page.

When aiming, the hand movement is such that the hilt of the sword and the angle of the wrist meet at an angle. A similar example is the shape of a hand pointing a gun.

■ Downward defense stance

Characteristics and defensive stance of 'Tao'

A road with only one edge

It was mainly used in Asia, and the blade was curved, so it was better to stab than to stab.

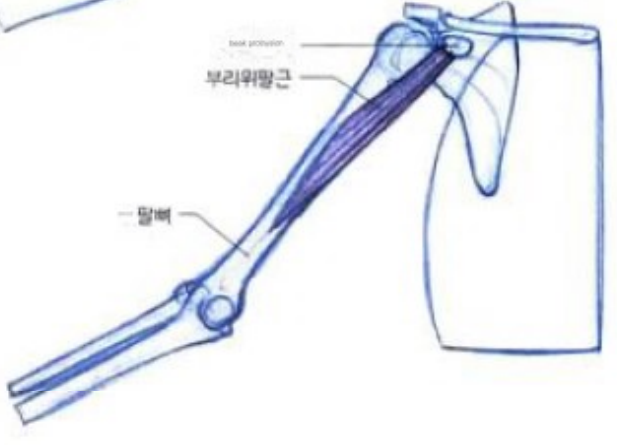
It is a suitable form for 'cutting'. Western swords have sharp double-edged blades, making them prone to breaking when the swords collide with each other, but swords have a thick edge on one side, making them relatively advantageous for blocking the opponent's sword with the back of the sword. The movement you will learn this time is a posture to defend against an opponent's downward attack. Since you have to defend from the head, which is at the highest point, the position of the sword must be raised above the head.

◀ a framework that serves as a guidepost

When viewed from the side, the femur is located in the middle of the thigh, and the tibia is toward the front of the calf. The areas where bone and flesh are in close contact are exposed and serve as a guidepost for determining proportion and muscle position.

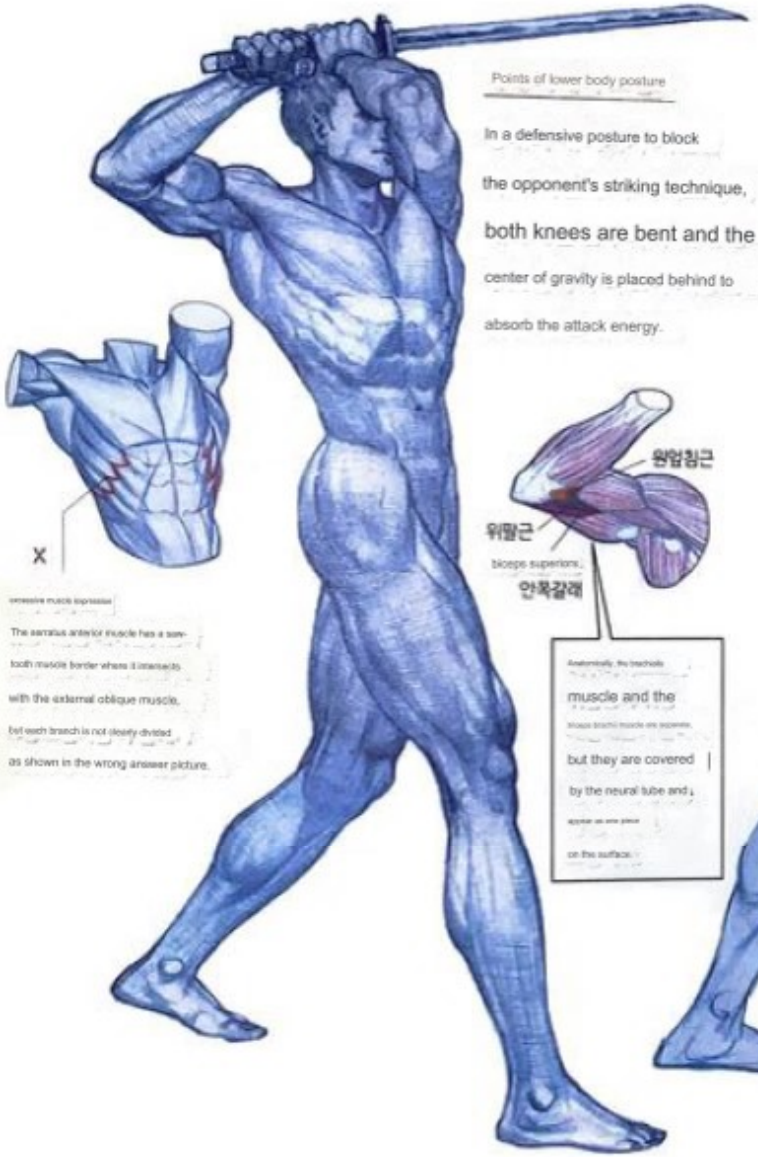
posture with arms raised 외

처크포인트!



Coriobrachialis ▲

When you raise your arm, the shape of your brachiocephalic muscle is revealed. This is a muscle that becomes a focal point when drawing the inner side of the arm, whose shape is unfamiliar because we don't usually get a chance to see it. The coracoid muscle originates from the coracoid process and attaches to the humerus. Most of it is hidden by the deltoid scapulae, pectoralis major, and biceps brachii, so only the pointed triangular shape is visible. The supraspinatus helps the pectoralis major to bring the arm inward.



Points of lower body posture

In a defensive posture to block the opponent's striking technique, both knees are bent and the center of gravity is placed behind to absorb the attack energy.

X

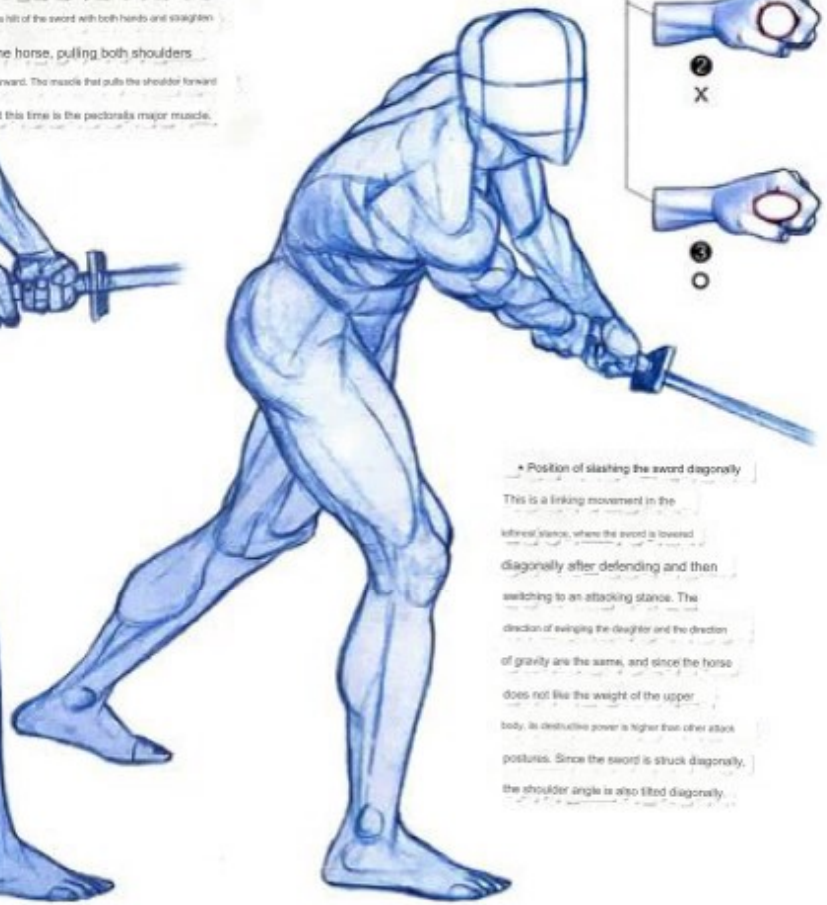
The serratus anterior muscle has a saw-tooth muscle border where it intersects with the external oblique muscle, but each branch is not clearly divided as shown in the wrong answer picture.

Anatomically, the brachialis muscle and the biceps brachii muscle are separate, but they are covered by the neural tube and appear as one piece on the surface.

• Posture before lifting the sword Hold the hilt of the sword with both hands and straighten the horse, pulling both shoulders forward. The muscle that pulls the shoulder forward at this time is the pectoralis major muscle.

cross section of knife handle

• If the handle is angled as shown in the picture above, if you swing the knife multiple times, the edge will press into your skin and hurt your palm. If the handle is circular as shown in the picture, there is stability, but the handle rotates, making it difficult to know the direction of the blade. If the handle is oval as shown in picture 3, you can hold it stably, and since the handle does not turn, you can recognize the direction of the blade.



• Position of slashing the sword diagonally

This is a linking movement in the kotinesi stance, where the sword is lowered diagonally after defending and then switching to an attacking stance. The direction of swinging the daughter and the direction of gravity are the same, and since the horse does not like the weight of the upper body, its destructive power is higher than other attack postures. Since the sword is struck diagonally, the shoulder angle is also tilted diagonally.

■ Attitude in a surrounded situation

tiptoe posture

In tiptoe position, the joints that rotate the ankles can work, causing the toes to point at a different angle than the knees.

When the sole of the foot touches the ground, if the sole is resting on the ground, the direction of the knee and toe should be the same. At this time, the joint that moves the ankle left and right cannot function.

Readiness according to the situation

In this posture, you are surrounded by a large number of people and do not have time to turn your head to keep an eye on the enemy, so you can use the sword as a mirror to observe the movements of the enemy behind you reflected on the side of the sword. It is also a posture used to attack after reflecting light onto the side of the sword to block the opponent's vision.

Muscle deformation caused by relaxation and contraction

• When understanding the human body through shapes and then expressing the flow of the human body on it, the most difficult thing is the change in muscles that are not fixed. Since muscle deformation occurs solely through relaxation and contraction, it is necessary to know the function of each muscle.

• Diagonal slash preparation posture

Reaper's Slash Sword Direction

The direction of the sword is pointing backwards, showing that it is a ready posture for attack rather than defense. Additionally, in order to make a diagonal cut, the direction of the raised knife turns to the side and both feet are positioned diagonally. The direction of the knife is curved to the side to increase the rotational force by lengthening the length of movement of the knife.

X

• This is an incorrect picture showing the relaxed large breasts with the same thickness as when they were contracted by raising the arms upward when relaxation and contraction were not applied.

X

• When you don't think about the framework

If you do not express the flow of the ribs that stand out due to the movement of the upper body leaning back, the depth of the torso will be lost and no tension will be felt in the posture.

• Upper body posture immediately after diagonal slash

When the knife is struck with a diagonal cut, one arm is pulled forward and the other arm is pulled back, tilting the shoulder. In this angle, the location of the clavicle must be identified to preserve the pectoralis major muscle area.

Reasons for cross-leggedness:

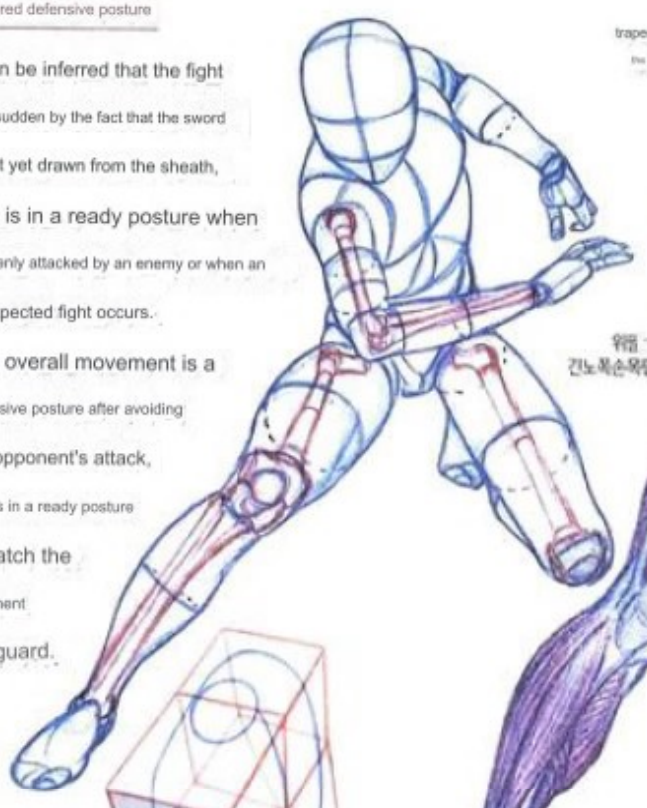
The back leg is bent inward to kick off the floor, and the front leg is bent inward to handle the rotational force.

■ Attitude to respond to surprise attack

lowered defensive posture

It can be inferred that the fight was sudden by the fact that the sword is not yet drawn from the sheath, as it is in a ready posture when suddenly attacked by an enemy or when an unexpected fight occurs.

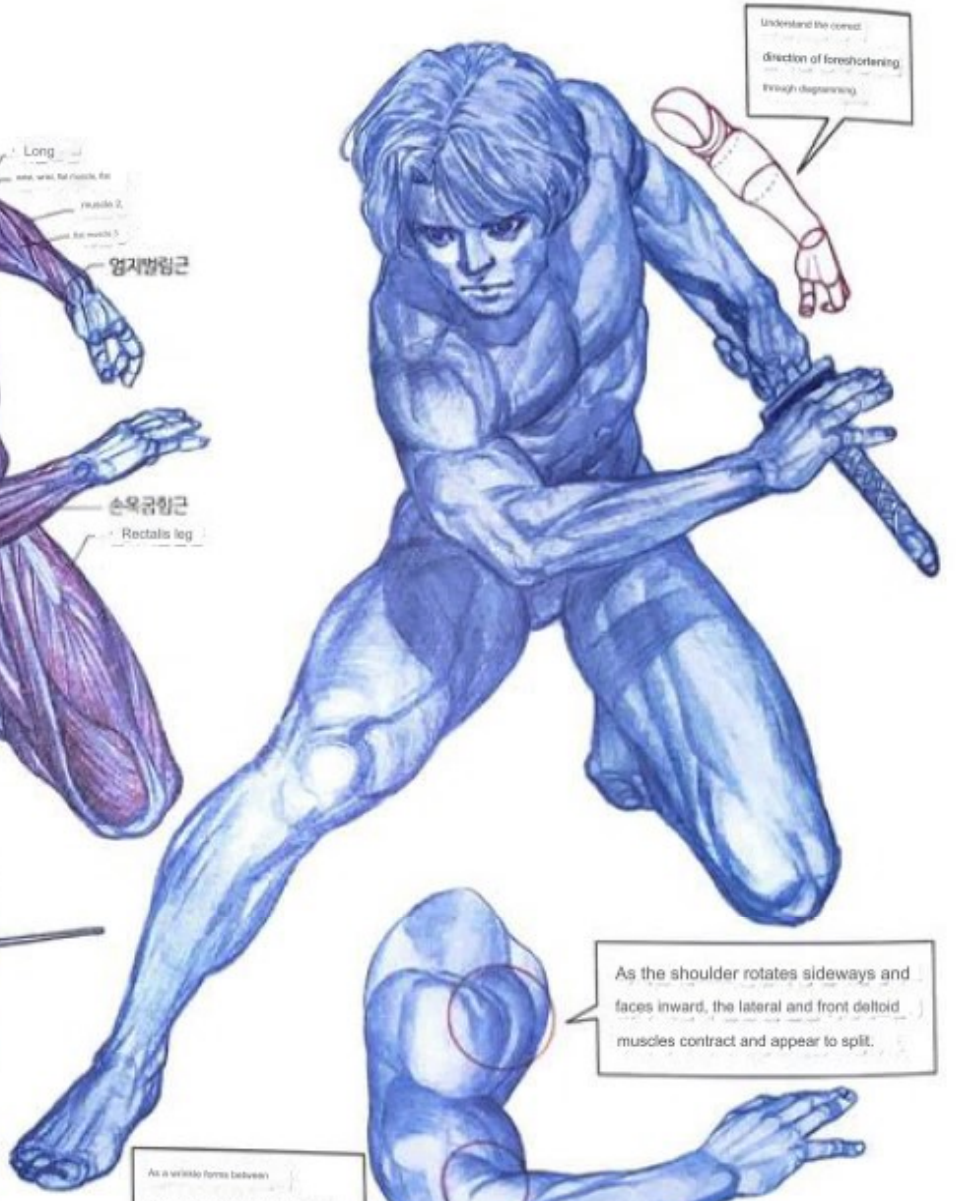
The overall movement is a defensive posture after avoiding the opponent's attack, and is in a ready posture to catch the opponent off guard.



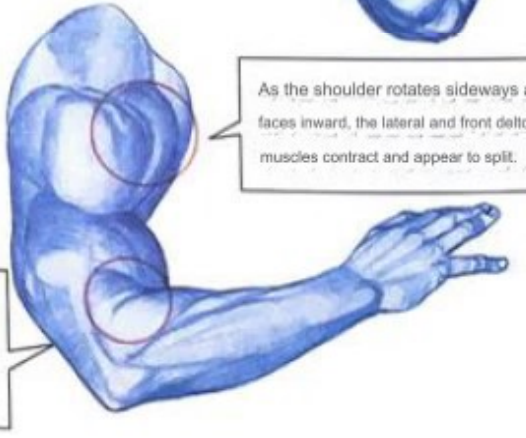
Observe the tilt of the pelvis obscured by the arms through the torso box.

Center of gravity tilted forward •

The fact that the center of gravity is tilted forward when the body is lowered suggests that the movement is for an attack. If the center of gravity is in the front, you can put more weight on it when swinging the sword.



Understand the correct direction of foreshortening through diagramming.



As the shoulder rotates sideways and faces inward, the lateral and front deltoid muscles contract and appear to split.

As a wrinkle forms between the carpi longus longus and the brachioradialis muscle, the two muscles press against each other and swell.

Principle of Battōjutsu

Quickly remove the knife from the sheath

This is a technique to pull out

and strike the opponent.

The principle of this technique

is that the friction generated when

the knife is pulled out of the

sheath is converted into speed energy

the moment the knife comes out, swinging

the knife in an oval. It's the same

principle as pulling and

releasing a bowstring. However, it

is not a technique as destructive as it

appears in cartoons. It is a technique

for attacking the opponent by

surprise. Just as in Western movies

there were duels in which gunmen

drew their guns quickly and struck

first, it is said that Japanese samurai

also fought using this martial arts

technique.

Posture after swinging a sword *

When you swing a knife, your lower body, torso, arms, and wrists create

rotational force. As in the punching movement we learned earlier, the

power of the lower body kicking the ground with the leg extended

backwards becomes the center of kinetic energy. These movements apply to

all other swinging positions, so make sure you know them. For example,

the posture of a baseball batter swinging the bat is similar to this picture.

Attitude to have centrifugal force*

To maximize the centrifugal force swinging the sword, twist your waist

and turn the sword at your waist towards the waist to create a distance

for the sword to rotate.

*The pros and cons of Tao

The sword, which is suitable for cutting techniques with a curved blade, has excellent killing power, but is not very

effective in wars fought while wearing armor. Spears and spears that pierce armor, or blunt weapons that strike like maces or

axes, are useful on the battlefield. In Korea, Tao did not develop because people could not possess weapons except during

times of war, but in Japan, it developed as the samurai class used Tao for training purposes.

