Being Articulate

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Joints are a place where two or more bones meet. It is a place where bones can move in relation to each other.

Muscles are attached to bones, across joints. When we move, we contract our muscles, the muscles get shorter, and the bones the muscles are attached to get closer together. Another way of saying that is: the angle between the bones of a joint decreases.

Your elbow is a joint. If you sit at a table, and lay your hand on it palm up, then bring your hand toward you, you will "bend your elbow." You "bent your elbow" because you contracted the muscles that go across the joint between your upper and lower arm bones. Contracting that muscle pulls your lower arm closer to your upper arm.

We are able to move because of our muscles, joints and bones. Joints allow us to move, and also limit our movement. In the example above, you brought your palm closer to your upper arm. Try the opposite. With your arm palm up on the table, try (very, very, very gently!!) extending your arm by straightening it. Can you move it very far? I hope not! You can't move very far that way because the structure of your elbow joint will not allow it.

What we think about our structure—what we believe about how we are put together—will have a significant influence on how we move. If we have inaccurate ideas about our anatomical structure, we will embody those ideas in how we move, and our moving will not be free and easy. If we have an accurate concept of our structure and how it works, we will be able to move freely and easily.

Let's now find some important anatomical landmarks.

Where is Your Head?

Do you know where the top of your spine is? The bottom of your head rests on the top of your spine. Think about that for a moment, and then put a finger on your neck at the level you think is the top of your spine. Where is your finger? Some people think the top of their spine is at the level of their collar. Some people think it is at the level of the bottom of their ear lobe.

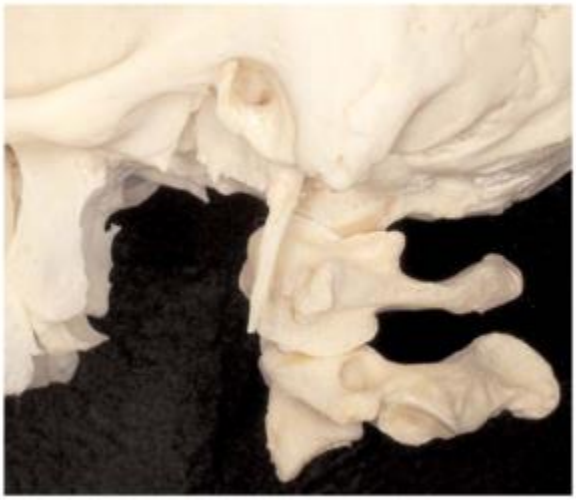
How To Locate the Top of Your Spine

Put your fingers in your ears. Very delicately tilt your head forward and back just a few millimeters. Notice where that moving is happening. The top of your spine is at the middle of the bottom of your skull, between your ears and behind your nose. Is that where you thought it was?

The Structure of the Joint Between your Skull and Spine

Here is a picture of the back of a head and spine:

Here is another picture, from the side:



Notice the shape (the structure) of the bottom of the skull and the top of the first vertebra, the atlas. This is the atlanto-occipital (A/O) joint. The bottom of the skull is convex shaped; the top of the first vertebra is concave shaped. This structure is what allows for our whole head to move forward and backward, in a rotational movement on the top of our spine. We can only move rotate our head a tiny bit forward and back; if we want to look up to the ceiling or down to the floor, we have to use more cervical vertebrae, one at a time, in order.

Where Are Your Arms?

How much of you is arms? Take a hand and put it where you think the joint is between your arm and your body. Where are you pointing?

How To Locate Your Arms

Take one hand and find one of your collarbones. Trace its length until you find the place where your collarbone meets your breast bone (you should feel a “bump.”) Find the same place with your other collarbone. Now, take your right hand, put your thumb on the joint where your left collarbone meets your breastbone and lay the fingers of your right hand along the length of your collarbone. Move your left arm. Can you feel your collarbone move also?

Your collarbone is moving because it is an arm bone. Your scapula (often called "shoulder" blade) is also an arm bone. Can you feel it moving when you move your arm around?[i]

Take a moment to explore how you can move your arms. First notice what you are doing with your head in relation to your whole body. As you continue with this noticing, think of letting your fingertips lead your arm into moving. You might reach out toward something that is in front of you, or you might trace a figure 8 in the air. Whatever you do, see how easily you can let yourself move.

What do you notice doing this experiment? Most people, when they realize where their arms actually start, and when they let their whole arm (including their collarbones and scapulae) be free to move, find that their moving is much freer and easier than before.

Where Are Your Legs?

How much of you is legs? How "far up" your body do you think your legs go?

If you can, stand up, and put one hand low on your tummy, palm toward you, fingers pointing down. Put your other hand low on your back, on your sacrum, palm toward you, fingers pointing down. Shift your weight onto one leg, and begin to move your other leg around. Move it forward and backward and to the side. Can you feel your leg moving around your body? Can you feel your leg moving in your hip socket? Now try moving the other leg.

Continue moving a leg, forward, back, around and to the side. Can you feel the muscles you use to move your leg? These are leg muscles.