■ One hand down seen from a high angle

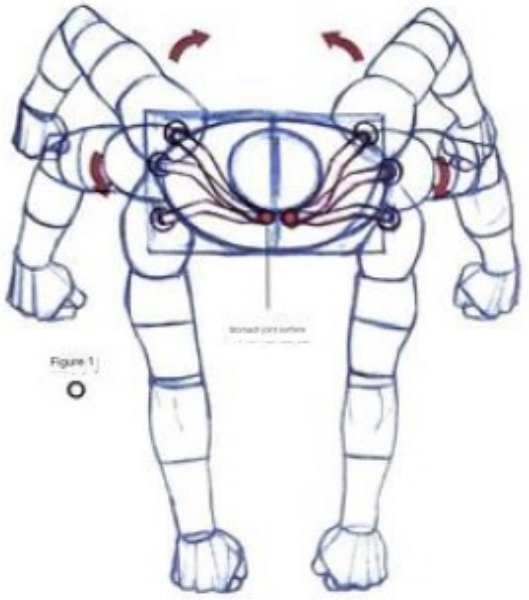


Figure 1

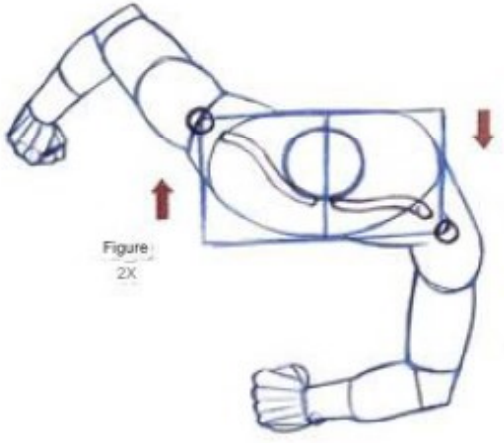
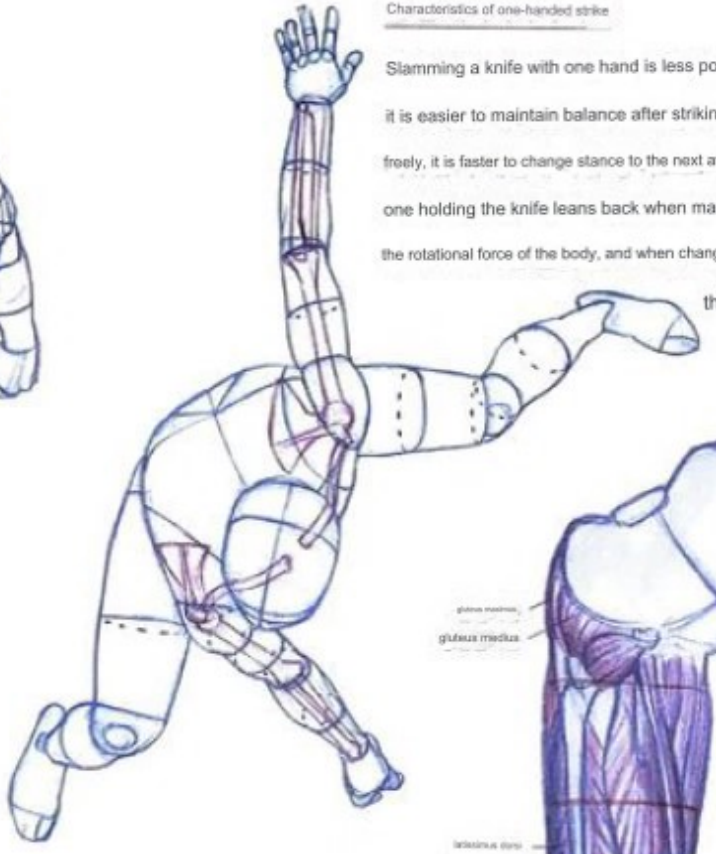


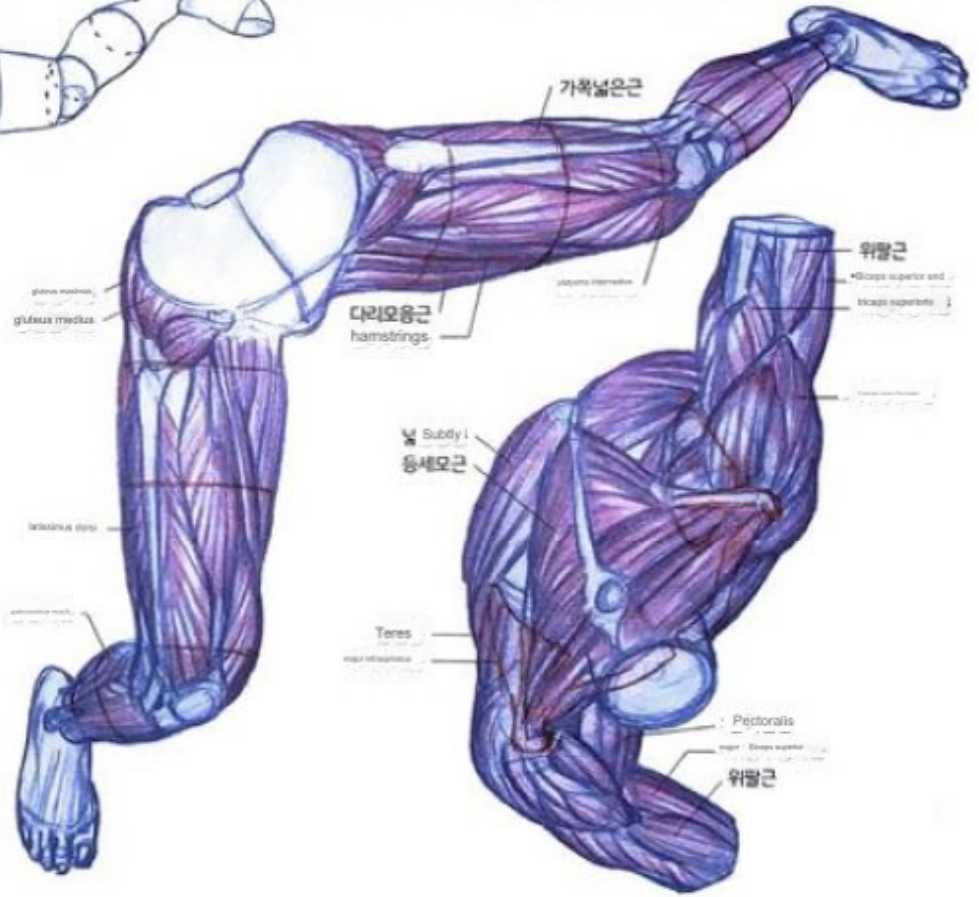
Figure 2X

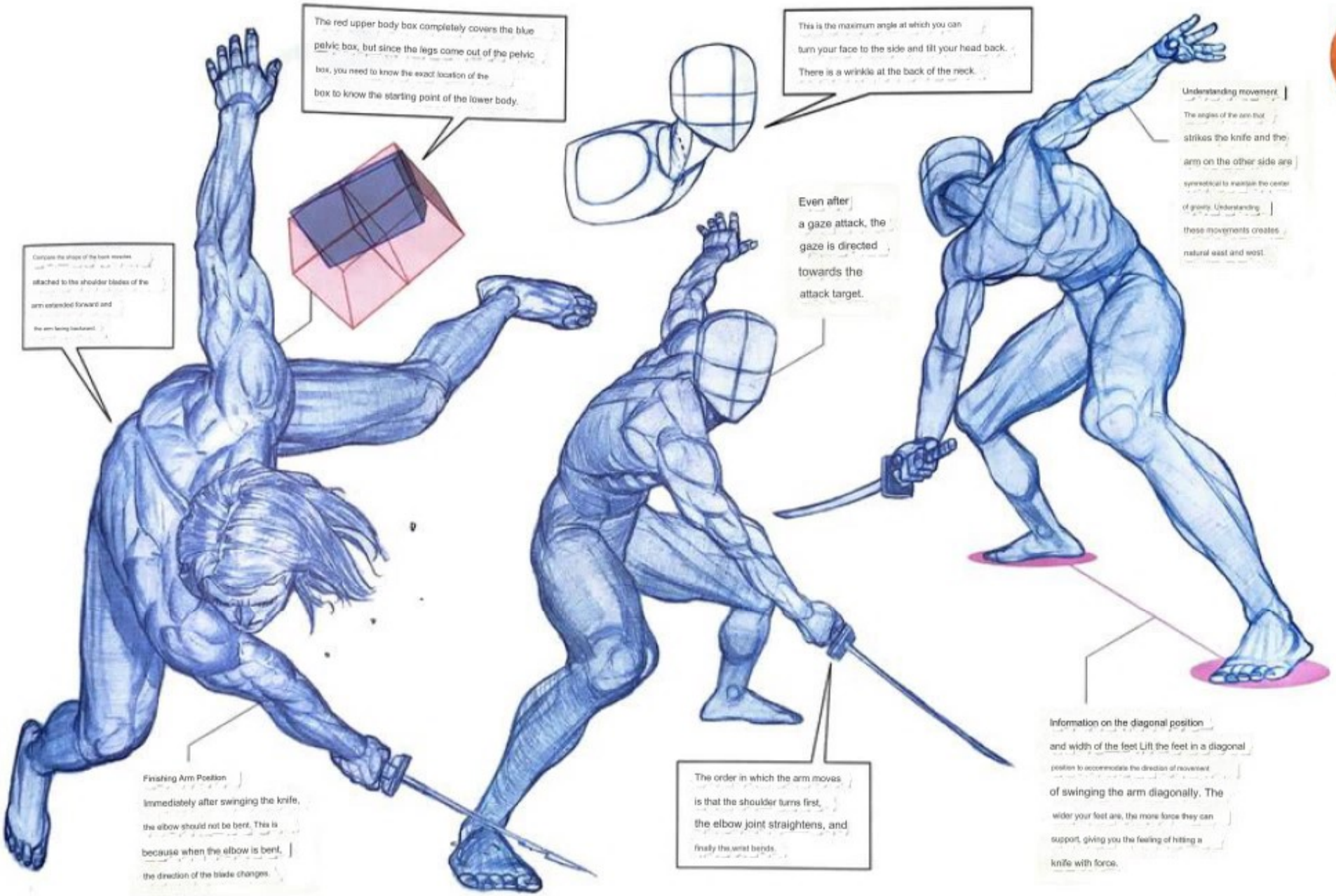
Shall we review the shoulder movements we learned in Chapter 1? As shown in the picture, when the shoulder moves back and forth, it draws an arc based on the sternoarticular surface of the clavicle. As shown in Figure 2, if the shoulder joint is not fixed to the end of the clavicle and moves back and forth, it is the same as dislocating the shoulder blade. Another example of the most common mistake is to only move the arms without moving the shoulders back and forth at all.

Characteristics of one-handed strike

Slamming a knife with one hand is less powerful than holding the handle with both hands, but it is easier to maintain balance after striking. Additionally, because the upper body moves freely, it is faster to change stance to the next attack. The arm opposite to the one holding the knife leans back when making a downward motion, increasing the rotational force of the body, and when changing posture, it changes direction and maintains the center of gravity, like an animal balancing with its tail.



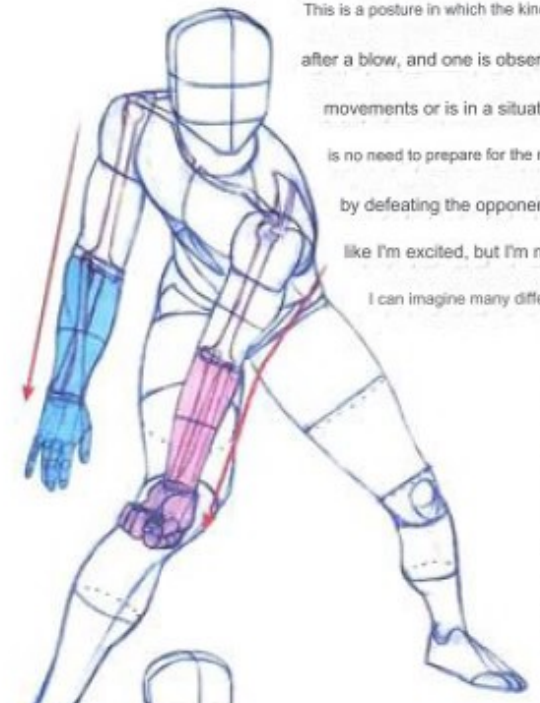



The red upper body box completely covers the blue pelvic box, but since the legs come out of the pelvic box, you need to know the exact location of the box to know the starting point of the lower body.
This is the maximum angle at which you can turn your face to the side and tilt your head back. There is a wrinkle at the back of the neck.
Even after a gaze attack, the gaze is directed towards the attack target.
Understanding movement
The angles of the arm that strikes the knife and the arm on the other side are symmetrical to maintain the center of gravity. Understanding these movements creates natural east and west.
attached to the shoulder blades of the arm extended forward and
Finishing Arm Position
Immediately after swinging the knife, the elbow should not be bent. This is because when the elbow is bent, the direction of the blade changes.
The order in which the arm moves is that the shoulder turns first, the elbow joint straightens, and finally the wrist bends.
Information on the diagonal position and width of the feet Lift the feet in a diagonal position to accommodate the direction of movement of swinging the arm diagonally. The wider your feet are, the more force they can support, giving you the feeling of hitting a knife with force.

■ Posture after striking a blow

Posture after exhaling diagonally

This is a posture in which the kinetic energy is dissipated after a blow, and one is observing the opponent's movements or is in a situation where there is no need to prepare for the next attack by defeating the opponent. It's not like I'm excited, but I'm not relaxed either, so I can imagine many different situations.

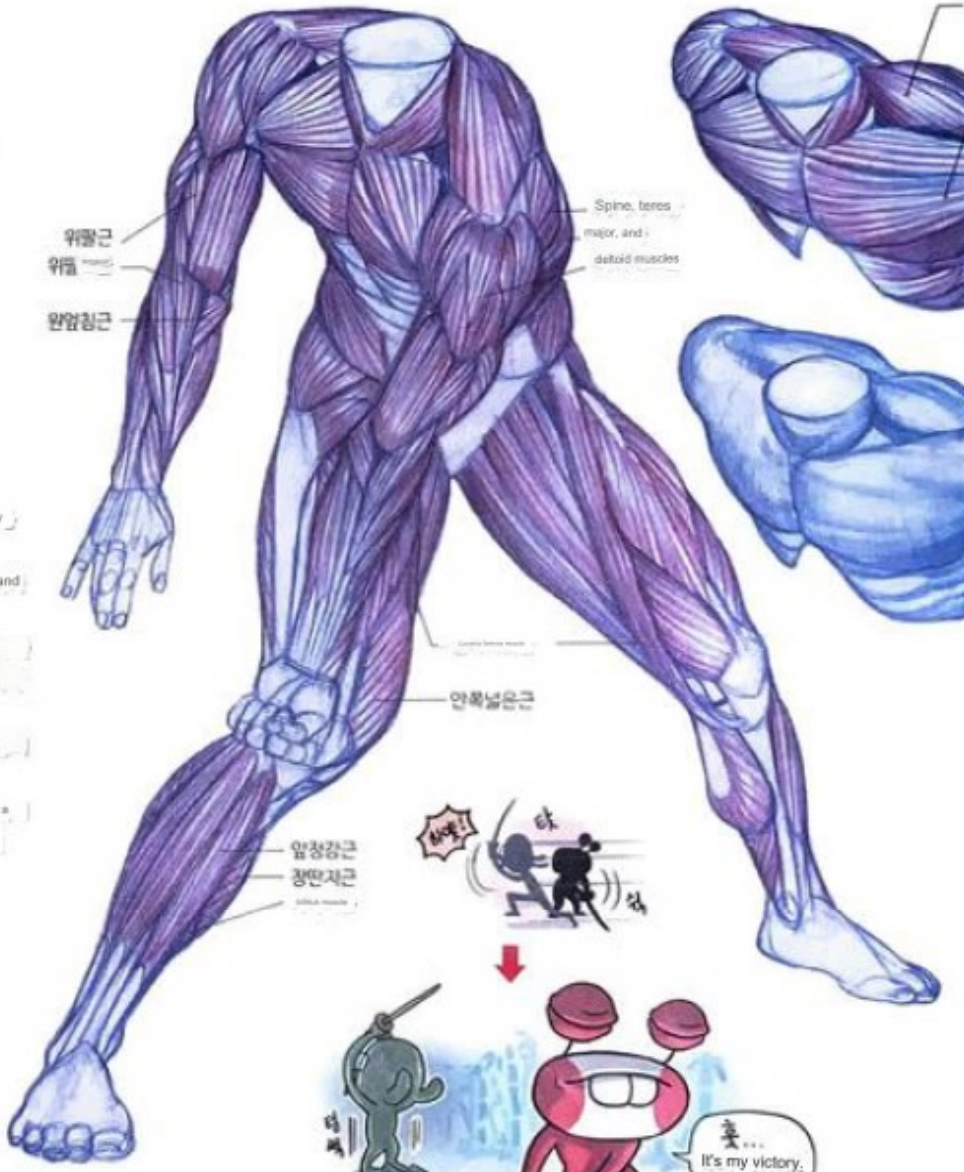


◀ Hand direction and arm flow

The red one with the palm facing forward has the Java and Noh aligned in an 11 shape, while the blue one with the palm facing forward has the Java and Noh twisted in the shape of an X. The overall flow of a blue horse with twisted bones is straight, while the flow of a red horse with an untwisted tongue has a single bend.

•Shoulders that don't move

In the picture, the most common mistake in shoulder movement is that the shoulder does not move back and forth, but only the arm. In this case, the movement becomes rigid and feels unnatural. In the posture on this page, the shoulder direction pulls the shoulder holding the knife forward and the opposite shoulder back.



▲ Shape change according to movement

Let's look at how the structure changes anatomically and externally when a horse stretched forward is tilted back at the same angle as the picture on this page. When you extend your arms forward, the pectoralis major muscle contracts and the trapezius muscle relaxes. Conversely, when you lean your arm back, the pectoralis major muscle relaxes and the trapezius muscle contracts.

Shoulder movements that have a significant impact on shape change

When you open your arms out to the sides to hold a knife, you can see a big change in shape even though only the arms are moving. At this time, the shoulder, which always moves along with the arm, has a great influence on the change in shape.

Characteristics of a woman's twisted waist> The characteristic that appears when a woman twists her waist is that wrinkles appear below the ribs and the wrinkles are thick due to the fat layer. Wrinkles along the iliac crest that occur in men rarely occur in women.

After the face, hands reveal emotions. In our daily lives, we learn a lot of information through other people's hand movements. The same goes for pictures. If you look at the male character's hand movements, you can feel relaxed as one hand is not holding a sword, but the female character's tightly clenched fist gives a feeling of strength or tension.

Developing a character concept ▲

"With the blind swordsman setup, you have to read the opponent's movements through sound, so you listen in the direction of the sound, and without moving yourself, you prepare to cut when the opponent approaches. You stay still and then receive external stimulation. You can bring out the character by applying the appearance of an insect that reacts instantaneously to a character. The long sword held in one hand is used as a weapon to primarily attack when the enemy approaches, and when the attack fails, the dagger is used as a secondary weapon. The setting is to engage in close combat using

■ side cutting posture

Drawing structural shapes

At angles where the shoulder blade affects the outer silhouette, the shape is hardly affected by the shoulder blade, but you need to practice drawing the skeleton so that when you develop a more complex drawing style, you can use the skeleton to create a structural form.

Lower body posture The body must be tilted in the direction of the attack to carry weight, so the direction of the attack and the leg with the knee bent must be the same.

If you look at the incorrect lower body movement, the opposite knee is bent, the center of gravity becomes unstable, and the direction of movement is not unified, giving a feeling of off-beat.

Among the muscles in the arm joint area, the most prominent muscles on the outside are the brachialis brachii and the longus carpi platysma. This is the pronation muscle.

It is characterized by the shape of the wrist flat muscles digging into the lateral muscle joint prominence.

Drawing the instep according to the angle

No matter how good your upper body posture is, if the shape of your feet on the ground does not match the timing, your overall posture will look unstable. When drawing feet, the feet are often drawn from the side regardless of the angle. The reason the feet are drawn out of proportion to the space is because the human body was drawn first and then the space was set. First, you need to set up a space and then draw the human body on it, so you can break away from the habitual foot shape and draw feet that fit your perspective.

Analyze your posture

This is what it looks like after making a 'sideways cut' with a dagger. It is lighter than a long sword and does not have much effect on the center of gravity. Your posture changes depending on the weight of the weapon you are holding.

The importance of sight

Your gaze direction before and after swinging the sword should be the same. Based on your line of sight, you can measure the range of the attack and the degree to which your body is twisted.

ready to swing

As with other sideways slash poses, twist your body as much as possible to create distance to rotate. Both arms face in opposite directions, and when swinging the sword, they maintain the opposite direction and the body rotates like a top.

If the volume of the chest cage is not expressed as shown in the picture and the center line of the body flows straight, the wrong picture shows a flat body.

O

X

As your knees straighten, your heels come off the floor, giving you the feeling of hitting the ground hard.

The weight of the object held in the hand • Just as you can estimate the weight of the object held by the person's center of gravity when you see a person holding an object, the flow of the human body should be expressed differently depending on the weight in the picture. If the expression of weight is poor, immersion in the picture will decrease.

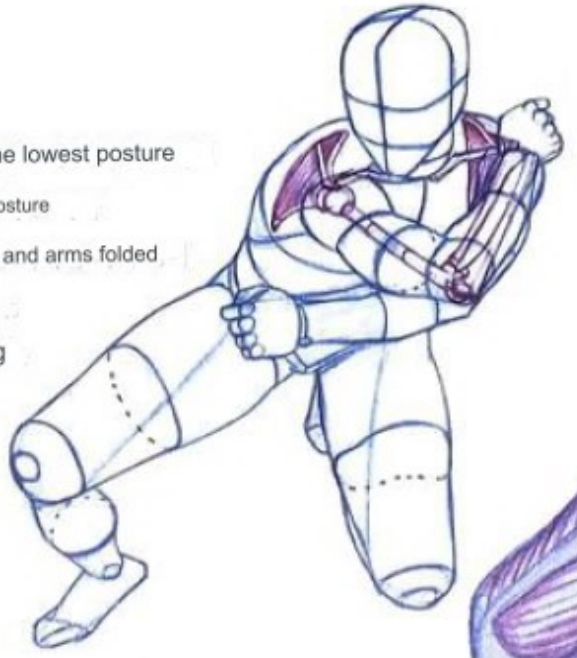
Heavy objects and light objects • When placing a heavy object, the angle of the arm is lowered, the object is often lifted with both hands, and the object is held close to the body. The lighter the object, the more freely your arms can move. In the picture above, you can guess that it is a light object because the arm is placed to the side of the body.

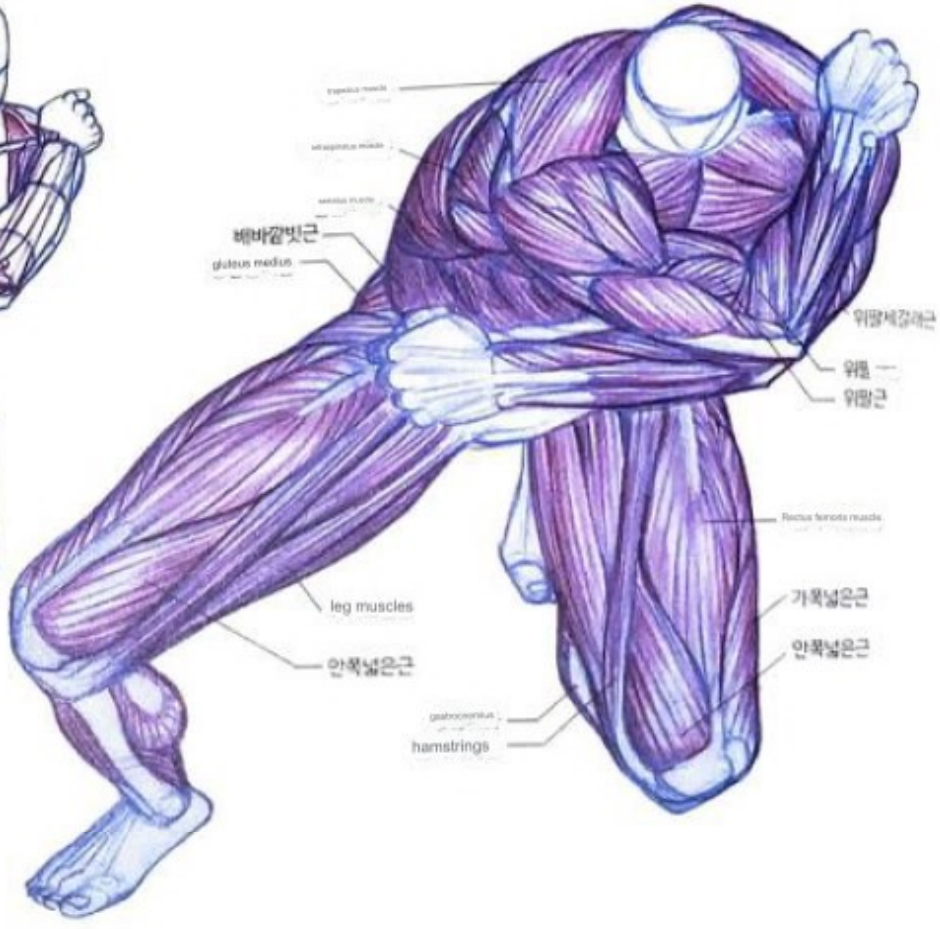
When swinging a sword, straighten the bent leg behind you to add rotational force to your body.

■ Holding a dagger in both hands

posture of hiding one's body

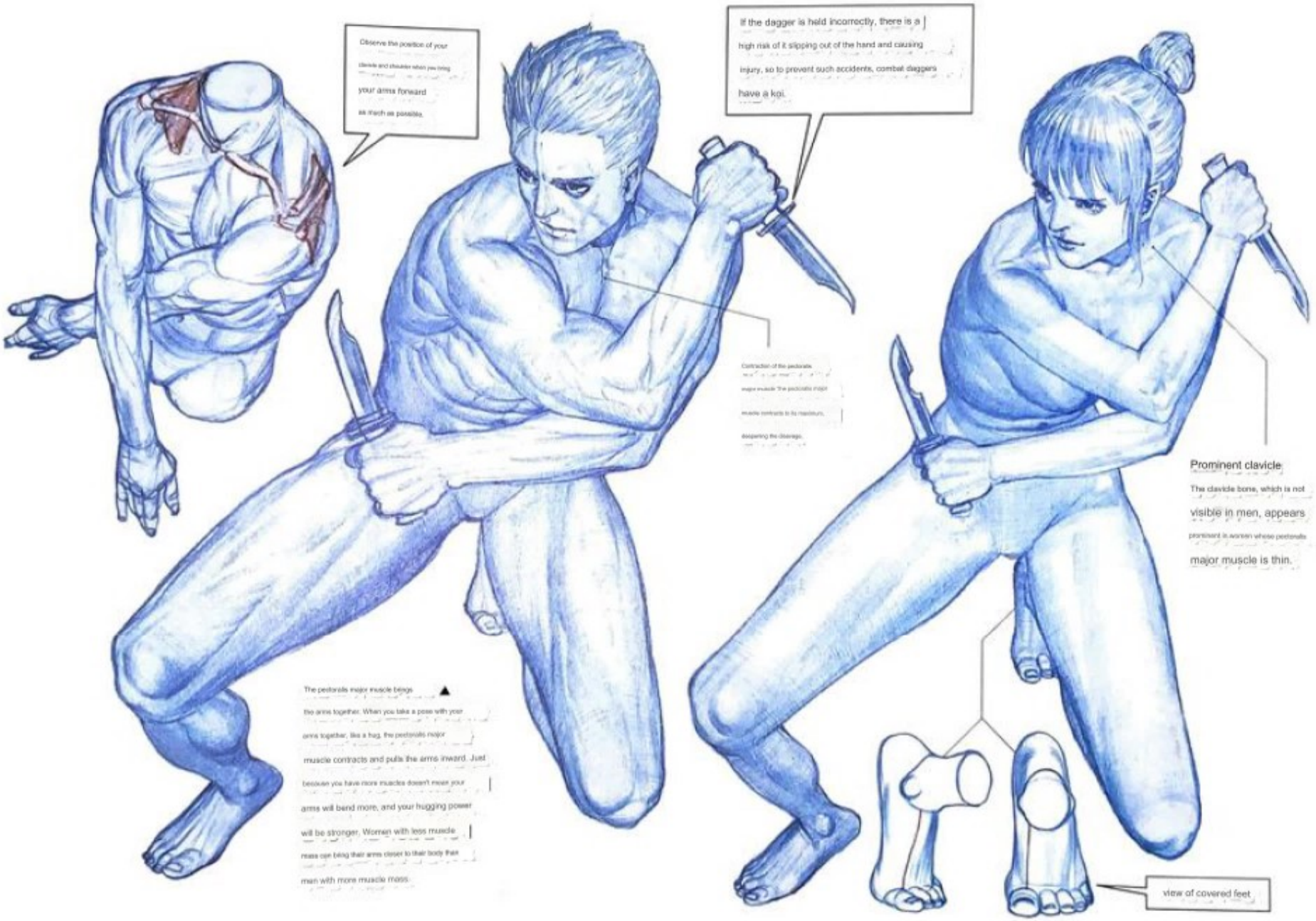
From the fact that he is kneeling and taking the lowest posture possible, we can guess that he is lurking. The ready posture of the upper body holding a dagger in both hands and arms folded in an This is a movement in which the body's center of gravity is tilted backwards, giving priority to defense rather than attack.





Characteristics of Dagger

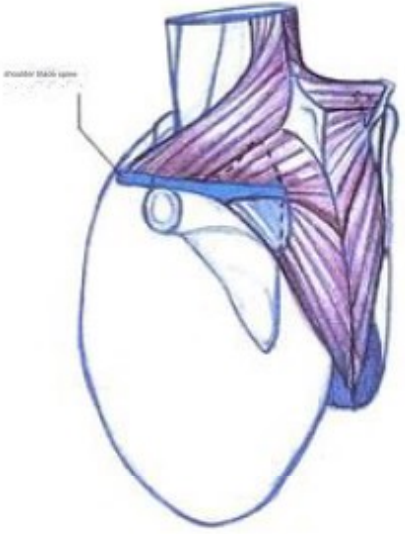
The shorter the weapon, the weaker its destructive power, so a dagger can only be used as a lethal weapon if the person using it is skilled in martial arts. The technique of using a dagger is closer to martial arts than to swordsmanship, so the style also varies depending on what martial art the person using it has mastered. Usually, the grip method can be changed at any time depending on the situation and tactics. If you stick to one stance, there will be less change in the attack pattern, making it easier for the opponent to defend. How you hold the dagger makes a big difference in terms of statement. For example, there is a way to hold the knife upward or downward as shown in the picture on the left. When the knife is held upward, it is easier to cut than to stab, and when held downward, it is used for slashing. Dagger throwing techniques also vary depending on the size and shape of the knife. The posture on the left is a technique in which you place your arms in an


Observe the position of your clavicle and shoulder when you bring your arms forward as much as possible.
If the dagger is held incorrectly, there is a high risk of it slipping out of the hand and causing injury, so to prevent such accidents, combat daggers have a koi.
Contraction of the pectoralis major muscle The pectoralis major muscle contracts to its maximum, deepening the cleavage.
Prominent clavicle
The clavicle bone, which is not visible in men, appears prominent in women whose pectoralis major muscle is thin.
The pectoralis major muscle brings the arms together. When you take a pose with your arms together, like a hug, the pectoralis major muscle contracts and pulls the arms inward. Just because you have more muscles doesn't mean your arms will bend more, and your hugging power will be stronger. Women with less muscle mass can bring their arms closer to their body than men with more muscle mass.
view of covered feet

■Pose holding a baton (1)

Posture analysis and the origins of Bongsul

This posture is a preparation posture for turning or swinging the baton, and if you raise your upper body slightly, it is very similar to the posture a baseball batsman prepares before swinging the bat. By rotating the long pole, you can use the rotational force to attack and defend, and it also has the effect of confusing the opponent. Bongsul is a defense-oriented technique that blocks the opponent's attacks. Usually, people practice with a baton, and in actual combat, they participate in war holding a spear with only the blade inserted. The spear was the most used weapon because even soldiers with a low level of training could perform a simple stab attack at an approaching enemy.

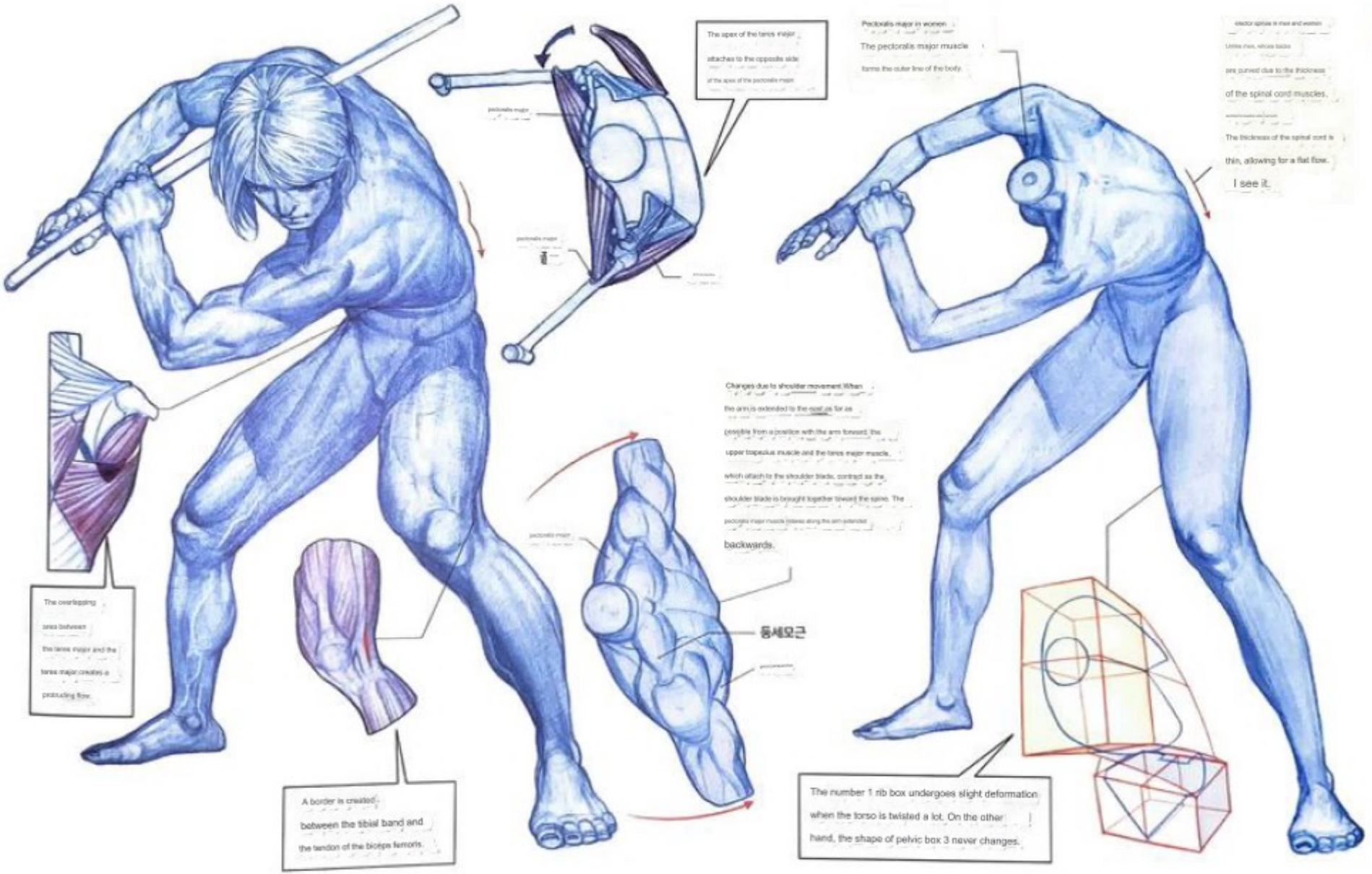


▲ Prominent shoulder spines

In women, the spine of the scapula is prominent on the outside, and in men, the trapezius muscle protrudes above the spine of the scapula, making it easy to locate the spine of the scapula. The scapula spine serves as an indicator of the position of the scapula and the muscles that attach to the scapula.

Teres major when raising and lowering the arm ▲

When the arm is lowered, the area of the teres major muscle becomes narrower than when the arm is raised. The thicker it becomes, the more visually it stands out.


The apex of the teres major attaches to the opposite side of the apex of the pectoralis major.
pectoralis major
pectoralis major
Pectoralis major in women
The pectoralis major muscle forms the outer line of the body.
erector spinae in men and women
Unlike men, whose backs are curved due to the thickness of the spinal cord muscles,
The thickness of the spinal cord is thin, allowing for a flat flow.
I see it.
The overlapping area between the teres major and the latissimus dorsi creates a protruding flow.
Changes due to shoulder movement When the arm is extended to the rear as far as possible from a position with the arm forward, the upper trapezius muscle and the teres major muscle, which attach to the shoulder blade, contract as the shoulder blade is brought together toward the spine. The pectoralis major muscle follows along the arm extended backwards.
pectoralis major
등세모근
A border is created between the tibial band and the tendon of the biceps femoris.
The number 1 rib box undergoes slight deformation when the torso is twisted a lot. On the other hand, the shape of pelvic box 3 never changes.

■Position holding a baton (2)

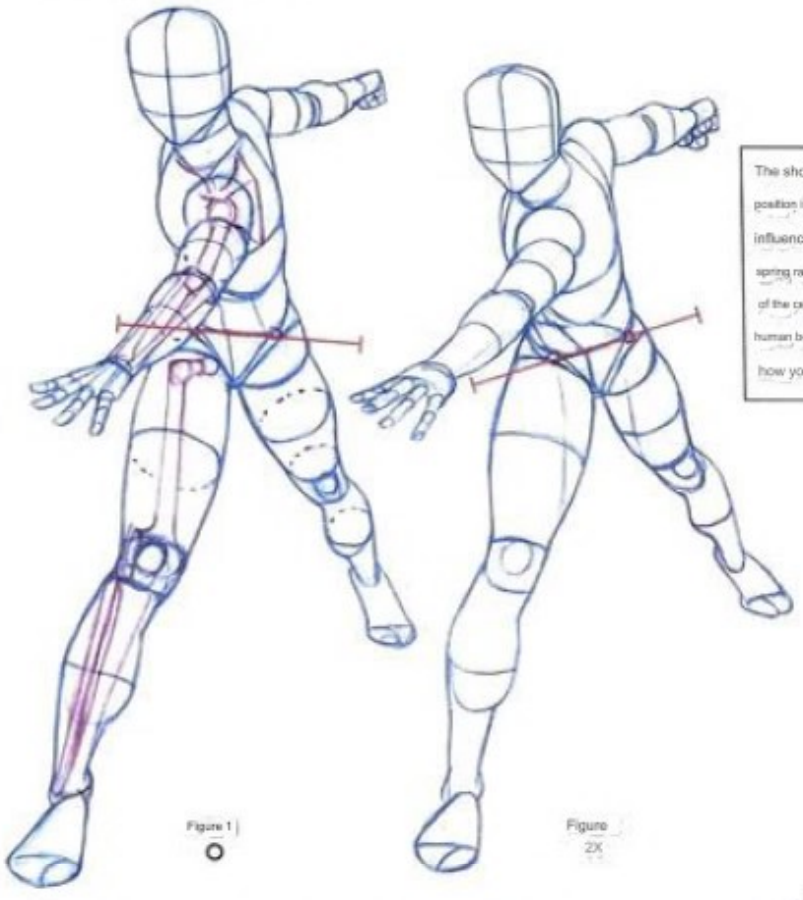


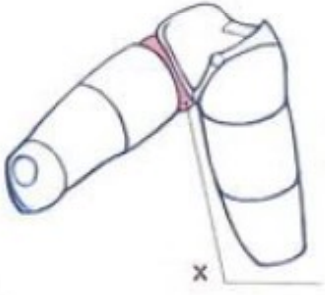
Figure 1

Figure 2X

The shoulder tilt in this position is a tilt created by the influence of the arm lifting the spring rather than the influence of the center of gravity. The flow of the human body changes depending on how you hold the object.

Limitations in range of motion that can cause the shoulders and pelvis to become distorted

Although there are differences depending on the degree of flexibility, the shoulders and pelvis can usually rotate up to 90 degrees, as shown in Figure 1. If you swing a heavy object, centrifugal force can momentarily twist it further as shown in Figure 2, but it is impossible to maintain this state.



Error due to expression of hard material If you think of the material of the figure as a hard material rather than skin, when the leg is bent, the space opens like the colored area.

The reason the knee is bent When attacking, the knee of the forward leg is bent in order to lean the body forward, and the knee that remains bent even after swinging the bar is to absorb kinetic energy.

Although the length of the pole is long, it is made of a lighter material than other objects, so the horse holding the pole can stretch to the side.

Because the arm holding the bar is pointed straight to the east, the back muscles, deltoid, quadriceps superior, and wrist flexors in that direction contract. It's a state.

▲Action for handling the baton There are two types of baton techniques: turning and striking. In order to turn the bar, you must hold the center of the bar, and since the posture in this picture is holding the lower part of the bar, you can see that it is not a movement to turn the bar, but a posture for hitting the opponent.

What is natural movement?

The weight of the body is more on the left leg, so the left pelvis should rise, but since the right leg is placed somewhere, the right pelvis rises. As such, existing theories change depending on the situation and are not absolute. Natural movements can be expressed only when various variables can be applied.

Incorrect pelvic flow in women ▲

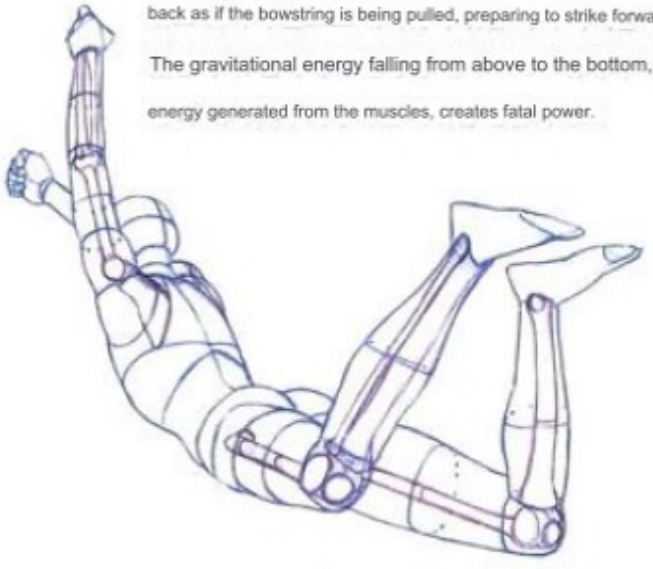
In women, the pelvis is widest near the greater protuberance of the femur. Sometimes, the iliac ridge is drawn as widest as possible, but this is incorrect. A woman's torso silhouette gradually becomes narrower from the shoulders down, and then widens again at the end of the ribs, resembling an hourglass. Compare it with the answer picture next to it.

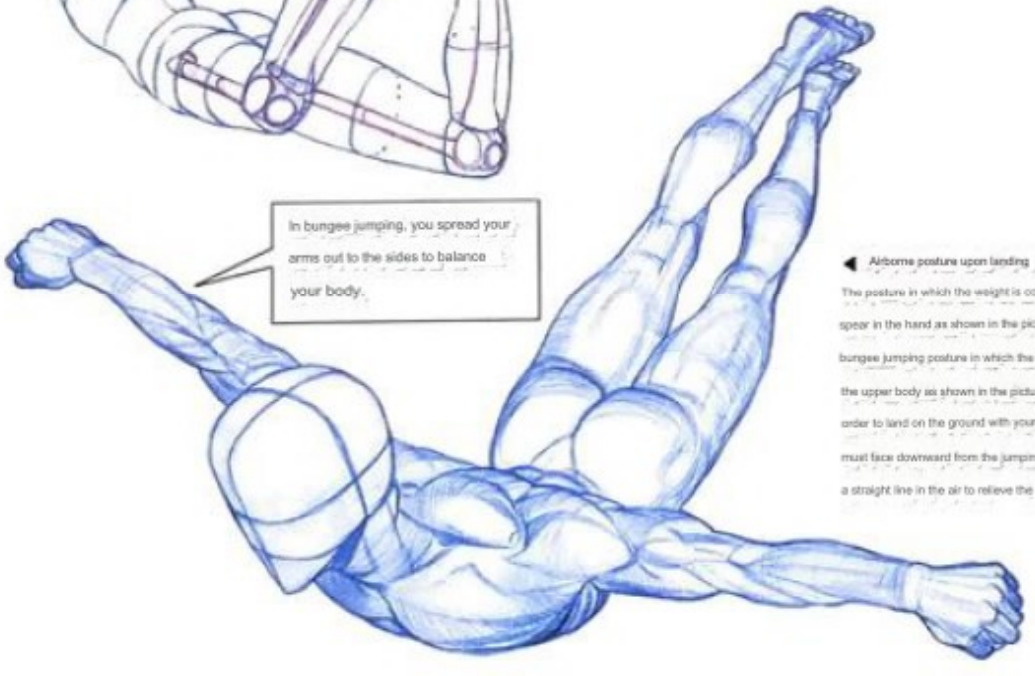
■ Falling posture while holding a spear

Ready to slam down stance

This is a stance in which you jump towards an enemy that is lower than you with a sharp spear and try to strike them down. The overall flow of the body is leaning back as if the bowstring is being pulled, preparing to strike forward.

The gravitational energy falling from above to the bottom, rather than the energy generated from the muscles, creates fatal power.

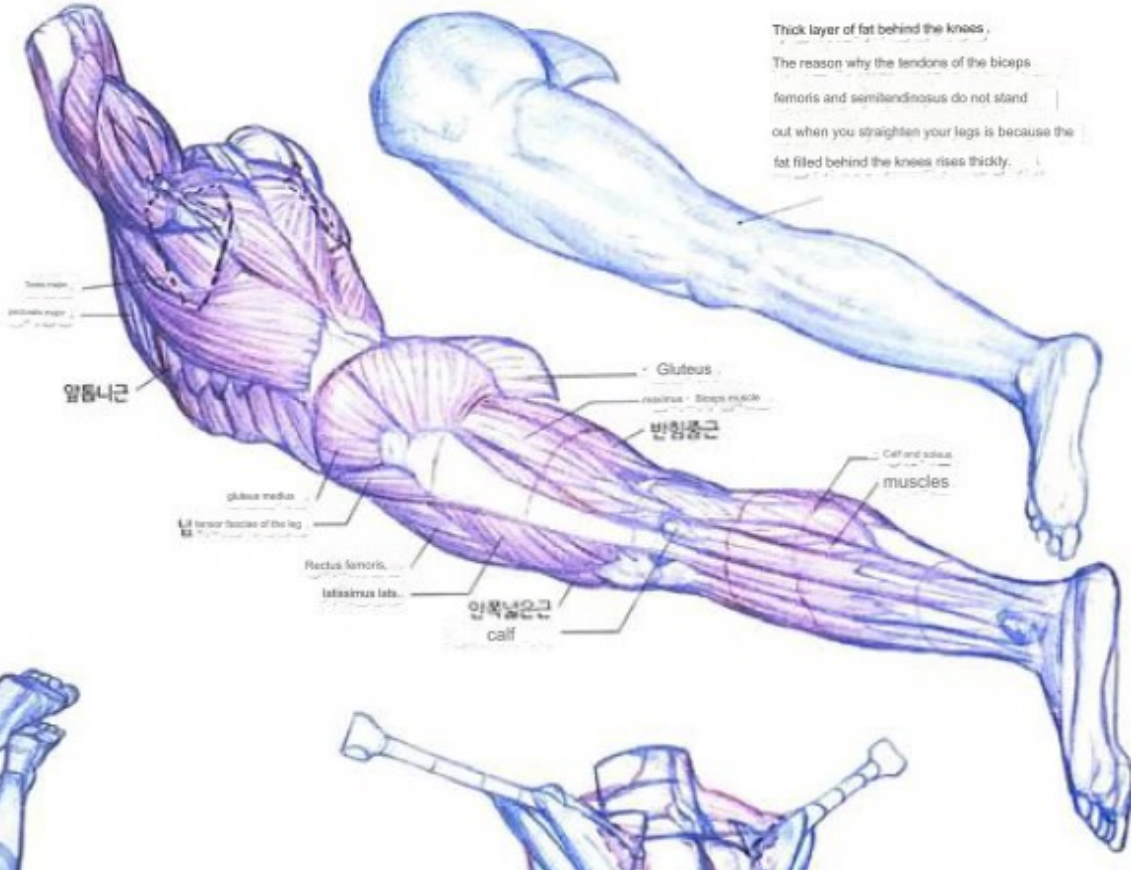




In bungee jumping, you spread your arms out to the sides to balance your body.

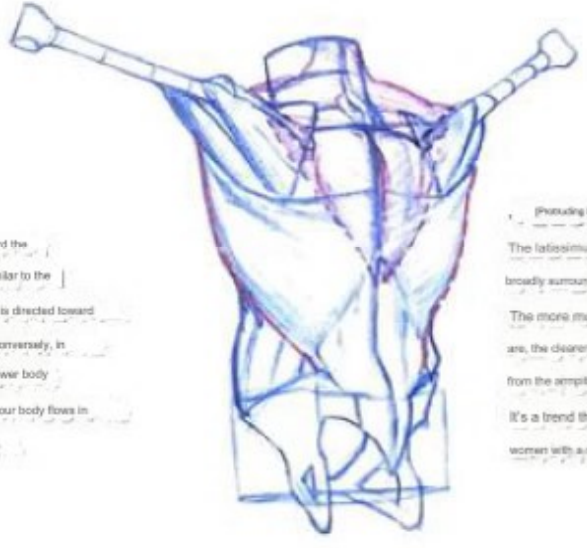
◀ Airborne posture upon landing

The posture in which the weight is concentrated toward the spear in the hand as shown in the picture above is similar to the bungee jumping posture in which the center of gravity is directed toward the upper body as shown in the picture on the side. Conversely, in order to land on the ground with your feet first, your lower body must face downward from the jumping position, and your body flows in a straight line in the air to relieve the shock of landing.



Thick layer of fat behind the knees

The reason why the tendons of the biceps femoris and semitendinosus do not stand out when you straighten your legs is because the fat filled behind the knees rises thickly.



(Protruding border of the large round root

The latissimus dorsi is shaped to broadly surround the entire back.

The more muscular you are, the clearer the muscle boundaries from the armpits to the sacrum become.

It's a trend that isn't evident in women with a normal body type.

Actions dealing with windows ▾

Spearmanship is an attack technique that uses straight thrusts with the aim of penetrating the opponent. There are two positions: holding a shield with one hand and holding a spear with the other hand, and holding a spear with both hands. Especially than the posture of stabbing a spear with both hands on the ground. As shown in this picture, the power of striking from the air is stronger.

Overhand stance ▾

Unlike a sword with a short handle, two-handed spearing involves holding the weapon at wide intervals. If you use the spear with both hands, carving is easier and the distance you can stab is longer. The picture below shows the spear in the 'overhand' position, where the spear is raised above the head and used as if slashing.

This posture is similar to the primitive fish hunting technique of jumping from a boat with a harpoon.

If you lift your arm at this angle, you will see the beak protrusion.

Contraction of the serratus alveolar muscle ▸ In the direction of the arrow, the serratus anterior muscle pulls the shoulder blade and helps raise the arm.

■ Tonfa attack stance

Features of Tonpa

Donpa is a weapon derived from the handle of a farming tool. It forms a guard on the outside of the arm, allowing it to strengthen bare-handed martial arts and at the same time swing at the enemy to inflict damage. Donpa can block the opponent's attacks like a shield, and since it has no blade, it can subdue the opponent without seriously injuring it.

It is also a weapon used by police for security.

Figure 1

Figure 2

Rigid flow of the upper body and unstable center of gravity

If the upper body is standing stiffly without twisting as shown in Figure 1, or if the center of gravity is tilted backward and unstable as shown in Figure 1, the dynamic feeling is reduced.

stable center of gravity

When bending your legs to lower your posture, do not pull your buttocks back like a duck's butt. Keep the tilt of your pelvis the same as when standing, tilt your upper body forward, and bend your knees to align your center of gravity.

Tonfa's attack method

Unlike weapons such as kendo or spear, donpa has an irregular pattern in which the direction of the attack changes depending on how it is held. It can be used in a variety of ways, such as using the protruding part in front of the handle to stab it, holding the handle like a nunchuck and swinging it to strike using centrifugal force, or using a joint to subdue it.

Women are usually

The hip ridge is not exposed, but if you twist your waist like this, the shape is revealed.

The tendon area of the latissimus dorsalis muscle, shown in green, is flat rather than curved, and appears flat on the outside.

• Analyzing posture

The side of the back, which is resistant to external shocks, faces forward, and the twisted body prepares to swing the tonfa, making it a posture that both defends and attacks.

Excessive muscle depiction

If you become absorbed in studying anatomy, you may easily make the mistake of expressing the anatomy information in the same way on the outside and drawing it as if it were a body without skin. When depicting muscles, rather than dividing the boundaries of all muscles, you should observe the parts where the flow is tied when seen from the outside and understand the action of contraction and relaxation that occurs depending on posture.

'Back view holding an axe'

The role of both arms

The picture you will learn this time shows a posture of threatening the opponent with an axe, with the left hand raising the guard to block an attack towards the face, and the right arm being held to the side to create a distance from which the ax 쭉 뻗고 can be swung.

Fixed shoulder▸

As shown in this picture, the shoulder blades should not be fixed and only the arms should be moved.

Shape changes due to muscle relaxation and contraction

▸ The more muscle mass a body has, the more its appearance changes depending on the state of muscle relaxation and contraction. In a relaxed state, the muscle flow appears tied together, but in a contracted state, the muscles separate from each other and the grains split in the direction of the tendons.

Characteristics of the axe ▸

The iron part of the ax is concentrated at the front so that a large centrifugal force can be exerted when swung. Because the weight of the blade is heavy, the power is strong, but the attack speed is low. Axes and maces, which have their center of gravity toward the end of the handle, are easier to attack than swords.

Characteristics of the spine

major muscle When the latiss

major muscle contracts, its volume

stands out compared to other muscles

Arm movement and latissimus dorsi

The light and dark in the relaxed latissimus dorsum on the left side when the arm is raised is the flow of the ribs, and the light and dark in the latissimus dorsum on the right side when the arm is pulled back is caused by the splitting of the tendons due to contraction.

Spinal processes and spinal

body If you think of the externally exposed spinal processes as the spinal body, your lower back will move at the wrong angle.

Remember the eastern spine of a fish with long spinal processes and clearly recognize the difference between spinal movements and spinal processes.

The right arm holding the ax is stretched out behind the back, so the right Seogeun is clearly divided into upper, middle, and lower parts.

Characteristics

위더엉덩뼈가시에

of women: A concave area appears. If you lean forward, it will disappear.

The upper iliac spine is concave behind the pelvis.

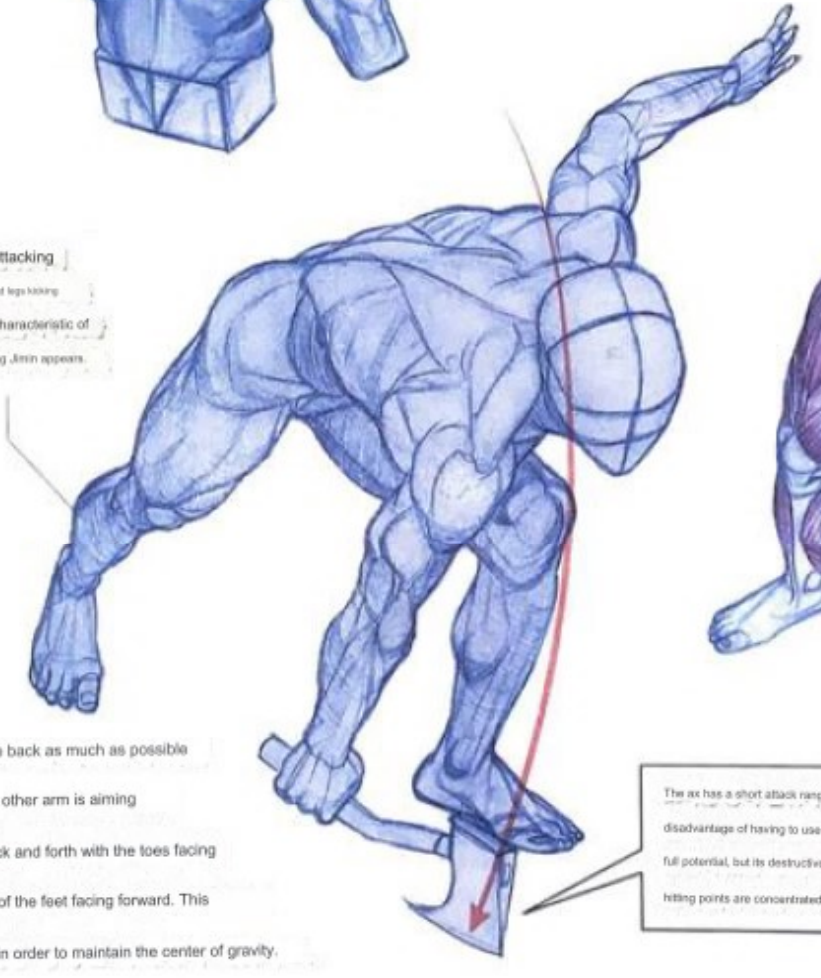
Dimples are like dimples that appear on the face; some people have them and some don't.

When viewed from behind in a pose like the picture on the side, the distance between the person and the camera is set close enough to produce excessive transparency, creating a strong feeling of impact.

■ Preparatory posture for striking with an axe

•Back muscles that emphasize masculinity

Of the back muscles that stand out as a sword, all but the erector spinae muscles are used for arm movements, so athletes who use their arms a lot have a highly developed back. Back muscles are also an important element that emphasizes masculinity.



In all forward-attacking movements with the hind legs kicking the ground, the characteristic of the hind feet spurring Jimin appears.

Direction of arms and legs facing

In the above posture, the right arm holding the ax is pulled towards the back as much as possible in order to strike the ax from top to bottom toward the target, while the other arm is aiming at the target and holding the center of gravity. The feet are spread back and forth with the toes facing to the side, and then change to a downward motion, with the direction of the feet facing forward. This is because the direction of the toes follows the direction of movement in order to maintain the center of gravity.

The ax has a short attack range, so it has the disadvantage of having to use the arm's range of motion to its full potential, but its destructive power is high because the hitting points are concentrated at one point.

Overlapping parts or
When drawing a
complex shape,
understand the structure
using simple shapes and
then create muscle flow
according to them.

◀ timing of inhalation
When exerting maximum
force, inhale and allow your body to
instantly increase the pressure.
Weightlifters use their
strength and breathe
•Exhale. This breathing method
when they are done.
It's used a lot.

Deku's attack style is one that
pushes forward with overwhelming force rather
than technique, making it a good fit
for a character with a big personality.

Downward stance that does not require rotational force •
The reason why the shoulders and pelvis do not
twist in this position is because the ax is swinging
from top to bottom rather than sideways, so no
rotational force from the torso is required.

The pectoralis major muscle is attached to a central point
along the line of the lateral superior articular prominence
of the tongue.

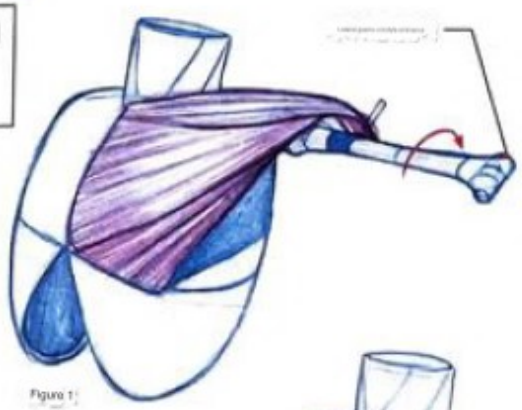


Figure 1

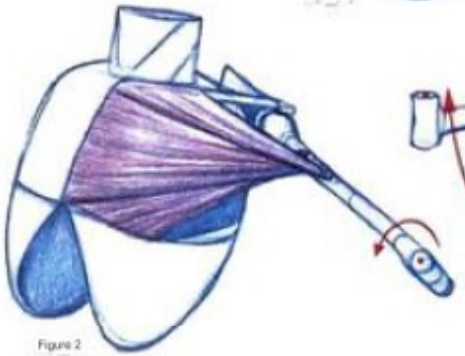


Figure 2

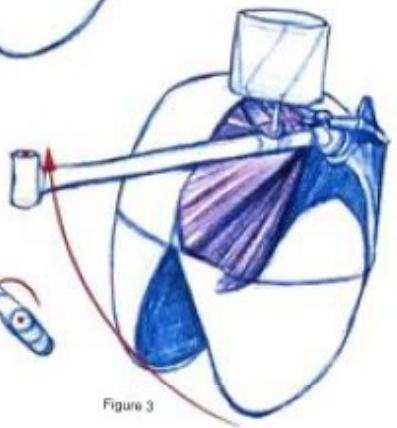


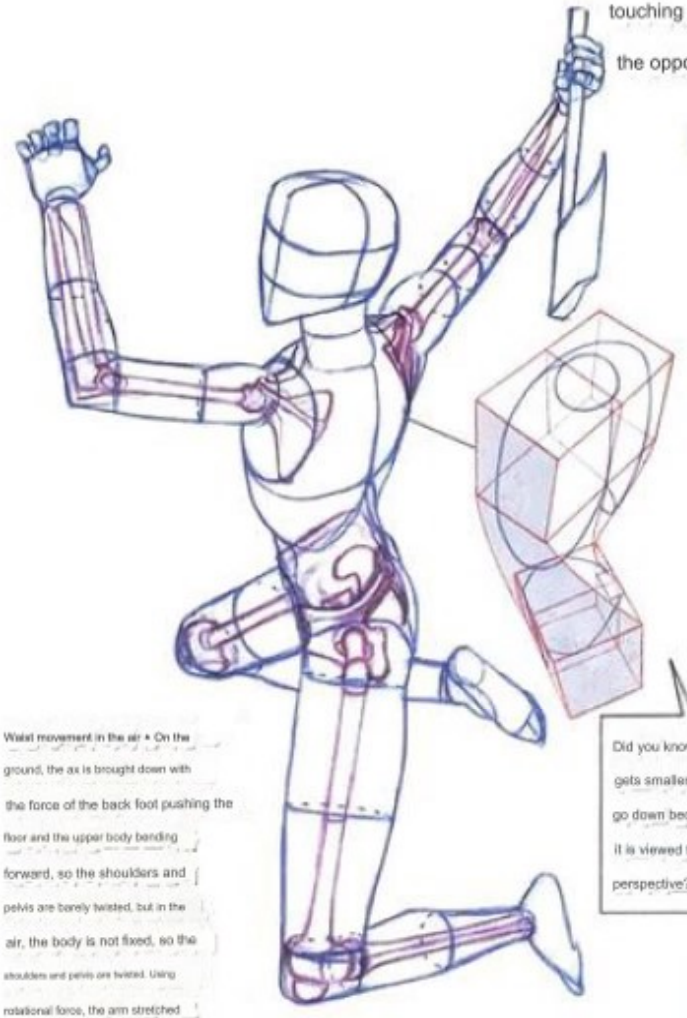
Figure 3

• Shape of the pectoralis major muscle according to arm movement
As shown in the picture, if you rotate backwards with your arms spread out to the sides, the end point of the pectoralis major muscle will also pass backwards along the lateral superior joint prominence line. As shown in Figure 2, when you rotate forward with your arms spread out to the sides, the end point of the pectoralis major muscle is twisted and pulled to the side. If you place your arms in front of you as shown in Figure 3, the distance between the starting point and the ending point becomes closer, causing the pectoralis major muscle to contract. The posture in the picture on the left, where the person is holding an ax, has the same arm movement as in Figure 1, so the pectoralis major muscle is turned backwards along with the deltoid muscle. This is also the position where the area of the pectoralis major muscle appears to be the widest.

■ Jumping and slashing with an axe

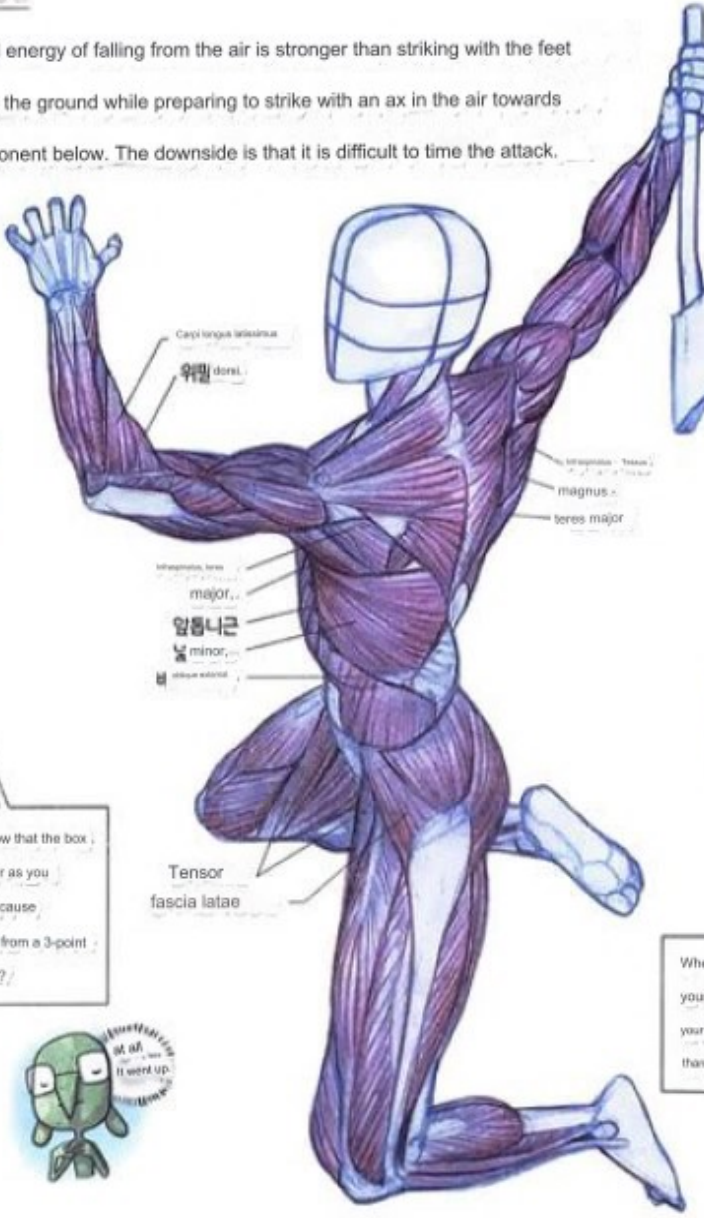
Advantages and disadvantages of shooting down from the air

The power of striking with the gravitational energy of falling from the air is stronger than striking with the feet touching the ground while preparing to strike with an ax in the air towards the opponent below. The downside is that it is difficult to time the attack.



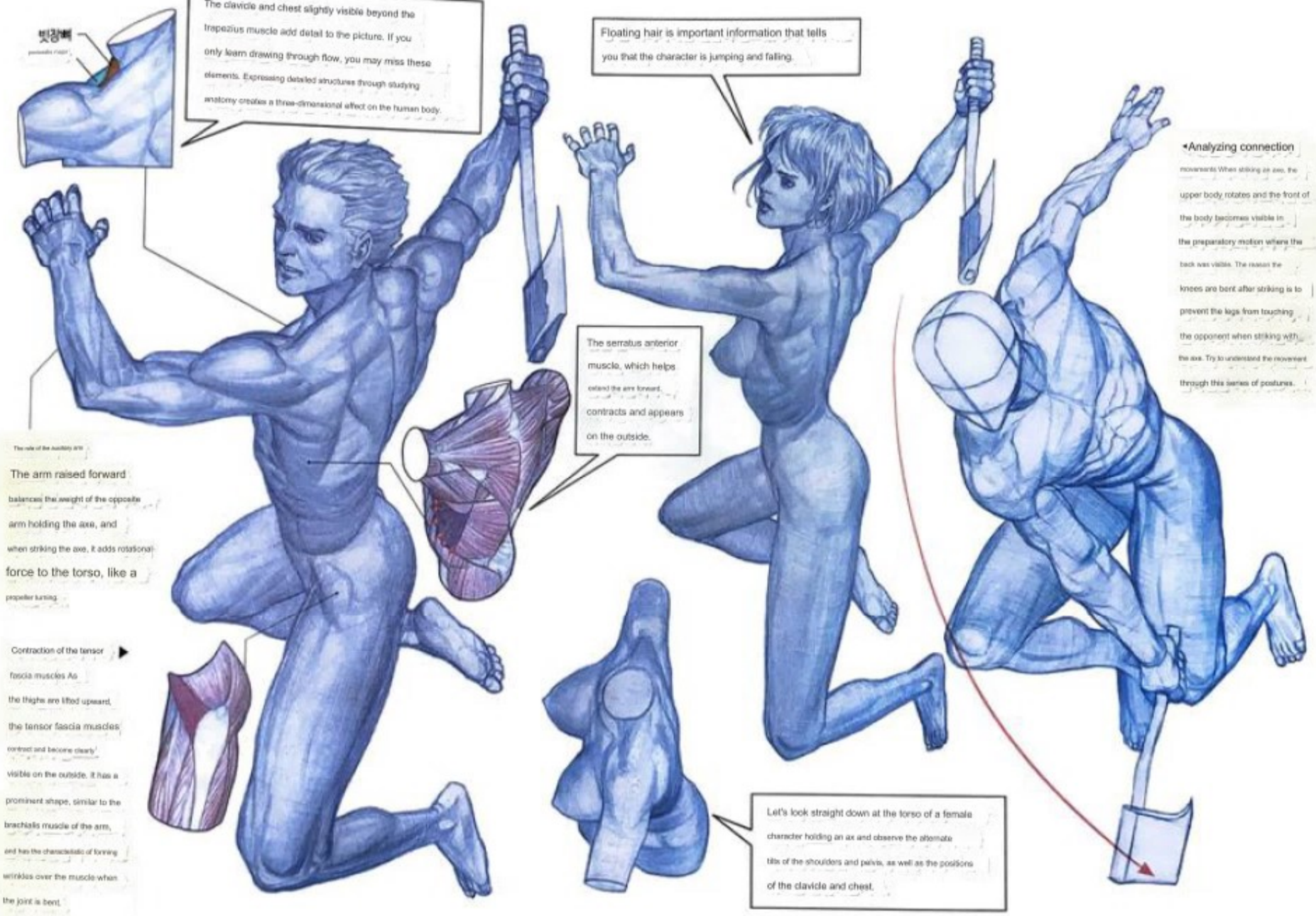
Waist movement in the air • On the ground, the ax is brought down with the force of the back foot pushing the floor and the upper body bending forward, so the shoulders and pelvis are barely twisted, but in the air, the body is not fixed, so the shoulders and pelvis are twisted. Using rotational force, the arm stretched back is pulled forward and the ax is struck down.

Did you know that the box gets smaller as you go down because it is viewed from a 3-point perspective?



It is a first-person perspective seen from the position of the person being attacked, and is often used to create impactful scenes in comics.

When you bend your legs in the air, your calves create an angle where your toes come together rather than an 11-line line.


The clavicle and chest slightly visible beyond the trapezius muscle add detail to the picture. If you only learn drawing through flow, you may miss these elements. Expressing detailed structures through studying anatomy creates a three-dimensional effect on the human body.
Floating hair is important information that tells you that the character is jumping and falling.
The serratus anterior muscle, which helps extend the arm forward, contracts and appears on the outside.
The arm raised forward balances the weight of the opposite arm holding the axe, and when striking the axe, it adds rotational force to the torso, like a propeller turning.
Contraction of the tensor fascia muscles As the thighs are lifted upward, the tensor fascia muscles contract and become clearly visible on the outside. It has a prominent shape, similar to the brachialis muscle of the arm, and has the characteristic of forming wrinkles over the muscle when the joint is bent.
Let's look straight down at the torso of a female character holding an ax and observe the alternate tilts of the shoulders and pelvis, as well as the positions of the clavicle and chest.
◂Analyzing connection
movements When striking an axe, the upper body rotates and the front of the body becomes visible in the preparatory motion where the back was visible. The reason the knees are bent after striking is to prevent the legs from touching the opponent when striking with the axe. Try to understand the movement through this series of postures.

■Position to lift the hammer

When lifting heavy objects

This is a posture in which you use your whole body to lift a heavy object that cannot be lifted with just your arm strength. In this pose, the strength of the lower body to bend and straighten the knees is the main force. In order to firmly grasp an object, the wrist flexors contract and the back muscles contract to pull the arm toward the back.

If the direction of pulling is forward, it can also be used as a tug-of-war posture.

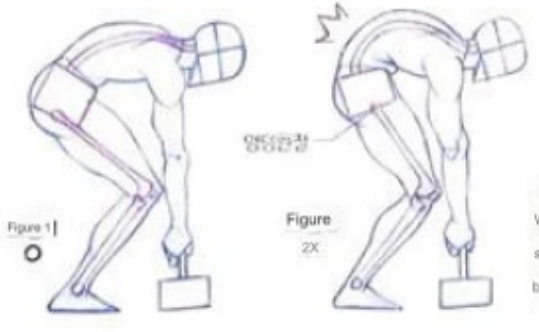


Figure 1

Figure

2X

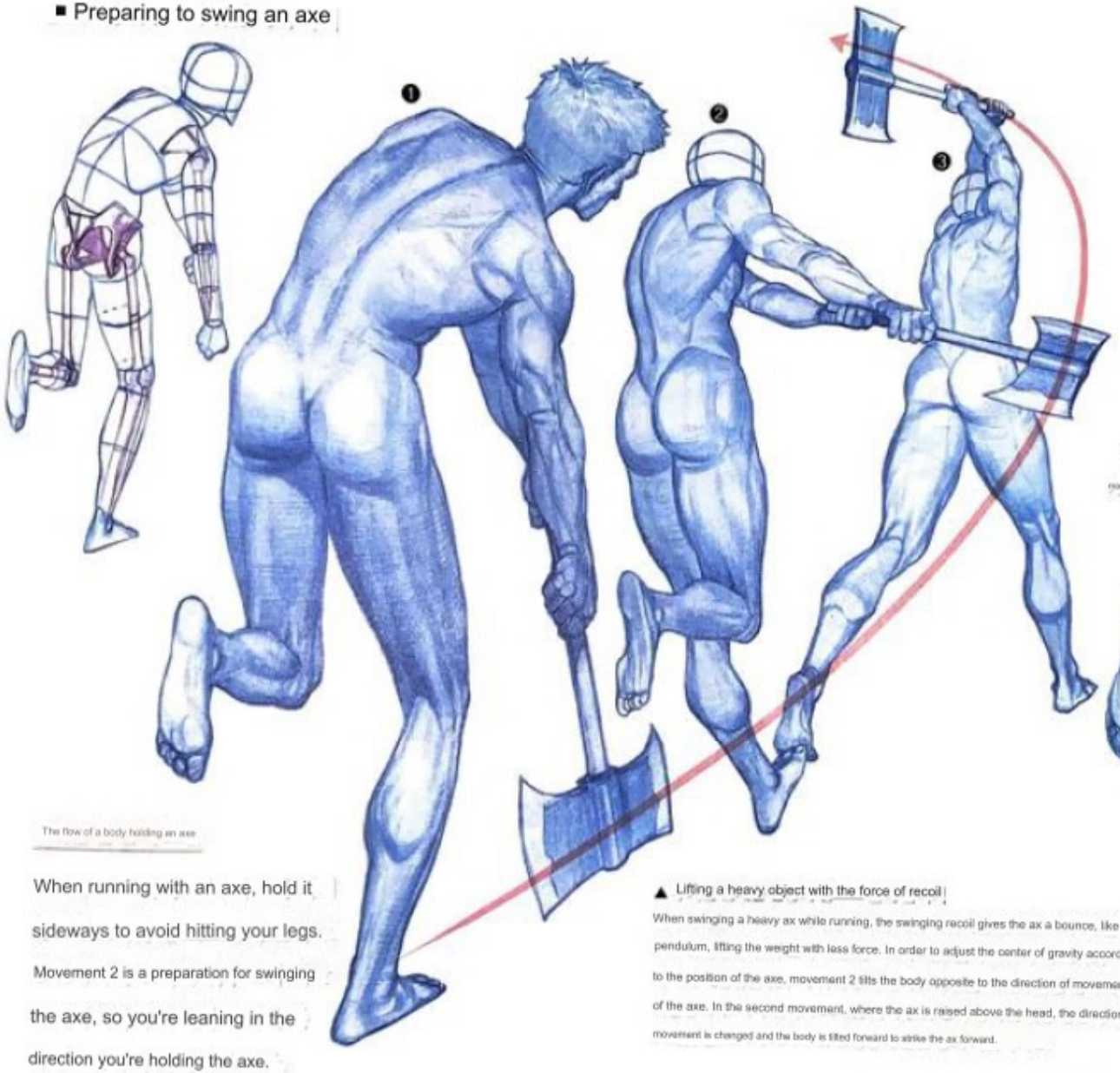
•Movement of the hip joint when bending the waist

When expressing this posture, be careful not to move your hip joints and bend your back forward as shown. Since a bundle of nerves passes through the lumbar vertebrae that connects the upper and lower body, the hip joint is used to minimize the movement of the lower back when bending over.

Maximum distance between shoulder blades

The position of the shoulder, which is stretched forward as far as possible by pulling something, goes beyond the range that can be moved with its own strength. The shoulder blades that are connected to the shoulders also move forward, so the distance between the shoulder blades becomes as far apart as possible.

■ Preparing to swing an axe



The flow of a body holding an axe

When running with an axe, hold it sideways to avoid hitting your legs. Movement 2 is a preparation for swinging the axe, so you're leaning in the direction you're holding the axe.

▲ Lifting a heavy object with the force of recoil

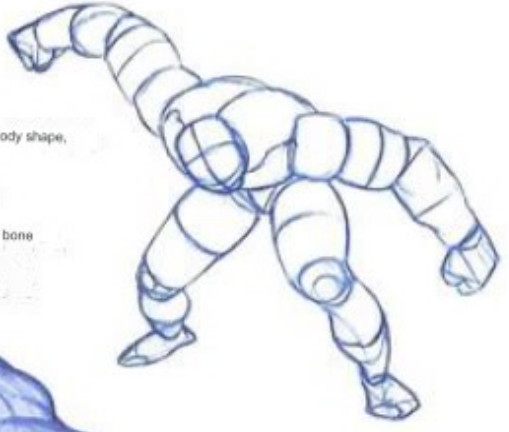
When swinging a heavy ax while running, the swinging recoil gives the ax a bounce, like a pendulum, lifting the weight with less force. In order to adjust the center of gravity according to the position of the axe, movement 2 tilts the body opposite to the direction of movement of the axe. In the second movement, where the ax is raised above the head, the direction of movement is changed and the body is tilted forward to strike the ax forward.

■ Muscular character holding a hammer

Maintaining muscular character proportions

When drawing a muscular character that deviates significantly from the basic body shape, it must be drawn in proportions that are different from regular shapes.

You need to make a difference not only in terms of volume, but also in terms of bone structure. After learning the basic bone structure, you should practice the bone structure and volume of various body types based on this.



Characters that do not need weapons>

Large, muscular characters are the type that always appear in action genre games or comics because their appearance alone gives a more threatening feeling than any weapon. The characteristic of posture is that the body is leaning forward, so the back and chest are affected. The shoulder muscles are visible at the same time, emphasizing the enormous thickness. The split muscles and veins add to the feeling of strength.

How to draw muscular characters well?

Drawing a muscular character requires a lot of knowledge, including anatomy, the center of gravity for a large body, and the location of major blood vessels. Rather than drawing from imagination, you can design a structurally convincing character by studying the shape by looking at data on actual muscular body types, such as bodybuilders, and applying deformation based on this.

If a large, muscular character uses a weapon, a bulky weapon such as a greatsword, axe, or warhammer that matches his strength is suitable. On this page, a downward posture is expressed in heavy language.

Position of the hand holding the handle

As mentioned earlier, in the picture, the weight of the object is determined by the posture of the character holding the object. In the pose shown in this picture, the position of the hand holding the warhammer is the most important factor in conveying the sense of weight. Instead of holding the end of the handle with both hands, one hand holds the head of the warhammer, creating a posture that allows you to effectively lift heavy objects. This increases the accuracy of aiming at the target when striking or swinging the weapon, and maintains a stable posture. You can take it.

wrinkles on bent arms

The brachioradialis muscle and the brachioradialis longus muscle are bundled into one mass, and when the arm is bent, the wrinkles rise up the brachialis muscle. As muscles develop, the direction of wrinkles increases.

If a character in a normal experience is holding a large warhammer, he or she appears unable to lift the hammer or the warhammer feels light. In comics, strong characters are expressed in this way.

■ Holding a gun

Shoulder tilt as seen from intuition>

Depending on the type of gun, type of ammunition, and purpose of shooting, the posture in which you hold and aim the gun and the way you hold the gun vary greatly. If you look at the posture on this page from a straight perspective, you can see that the shoulder on the side holding the gun is pulled back and the shoulder tilted forward on the arm holding the gun.

The perspective of the legs stretched out in front adds a sense of depth to the screen. Observe the shortened length and cross-section through a simple diagram of the structure.

Creating a three-dimensional posture

Because it is difficult to create a three-dimensional effect when the figure is facing forward, one leg is stretched out to give a sense of depth, and the other leg is bent inward with the knee brought in to emphasize a feminine gesture. There is also a grip method where both hands are stretched out equally to hold the gun, but to avoid the monotony caused by symmetry, one arm is bent and held underneath the gun. Since hair is the only element of the body that allows the movement of the body and the direction of the wind to be felt, fluttering hair is expressed to create a dynamic feeling. If the hair is fixed, it becomes motionless.

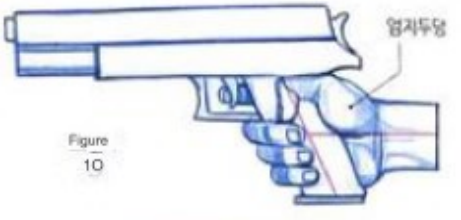


Figure 10

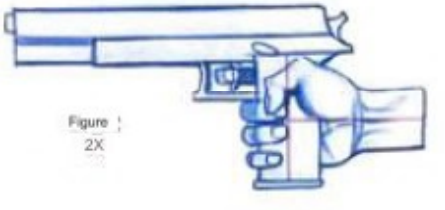


Figure 2X

The handle of the gun tilted diagonally ▲

The handle of the gun has a diagonal shape that matches the angle tilted by the thumb. If the handle is vertical, it takes strength in your hand to hold the gun horizontally, creating an uncomfortable posture.

kneeling posture ▶

When shooting with a rifle, place the bottom of the stock against your shoulder and position your face so that you can aim naturally by absorbing recoil from the top of the stock. It can be said that the kneeling posture is a shooting posture with a higher accuracy rate than the standing posture because the lower body is firmly fixed to the ground. However, since it is more difficult to move while shooting than the standing shooting posture, it is difficult to react to the opponent's attack, so this posture is often used when attacking with a group rather than alone. Or, it is a posture used in a space where cover is possible. The prone position, which has the highest accuracy rate among shooting positions, has both arms holding the gun fixed to the ground, which reduces recoil when shooting, and allows you to hide from enemy attacks, making it possible to hide. The downside is that it is slow to react to attacks coming from the air.

• Shooting posture in creative works

Not all shooting postures seen in cartoons or movies are based on realistic theories. Trying to express the shooting posture within a too realistic range can become an obstacle to creative storytelling. Unless you are in a professional action genre related to guns, as long as you have the basic shooting motions of straightening your arms and holding the pistol at eye level, you can try various movements depending on the story or direction. This creates creative scenes.

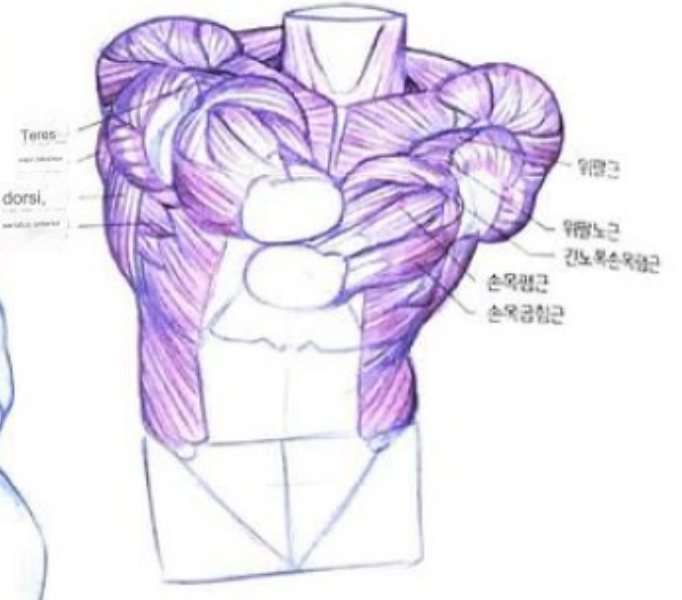
Impromptu shooting posture•

It seems similar to the prone position, but since you are not holding the dance with both hands, it is not classified as a prone position. It is used to create a sense of urgency and speed by assuming a situation where the pistol is suddenly drawn, giving up the correct aim and only controlling the shooting direction with one hand.

- Position with both arms and one knee extended forward

Focus on the big flow, draw a shortened posture

Both pictures show the same posture viewed from different angles. In the picture on the left, shortening occurs in the arms and bent legs, and in contrast, in the picture on the right, shortening occurs in the entire body except for the arms and bent legs. When drawing a foreshortened posture, drawing it in parts starting from the part closest to it will help improve the overall flow. The chances of the ratio being wrong increases. Therefore, we need to understand the structure in the order it extends from the body and control the main flow first. Instead of focusing on small units such as the detailed flow of muscles, try practicing broadening your perspective through diagramming.



■ Various postures with shortening applied

Overlapping and shortening with good cost-effectiveness> This is a posture in which overlapping and shortening are applied only to the arms. The point is to draw both arms in the same posture so that they overlap and foreshorten, but still feel symmetrical with the opposite arm. Even if this simple posture is only partially overlapped or shortened, the difference in depth of the picture increases.

Point of posture that takes priority over shortening

• This is the posture of sitting against a wall.

His bent legs are keeping his body from slipping, and his arms are behind his head, supporting his hands as pillows. The upper body is standing and the lower body is lying down, so the waist is bent forward. Foreshortening occurs with outstretched legs and hands placed on thighs.

Guroshi where shortening phenomenon is maximized ▲

Sitting with one leg raised somewhere, the chair is omitted so the lower thighs are visible. It is a low angle where the eye level is located at the soles of the feet, and the distance between the person and the camera is short, resulting in a large difference in the size of the feet closest to the camera and the size of the face farthest from the camera.

■ posture of swimming in water

A posture that emphasizes the flow of women

women's flexible movements

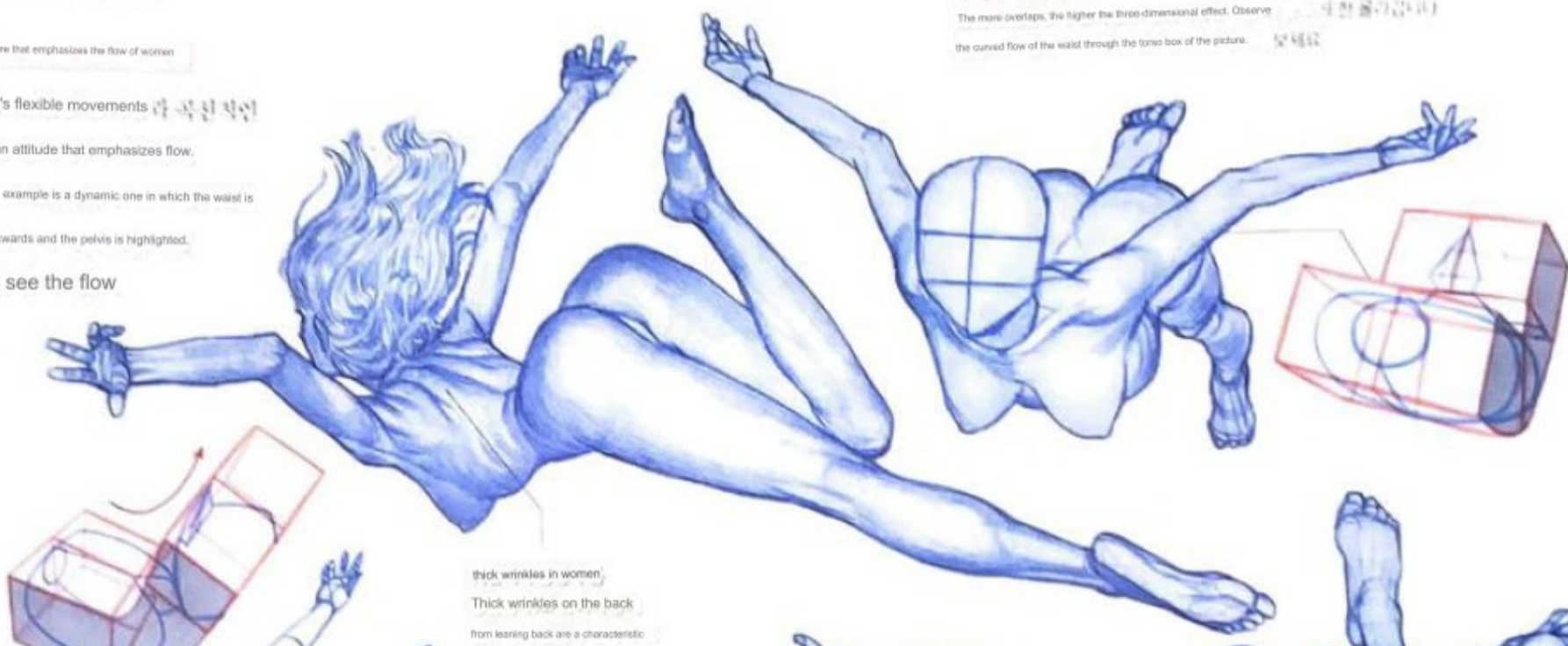
This is an attitude that emphasizes flow.

A typical example is a dynamic one in which the waist is bent backwards and the pelvis is highlighted.

I can see the flow

Drawing through transparency */

The more overlaps, the higher the three-dimensional effect. Observe the curved flow of the waist through the torso box of the picture.

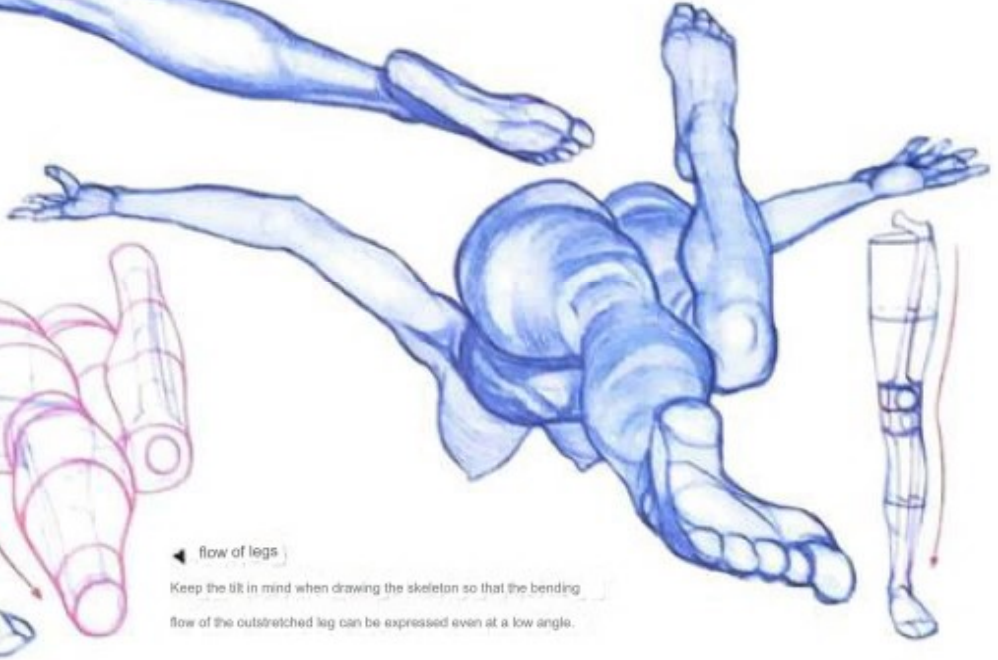


thick wrinkles in women

Thick wrinkles on the back from leaning back are a characteristic that mainly appears in women.

◀ flow of legs

Keep the tilt in mind when drawing the skeleton so that the bending flow of the outstretched leg can be expressed even at a low angle.



■ Dancer's posture

Draw in reverse order

If you draw from the part closest to the screen, Hidden parts are omitted, resulting in poor structure. If you draw with the body as the center, you can draw even the parts that are hidden and not visible, creating a solid structure. For example, when drawing a shortened arm, draw it in the order 'shoulder-elbow-wrist-hand'.

Understanding the structure through penetration • If you look at a figure, the upper body is hidden by the pelvis and is not visible, but let's look at the structure through the torso box, which is visible through penetration.

Drawing characters from various genres

No matter how well you season your food, it won't taste good if the ingredients aren't fresh. Likewise, no matter how original the concept is, if the human body of the character wearing the item falls apart, the overall quality of the picture will look poor. Like this, attempting deformation and adding multiple studying the human body has not yet been done properly is an inappropriate study method. In addition, 'creation' is not about creating a design that not exist before CLO, but rather about creating a new feeling by recombining existing elements, so in order to draw these existing elements well, you need to practice 'imitation' before creating. Humans observe more closely when looking at humans of the same species than when looking at other objects, and similarly when drawing humans, they exercise more detailed observation skills. Therefore, studying the human body is the most effective way to practice drawing to develop observation skills rather than practicing by looking at objects other than humans. Once you reach a level where you can express the structure of the human body using these principles, you will be able to draw objects other than the human body with relative ease. In Chapter 1, we discussed the proportions and volume of the human body through geometry. We learned the operating principles of joints, and in Chapters 2 and 3, we studied anatomy to learn about the principles and structures of muscles and to embody the flow of the human body. In Chapter 4, we looked at various trends to see how this information is actually applied. In Chapter 5, the last unit, we will learn how to express characters in various genres, such as superheroes, fantasy world races, armor and mechanics, based on human anatomy. We will also study how to find and apply large flows and patterns in complex and colorful action compositions through illustrations.

What is creation?

Ana decided to have a meeting with the editor.

I am full of anticipation.

But the reality was harsh.

The next morning. Ana leaves the house and Rock Hoesaeng appears from the pencil sharpener like a snail.

돼자먹 Rock sacrifice edits something in the drawing.

After some time, Ana tries again.

Oh my...is this déjà vu?!

The picture that received the editor's review is

It was something Rock Hee-saeng took care of.

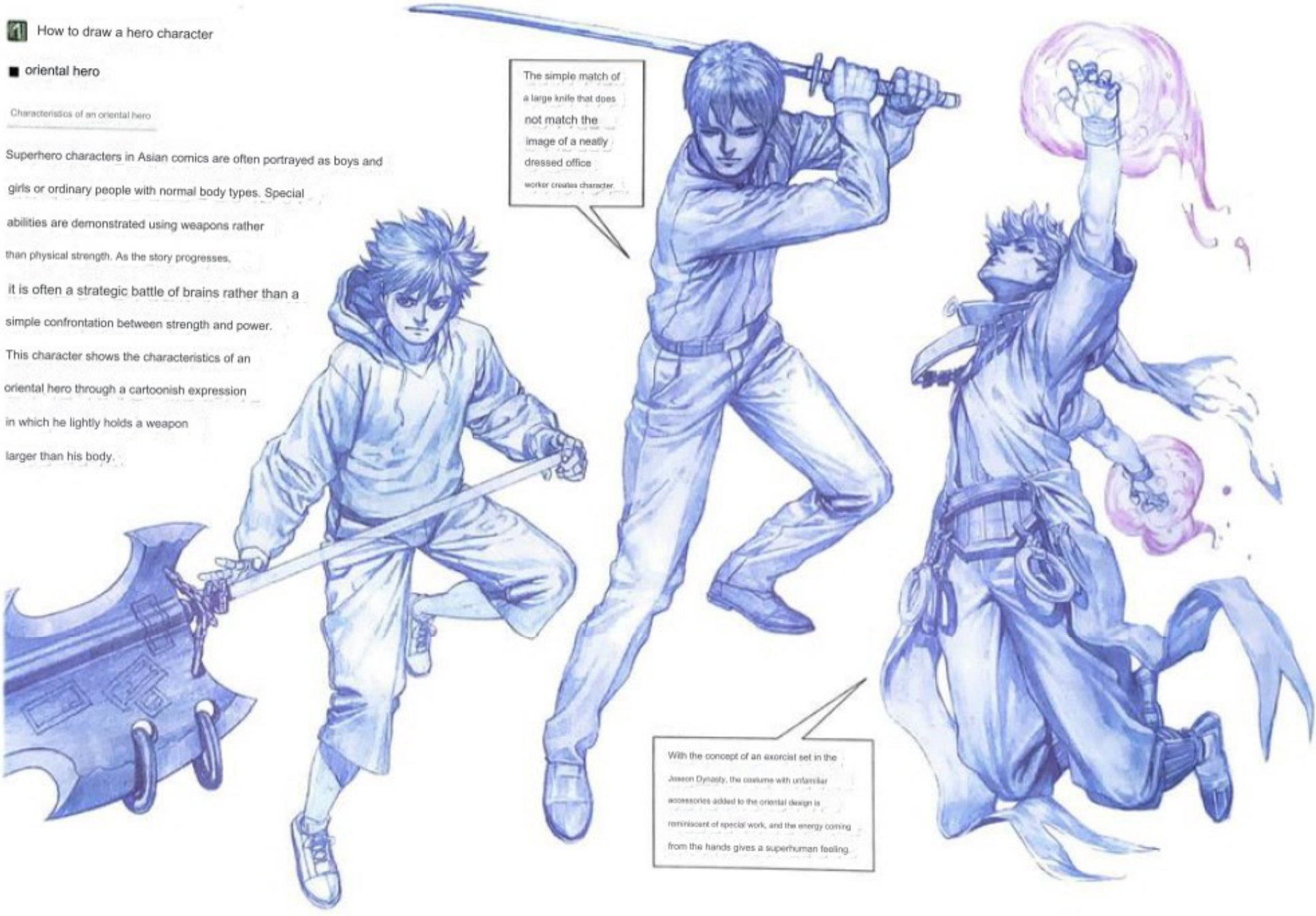
Ana came to a great realization.

■ oriental hero

Characteristics of an oriental hero

Superhero characters in Asian comics are often portrayed as boys and girls or ordinary people with normal body types. Special abilities are demonstrated using weapons rather than physical strength. As the story progresses, it is often a strategic battle of brains rather than a simple confrontation between strength and power.

This character shows the characteristics of an oriental hero through a cartoonish expression in which he lightly holds a weapon larger than his body.



Characteristics of American superhero comics

D superheroes in American comics, which the West, generally have muscular bodies and wear costumes made of spandex. As a result, the silhouette of the human body is clearly visible on the outside, and dynamic production focusing on movement is used to emphasize the flow of the human body. It's used a lot. Most characters wear masks and convey emotions or messages through gestures rather than facial expressions. The story has a clear structure of good and evil, creating a clear dichotomous confrontation structure.

Superhero Experience

Villain Experience

The character created by Dongse

If you look at the dynamic aerial combat that the characters engage in on the left page, you can see that the characters are performing actions that feel like they are performing artistic gymnastics. In this way, expressing various characters through the movements of the characters can be seen as a characteristic of American superhero comics. A basic understanding of the human body is essential to draw dynamic movements as shown in the picture below.

Differences between the experiences of heroes and villains

If the main character's physical abilities are too great, the story may become simplistic, so most superheroes who become the main characters tend to be close to ordinary people. On the other hand, villains emphasize their strength rather than their brains, so they are usually drawn as deformed, muscular characters. As shown in the picture above, characters with huge muscles have a character whose movements are closer to that of a gorilla than a human due to the weight of the muscles.

antihero body type

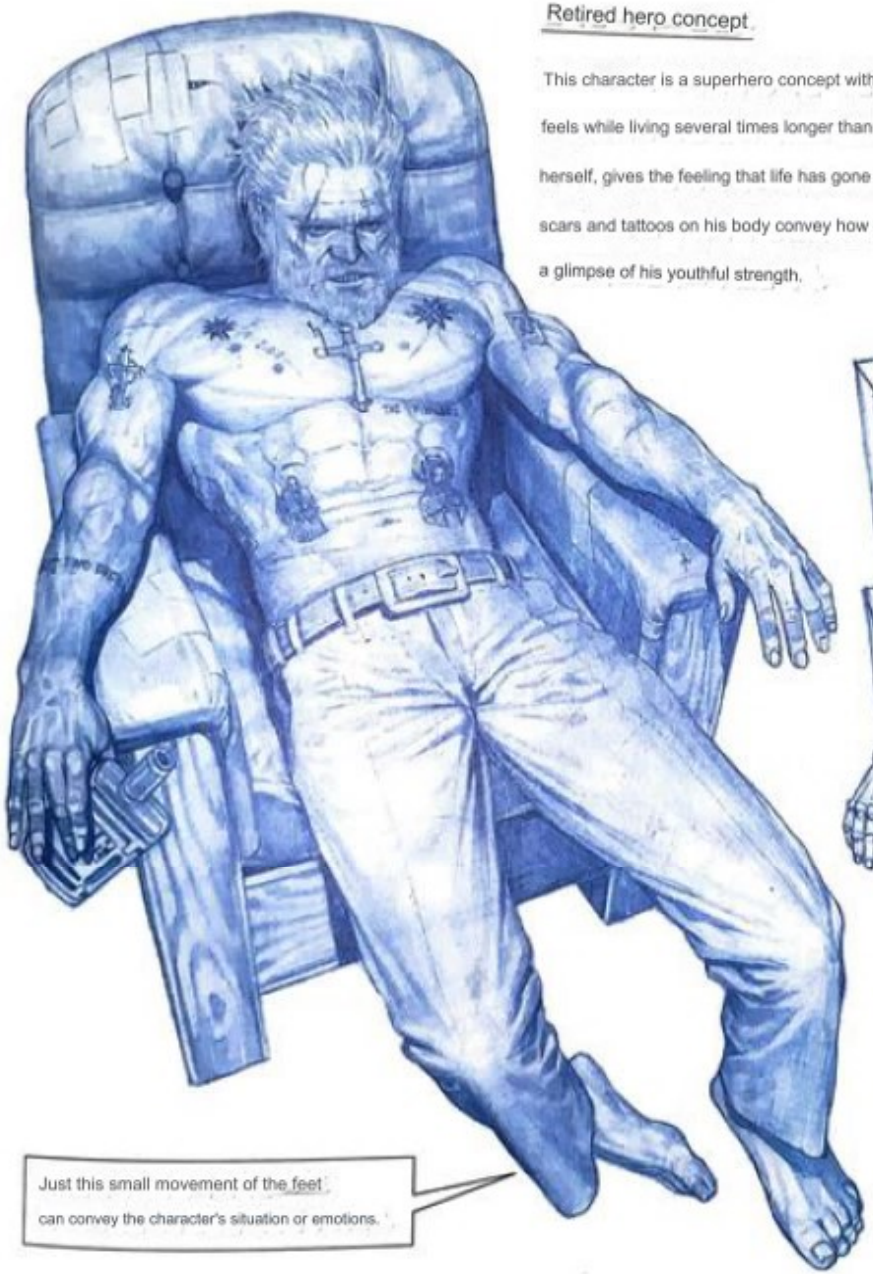
Antihero with a blurred line between hero and villain>

This character's muscles are somewhere between the two pictures above.

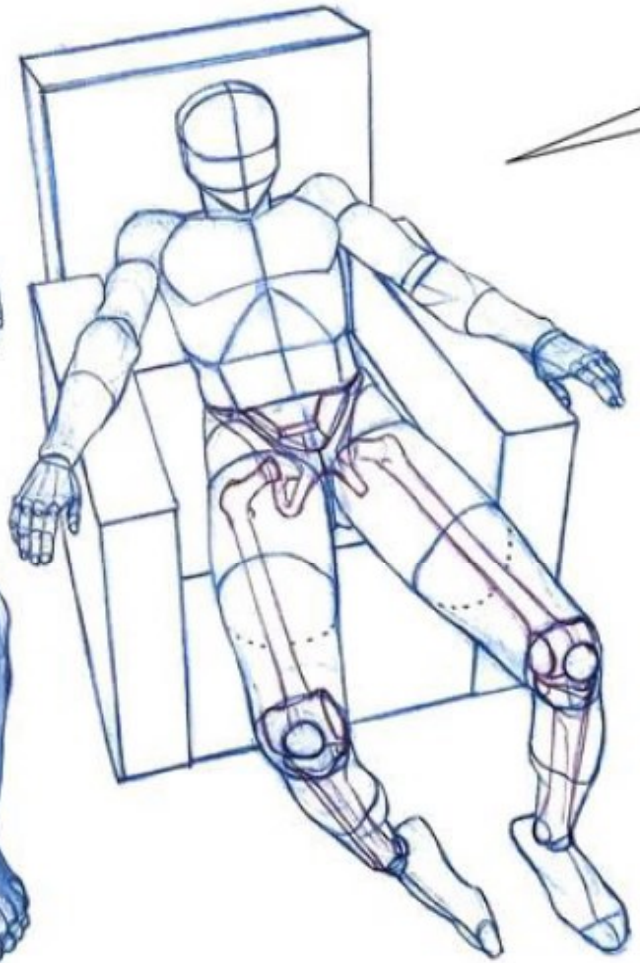
It is often used in roles that go back and forth between hero and valiant, and it helps to avoid a story that has become too simplistic with an excessive good/evil structure. In modern times, as the line between heroes and superheroes becomes blurred, dual superheroes like this are becoming more popular.

Retired hero concept

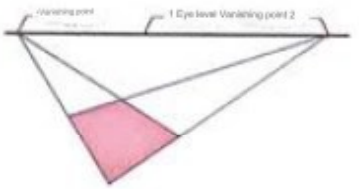
This character is a superhero concept with self-healing abilities, and he uses alcohol to soothe the weight of life he feels while living several times longer than the average person. Dong-se, sprawled out on a sofa as worn out as herself, gives the feeling that life has gone beyond boredom and has reached a state of giving up. The many scars and tattoos on his body convey how difficult his past life was, and his facial expressions were intended to give a glimpse of his youthful strength.



Just this small movement of the feet can convey the character's situation or emotions.



Which should you draw first, the sofa or the figure? You need to draw the sofa first, which is larger than the person. If you think about it simply, it's because a character can't sit down without a sofa. You can understand the space through the sofa, and you can control the character's movement based on the tilt of the backrest or the spacing of the armrests.

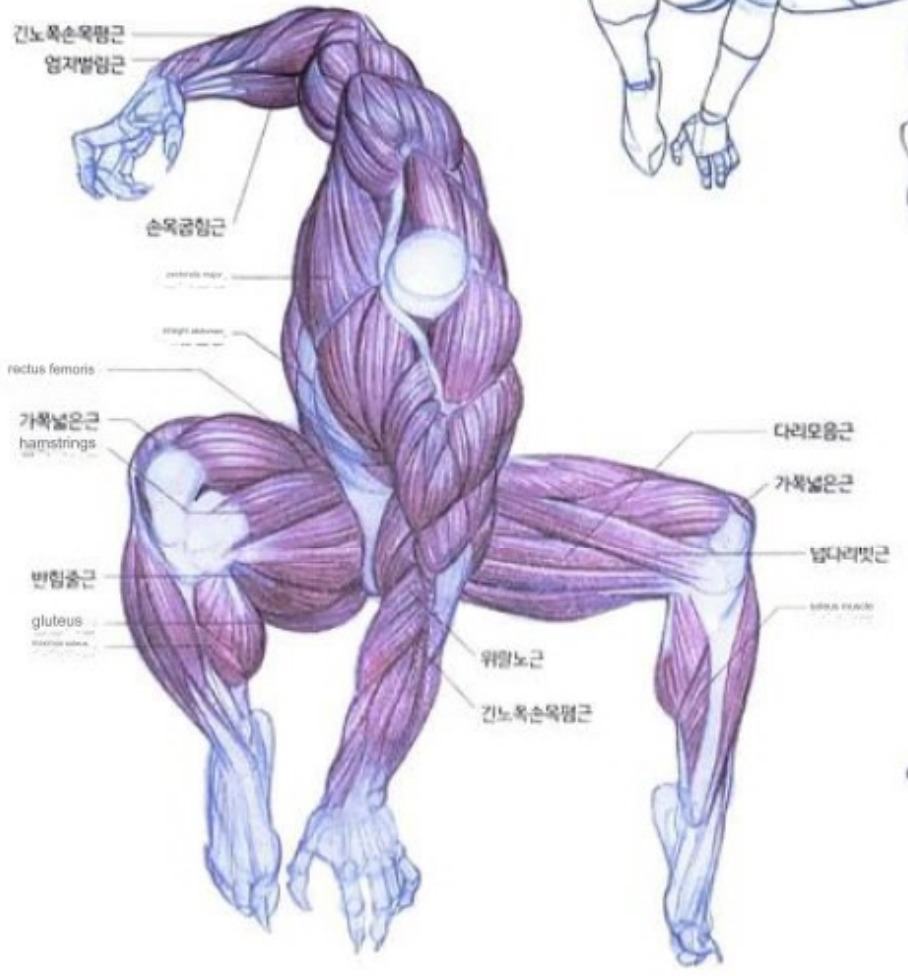


▲ Setting up space

Even if you draw a single person or object It is important to set the eye level and draw perspective lines. Just like a painting, perspective is needed when drawing a sofa.

Heavyweight muscular body type that appears in superhero movies

As I said before, to draw American superhero characters well, you need to have a good knowledge of the human body. Additionally, most characters have muscular bodies, so understanding muscles in the human body is essential. This time, we will compare and observe images of a heavyweight muscular body type and a normal body type.



How to Study the Heavyweight Muscle Model

The reason why it is difficult to study muscles by looking at photos of actual heavyweight muscle models is because the shape of the muscles is different for each model. For each love, the ratio between strength and strength is different, and the degree of muscle development is also different, so the appearance of the muscles is different. On the other hand, there is little difference between the starting and ending points of the muscle. Studying the heavyweight muscles will be much easier if you know where the differences occur and where the areas remain the same. With this in mind, a more convincing human body is created when a normal experience is deformed into the body of a muscular anti-hero character.

Three characteristics of a heavyweight body type with a lot of muscle mass

First, the border between tendons and sinews becomes clearer. Increasing muscle mass means increasing the volume of the tendon rather than the tendon, so the boundary between the two areas becomes more distinct with a noticeable difference. Second, the cracks in the tendons increase. In a normal body type, splitting of tendons occurs around contracted muscles, but as muscle mass increases, splitting can be observed even in relaxed muscles. Third, the hands and feet become enlarged and the veins become more prominent. The characteristic of enlarged hands and feet is a phenomenon that is mainly seen in heavyweight bodybuilders, and the prominent veins are a phenomenon that occurs as the body's basal metabolic rate increases as muscle mass increases.

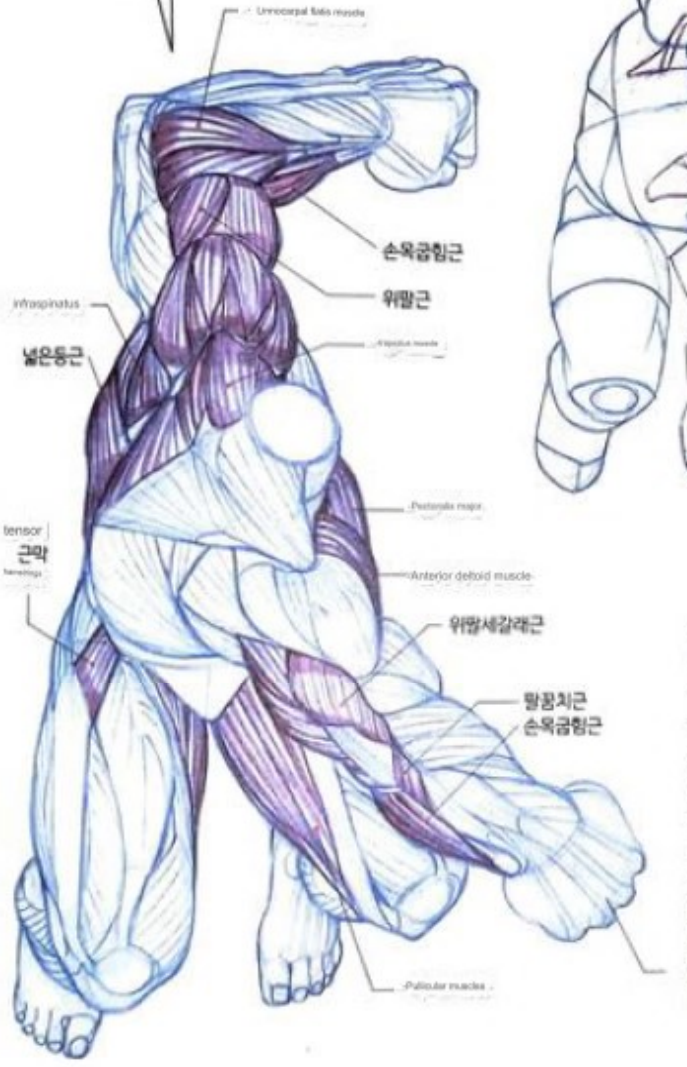
Analysis of antihero characters being attacked ▾

The character being attacked was designed to reflect the feeling of being closer to a monster than the character making the attack. The sight of tentacles waving from the face being punched adds to the extraterrestrial feel. When you only look at the large flow of the picture, the offense-defense relationship seems clear, but if you observe a partial image, you can see that it is the opposite situation. The hand movements and tense muscles of a character being attacked show that he or she is making a gesture to counterattack even while being punched. Also, in contrast to the desperate expression of the attacking character, the smiling expression of the character being attacked suggests that he is not taking any damage from the attack, giving a relaxed feeling as if he is receiving the attack.

Analysis of attacking antihero characters ▾

Antiheroes are usually created with a deformation based on the heavyweight muscular body type. Rather than using superpowers in action scenes, the emphasis is on physical strength to show the physical clash of strength and power. The fist of the character making the attack is designed to be large, maximizing the power of the punch, and the angle of both arms showing an electric line effectively shows the direction of the force. Additionally, the attack direction and fall direction are the same, allowing the viewer to feel the weight of the punch. The opposite fist is in a position of preparation for the next punch, implying that the attack is a series of unfinished moments. It can be said that anatomically elaborate muscle depictions are the most important feature that creates realism in American superhero films.

The red areas show the muscles contracting in this position. Conversely, muscles in areas that are not red indicate a relaxed state.



◀ Graphic drawing of a deformed character

A deformed character will deviate from the normal experience from the time the skeleton is drawn. You may think that it will be easier to draw than a regular body type, but since it is a body type that is not seen in everyday life, it is not easy to predict the movement that matches the proportions of the skeleton and the center of gravity. After drawing the skeleton, just draw the volume while thinking about the overall flow of the human body in the same order as drawing a general body shape.

Deformation based on anatomy The antihero character on the left represents a body type in which new muscles that do not exist in the normal human body are created or existing muscles are not omitted during the deformation process. Since this is a character whose size and muscle volume have increased from the normal body type, compare it to the normal experience and observe how the shape of the muscles has changed.

■ Various villain concepts

Antihero vs Villain

The two characters are fierce

In a hand-to-hand combat scene, the villain tries to subdue the anti-hero by wrapping his tentacles around him, but the anti-hero fights back with his strength. By placing the two characters upside down, we wanted to bring some fun to a composition that could otherwise seem monotonous.


The characteristics of crustacean insects were applied to the tail, and the background was set high up, taking advantage of the insect's ability to climb anywhere. The character's movement and overall silhouette were designed to be reminiscent of a scorpion.
It is a character created by combining the materials of reptiles and devils, and the thorns that protrude along the spinal processes highlight the concept. The image of the character sitting with his long tail wrapped around a cross would also be directed to evoke images of reptiles and the devil.
The concept of a monster with an oriental feel was expressed through props such as horns on the forehead, jeogori, and Gombangdae amulet. The directing of something sitting on a sealed box and guarding it makes you imagine various stories.

■ Beast people

The beast people are a race that combines animal tails, wings, and legs with those of humans. They originated in Eastern and Western mythology and are often used in fantasy novels and games. A convincing character can only be created with knowledge of animal anatomy.

◂Observe wing structure

As shown in the picture on the left, the wings of birds and bats have a structure similar to the basic skeleton of a human horse. Joints are largely divided into shoulder, elbow, and wrist. When a bat's wings are folded, they form cape-like wrinkles, and bird feathers become longer toward the end of the wings.

If you look at a bird's wings from behind, when the wings are folded, the blue area overlaps the inside of the red area, exposing only the tips of the feathers.

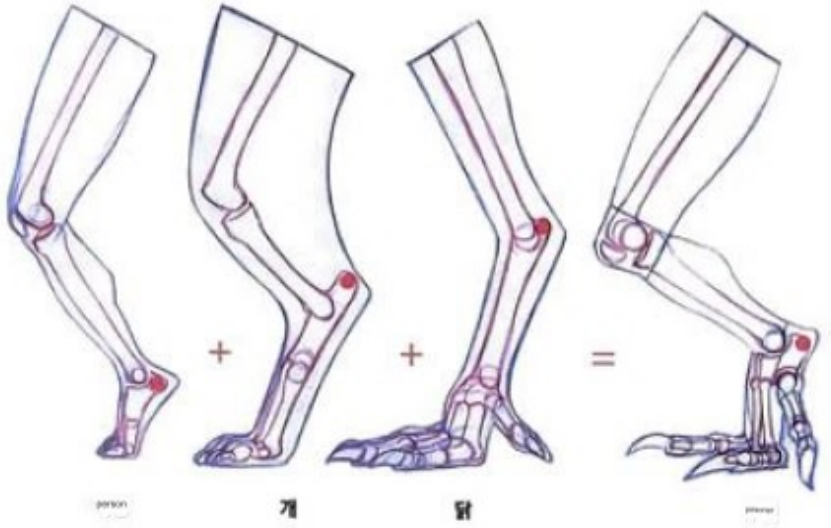
◂When a beast-human combined with a bird and a human are combined with wings, the wings must be drawn at least the same size as this picture to be convincing enough to fly. Typically, the wings are attached to the shoulder blades. This painting is a moment when the wings are bent inward after flapping, and both the inside and outside of the wings are visible, expressing a three-dimensional effect through overlapping.

We gave it a new feel by breaking away from the basic joint structure of bat wings and expressing it like a fluttering cape.

A mixed race between a vampire and a human> The concept is that of a mixed race born between a vampire and a human, and this is a female character who lives a double life as a lawyer by day and a vampire hunter at night. A characteristic of mixed race people is that they have only one wing, and the size of the wing acts like a tree ring that tells how many years they have lived. When the vampire's abilities are exercised, the huge one-sided wings flutter like a cape, and the sight of hunting the vampire is expressed to make one feel like a knight walking through the battlefield.

The horn on the head and the amulet on the hand are exorcism tools used in place of the nine-tailed fox's abilities when the crescent moon is at its weakest.

The nine-tailed fox, an Asian beastman, is based on the nine-tailed fox that appears in Oriental folk tales, and was designed with the concept of a magic fox that hunts ghosts that harm humans. It uses the spear head and the rope wrapped around its body as its main weapon, and its power becomes stronger as the moon rises. The human exorcist who taught the art of exorcism is set to tour the Paldo Island with the nine-tailed fox and exorcise evil spirits on the condition that he help find the lost fox bead.



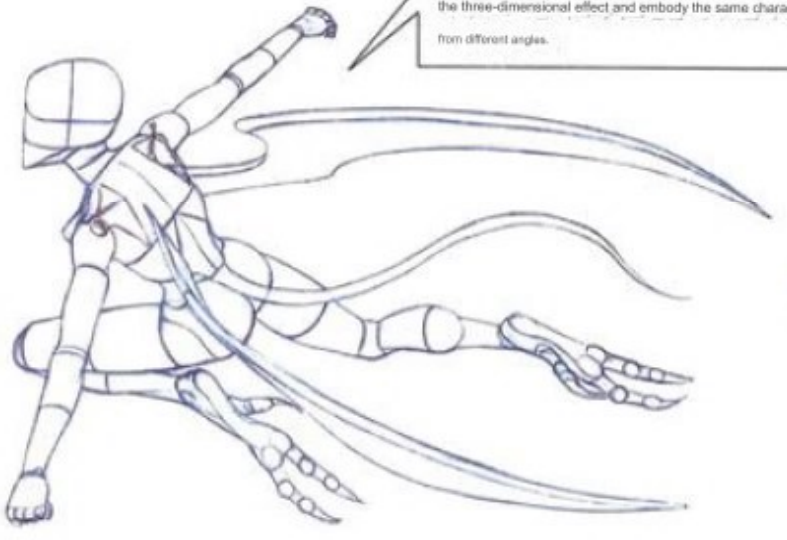
•Drawing a beast-man race based on anatomy

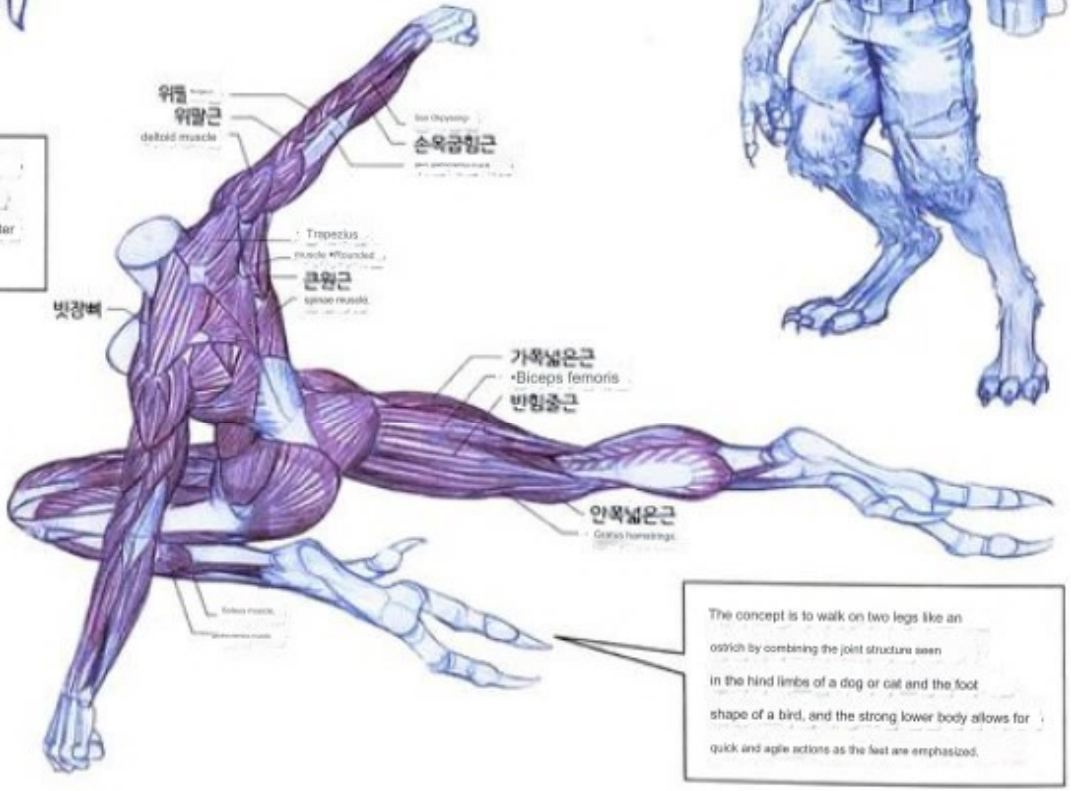
If you look at the various types of feet through the picture on the left, all animals except humans have a dorsal joint structure in which they move with their heels. In the process of evolving into bipedal walking, humans chose a walking style that was different from that of other animals. The feet of the animal characters on this page are based on the shape of human legs and feet and combine the characteristics of dogs and chickens. When drawing beastmen like this, you must create based on anatomical knowledge of the related animals to create a solid creature.

Characteristics of werewolves*

Among the beastmen, the most drawn race is the werewolf. Although there are differences in design for each werewolf that appears in the work, they are generally most often expressed as shown in the picture on the right. The face and lower body are made of a wolf-like skeleton, and the upper body is made of a skeleton similar to that of a human, making it possible to walk on two legs.

In creature works, the main flow of the skeleton and character is established and then diagrammed. Only then can you understand the three-dimensional effect and embody the same character from different angles.



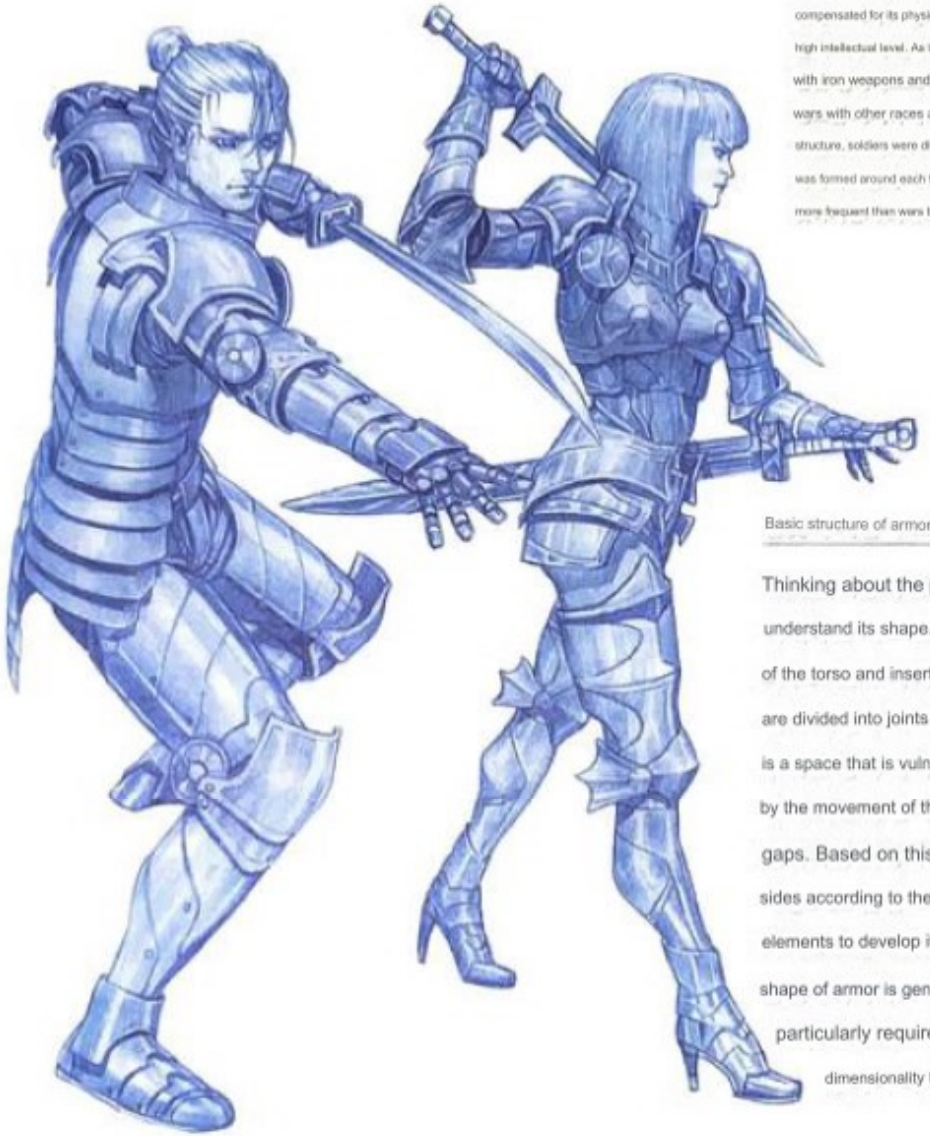


The concept is to walk on two legs like an ostrich by combining the joint structure seen in the hind limbs of a dog or cat and the foot shape of a bird, and the strong lower body allows for quick and agile actions as the feet are emphasized.

glue

Wood Elf Concept>

They are a beast people who live in a jungle-like forest with trees, and their pointed ears resemble those of elves, so they are called 'wood elves'. It has strong lower body strength and the feet of a bird, allowing it to nimbly jump between trees, grabbing branches with its feet. Wings exist, but they are used for jumping, not for flying. During hunting or war, they mainly use short swords, which are two-handed weapons.



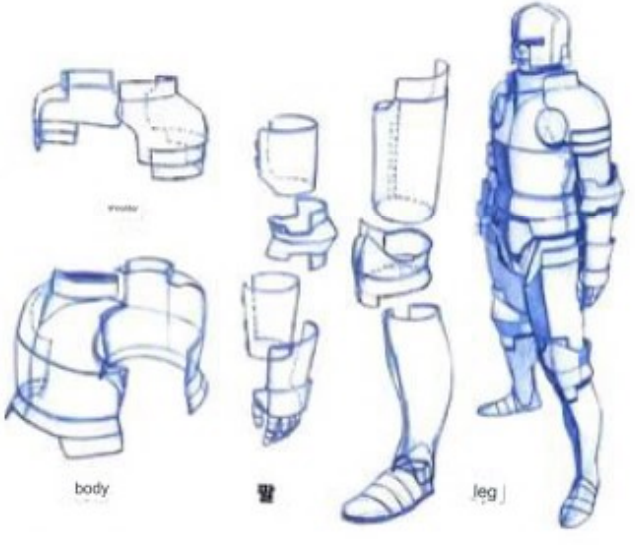
•Human worldview

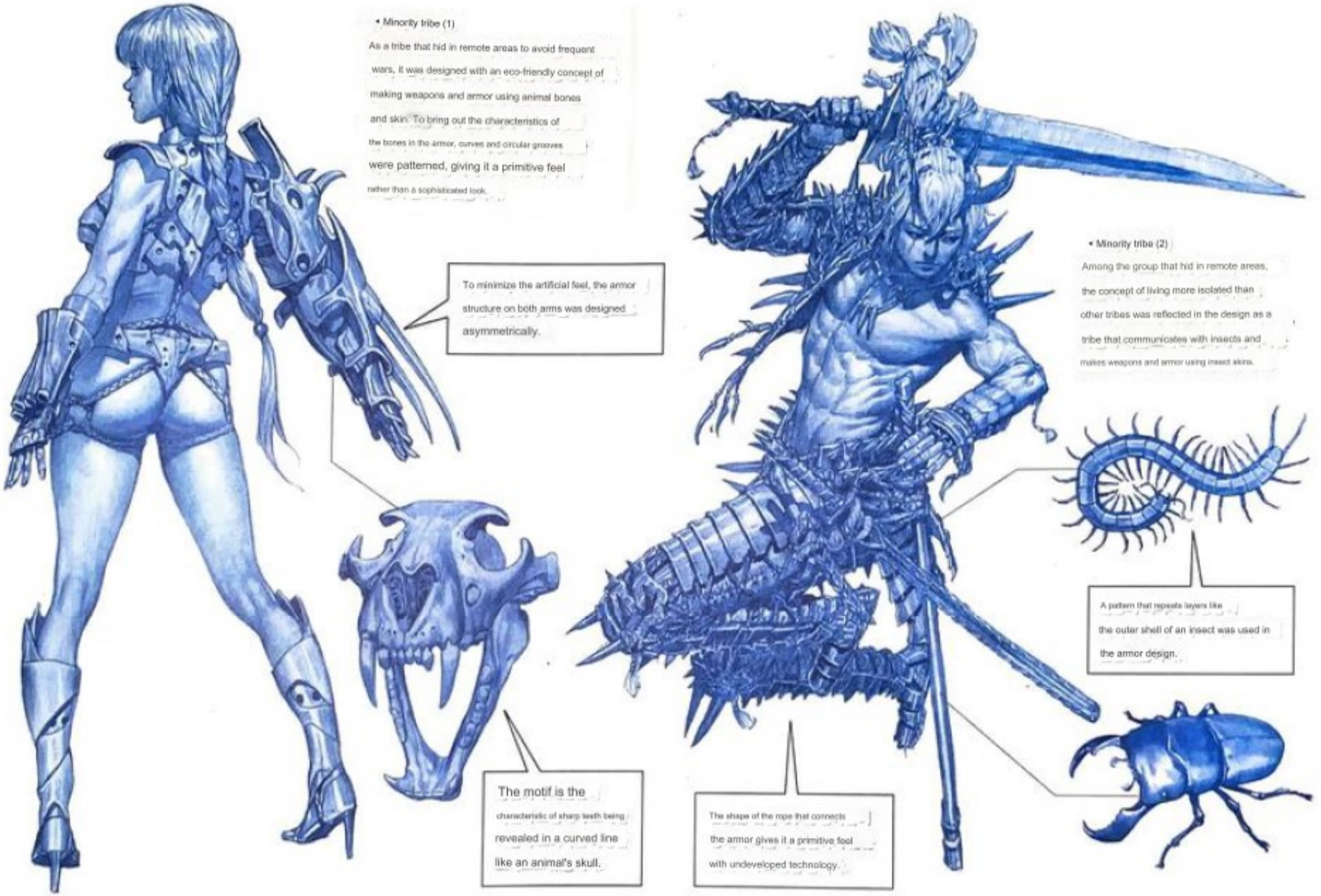
The human race, which has the weakest physical ability among the various races, compensated for its physical weakness by manufacturing weapons and forming a society based on its high intellectual level. As technology for handling iron developed, they protected themselves with iron weapons and armor, and with strong solidarity, they achieved many victories in wars with other races and took over the largest territory. In a human society with a class structure, soldiers were divided into types of armor according to their family and rank, and a nation was formed around each family. The world view is that as a result, wars between families become more frequent than wars between other races, leading to decline.

This is a villain character design based on the concept of a family that breaks the peace treaty and starts a war against all races as the human race declines.

Basic structure of armor

Thinking about the process of wearing armor can help you understand its shape. The structure covers the front and back of the torso and inserts the arms and legs, and the parts are divided into joints for movement. The armpit area is a space that is vulnerable to attack due to gaps created by the movement of the arms, so discs are added to fill the gaps. Based on this basic structure, we divide the sides according to the concept and add various elements to develop it into various forms. Since the shape of armor is generally symmetrical, it is an object that particularly requires the ability to understand three-dimensionality through diagramming.





• Minority tribe (1)

As a tribe that hid in remote areas to avoid frequent wars, it was designed with an eco-friendly concept of making weapons and armor using animal bones and skin. To bring out the characteristics of the bones in the armor, curves and circular grooves were patterned, giving it a primitive feel rather than a sophisticated look.

To minimize the artificial feel, the armor structure on both arms was designed asymmetrically.

The motif is the characteristic of sharp teeth being revealed in a curved line like an animal's skull.

• Minority tribe (2)

Among the group that hid in remote areas, the concept of living more isolated than other tribes was reflected in the design as a tribe that communicates with insects and makes weapons and armor using insect skins.

A pattern that repeats layers like the outer shell of an insect was used in the armor design.

The shape of the rope that connects the armor gives it a primitive feel with undeveloped technology.

A family located in the power of evil among the human race uses forbidden magic to create new objects in order to maintain their power forever. The humans chosen by the sphere created in this way can gain absolute power, but the sphere remains dormant for 300 years without anyone choosing it.

The Chosen One

The sphere that had been sleeping for 300 years awakens and selects a young man who was taken as a slave from a small tribe. The young man who gained the power of the sphere is reborn as an 'Iron Man' who can form and destroy iron and manipulate it at will. Afterwards, the Iron Man becomes the leader of a marauding tribe and fights against the forces of evil.

•Lack of looting

The setting is a group of runaway slaves and criminals who make a living by plundering remote villages or working as mercenaries. Initially, there were about 30 members, but as the number of ethnic minorities arising from frequent wars increased day by day, a new force was formed by uniting them.

A sphere made of forbidden magical power.

Orc concept

Orcs are menacing beings raised solely for battle, and to match their gigantic size, they mainly use techniques that inflict strong damage with warhammers or axes. Because the weight of the armor is heavy, the equipment is secured with chains rather than regular ropes. He likes to decorate himself with the horns of hunted animals as trophies. Most orcs have low intelligence and are warlike, but this character, as the leader of the group, has the qualities of a leader to lead the race with a cool-headed judgment of the situation and can devise advanced strategies. He possessed the qualities of a skilled strategist. Even though they have great power, they have a principle of not engaging in unnecessary battles or plundering.

battle in the snow

We wanted to express the honesty of Orcs who never back down even when they are outnumbered and surrounded by humans. Other races are reluctant to go to war with the Orcs, as they have a strong sense of camaraderie and have a habit of chasing down and killing those who pose a threat to their group.

Clash between orcs and humans.

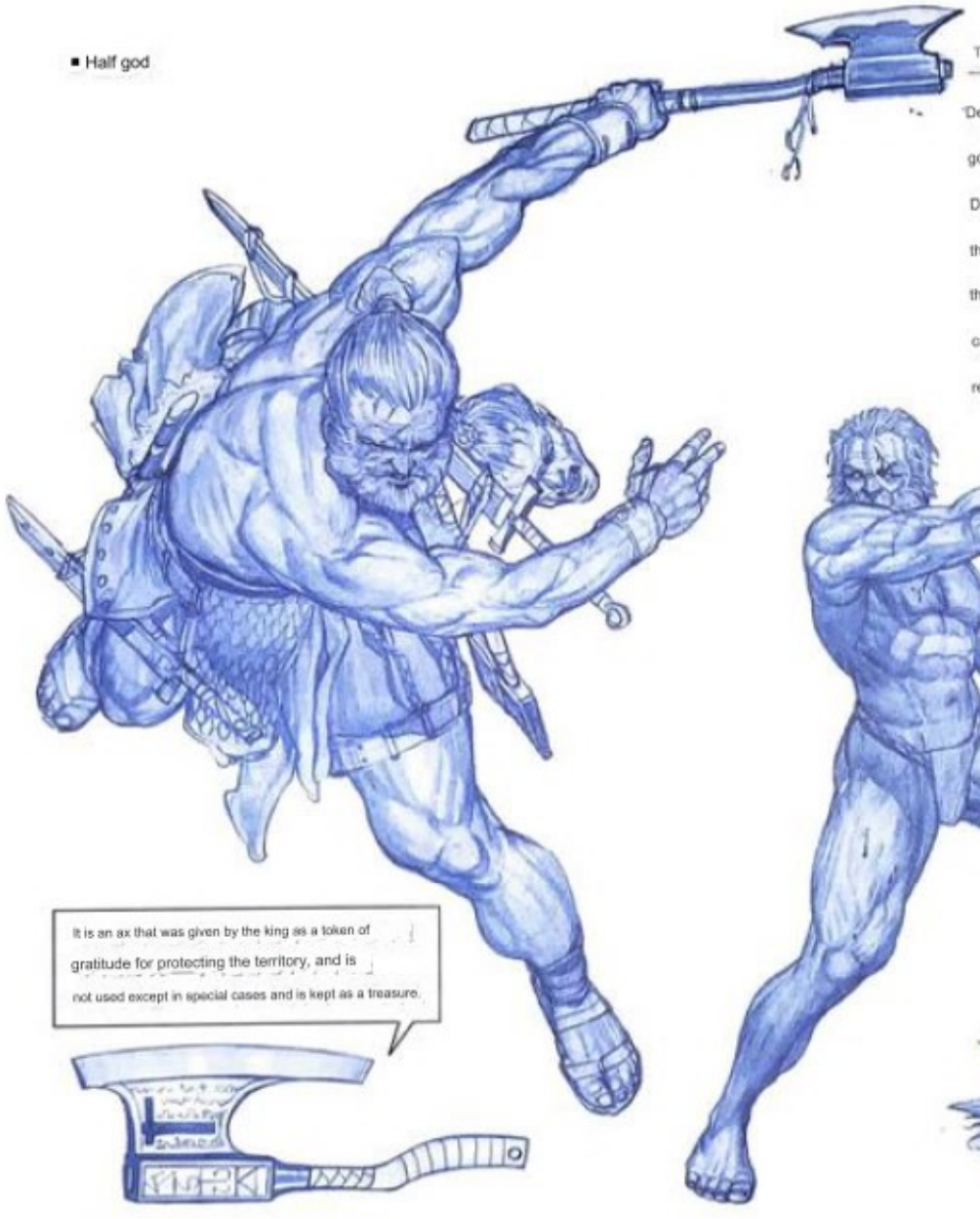
It's an action scene where humans are fighting against orcs alone, and it's a fight fight that doesn't lean towards either side.

The shock wave and cracks in the floor caused by the collision between the two characters have a strong impact.

■ Half god

The concept of half-gods

'Demigods' are a race born between gods and humans, and there are only 5 of them in the world. As a descendant of a god, they possess tremendous strength and have a long lifespan of a thousand years, but they are unable to reproduce. Due to his archenemy relationship with the giants, he is a character whose mission is to protect the border so that the giants cannot escape to other worlds in order to maintain a balance of power in the world. There are also cases where they stayed close to the Orcs and helped each other in battle. Because the giants have thick skin and hard bones, they cannot be dealt with with ordinary weapons, so among the human race, they are the only ones who have maintained a close relationship with the blacksmith family that manufactures weapons that can kill the giants.



It is an ax that was given by the king as a token of gratitude for protecting the territory, and is not used except in special cases and is kept as a treasure.

The horns that grow from the giant's head are considered a valuable medicine in the human world, so the demigods always collect the face after dealing with the giant. The giants see the headless corpse and regard the demigod as an object of fear. He loves alcohol so much that he sells the giant's horn and uses most of the money he receives to drink alcohol.

A duel between a demigod and a giant. Climb up the body of a giant giant as if you were climbing and hunt the giant.

Exaggerated perspective is applied to the giant character, creating a feeling of hugeness and depth of screen.

3 Drawing a mechanic character

• Mechanics and diagramming

A mechanic, an artifact, can literally be said to be a combination of shapes. Human figure drawing and mechanics, which involve dividing large shapes into smaller shapes, are drawn in a very similar way, and if you have a habit of drawing with shapes on a regular basis, you will be able to express the mechanics without difficulty. However, if you are unable to find a major flow in a complex form of mechanics, it means that you lack the habit of interpreting the structure through shapes.

Figure 1

Figure 2

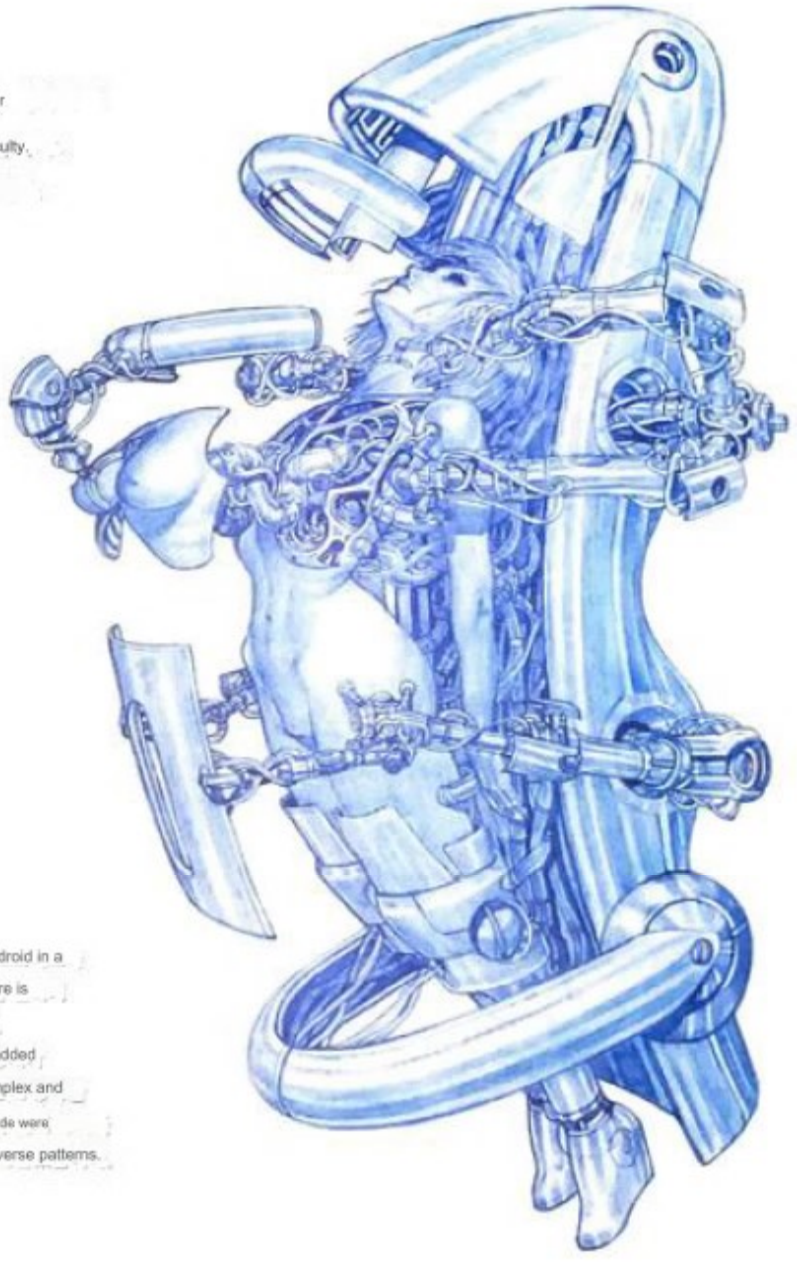
Figure 3

◀ Drawing with patterns

When designing a mechanic, it is better to draw several design concepts rather than splitting them into parts. Figure 1 is a patterned drawing of an angled, straight flow, and Figure 2 is a patterned drawing of a wave-like curved flow. Figure 3 depicts a smooth curve as the main flow with minimal angled parts. By selecting and drawing several patterns like this, you can create a sophisticated design with unity.

Mechanical Concept •

This drawing depicts the process of assembling an android in a large capsule-like machine, and the flow of the structure is expressed in a streamlined form to create a futuristic feel. Also, to prevent an overly consistent design, we added strength and weakness to the flow by intersecting complex and simple parts. The parts that open the chest and reveal the inside were designed to resemble actual organs, creating more diverse patterns.

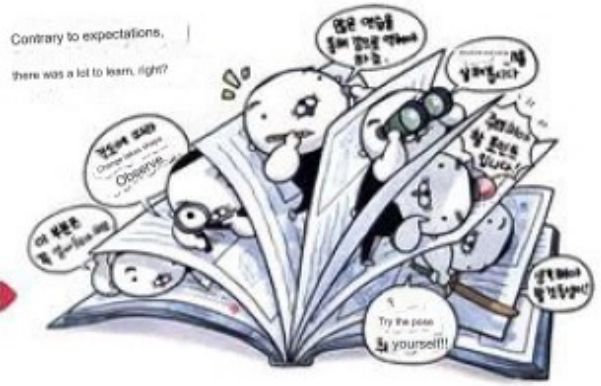


Designing a SF Concept

You are sitting in the cockpit and controlling the ship using a hologram, and you can see that you are in a state of weightlessness through the hair and the cassette player floating in the air. The futuristic feel is expressed through spandex clothing inspired by wetsuits, and the geometric shape created by connecting the hoses of the mattress the character is sitting on into a sphere of unknown purpose arouses curiosity. When designing SF objects, it is easy to think that they should be expressed in angular patterns to create an artificial feel, but you can also bring out the SF feel by designing curved patterns as shown in the picture below. The screen was angled close to the feet of the character lying down, creating a space with a sense of depth through a screen with hypertransparency.

There were probably some people who

first opened the book with this thought in mind.



Through this book, I wanted to say that the only way

to draw the human body well is to understand its structure and principles.

And for what you have learned to be applied

to your drawings, you must practice for a long time.

Only then can you have the concentration to work

hard until the end when creating a work.

Eraser dust accumulates every day.

If you practice with the mindset of

throwing away each piece rather than leaving it behind.

Clearly you are getting closer to your goals.

When you start studying the human body, if you don't assume that it takes a long time and a lot of effort to draw it well, you may wonder, 'Why is it so difficult?' 'Why isn't it happening soon? As I think about it, I become less and less motivated. Just drawing the human body while looking at an actual model is difficult, but it is only natural that creating a human figure without a model is difficult. Nevertheless, when I get stuck on drawing, I put down the pencil and start thinking about my talent. There was a time when I questioned myself about my talent. I think I was able to dig into the basics because I thought I didn't have the talent to create sensory feelings.

However, even now, I find it difficult every time I draw the human body. Instead of getting easier the more you draw, it becomes more difficult each time you draw. I hope that we can all move forward together with the goal of enjoying the moment of being completely immersed in the painting, rather than taking happiness in being able to draw easily and well. I feel like I want to revise it again because the pictures are lacking, but I will put my regrets aside and close the bookshelf here, saying thank you to those who helped me work on the book.

Sangcompany manager Park Sang-hee, who worked hard to redesign every page to match the picture, author Yeom Eun-bi, who drew cute characters like biscuit star candy in a book that could have been heavy and hard, and Buddha who established a relationship with Seongandang. Author. Whenever I got stuck in writing, I eagerly opened <Sakyamuni Anatomy Notes>. Also, the staff at Seongandang Publishing who patiently watched over the delayed schedule and accommodated many things in the direction I wanted. Professor Kwan-Hyeon Yoon, who improved the accuracy of the book by taking into account the artist's imagination even though it was lacking in some areas in the eyes of experts, and Professor Hyun-Se Lee, my eternal teacher who always became a lighthouse in my heart and my hero who guided me to pursue my dreams. I will become a disciple who always strives forward with respect and gratitude as my driving force. Lastly, I would like to thank the readers who waited for the book and read it until the end.