How Long is Your Spine? And Where is It? And How Many Curves Does It Have?

Here’s a way to find the length of your spine. Put one finger in an ear, and with your other hand trace the length of your spine all the way to the bottom. (You will probably have to start this tracing about the middle of your back). At the bottom of your spine is a knobby bit. That is the bottom of your your coccyx. That bone is at the very bottom of your spine; your finger in your ear is at the top. Sit with that a bit.

Many people also think that their spine is at the back of their body. It’s an easy mistake to make because when we feel our back, we feel these bones, and think: spine bones! that must be where my spine is!

Well, not really. The bones you feel are the spinous processes. They are the bones that stick out at the back of each vertebra. Here’s a picture of the 5th lumbar vertebra.

The part that "sticks out" from the back of the vertebra—the spinous process—is really just a small part of our spine. The parts that stick out to each side are the transverse processes. The large round bit is the body of the vertebra.

All of our spine supports us; the lumbar vertebrae are particularly large because they are at the bottom of our spine, and thus have to support the weight of all that body above them.

Here's a picture of a spine from the side, in a person:

photo courtesy Sarah Barker

Your spine is in the middle of your body. And it has four curves: one at the top, the cervical curve; one by your ribs, the thoracic curve; one at the bottom, the lumbar curve, and one at the very bottom, the

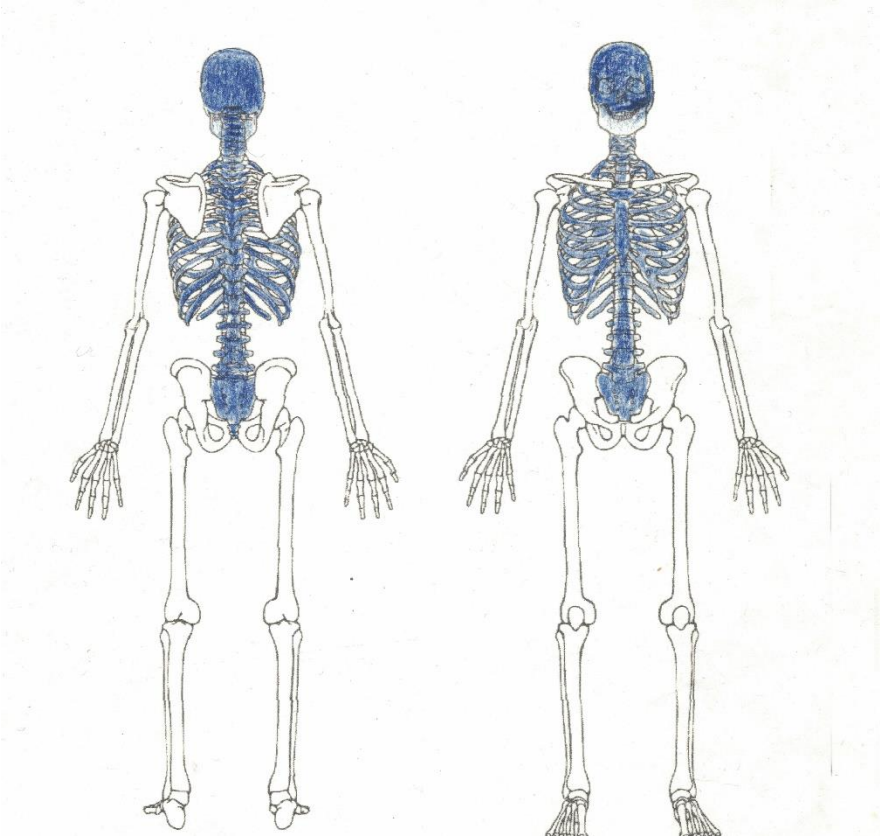
sacral curve. (The coccyx is sometimes also counted as a curve in which case we actually have five curves!).

These curves allow us to move flexibly and also give much more weight bearing support than if our spines were straight. So, remember and enjoy them!

Axial and Appendicular Skeleton

Your axial skeleton is the bones of your torso: your head, spine and ribs. Your appendicular skeleton is everything else. Your axial skeleton is your "body." Your appendicular skeleton is your arms and legs. Your arms and legs move independently of your body.

Here is another picture. The axial skeleton is in blue, everything else is appendicular. (Notice that the jaw is part of the appendicular skeleton).



Remembering that you have “two spines” and that your appendicular skeleton moves independently allows you to organize your moving most easily and efficiently.

Arm and Leg Muscles, or: How Much of Your Back is Back?

Remember when you stood on one leg and moved your leg around? If not, stand up and move your leg

around again. Notice the muscles that are moving as you move your leg. The muscles that move your leg are leg muscles.

Move your arms again. Remember that your collarbone and scapula are arm bones. The muscles that attach to them, and move them are arm muscles. Can you notice which muscles are moving as you move your arms?

Many of us think of "back" muscles as the ones we can see on a person's back. But almost all the muscles on your back that you can see are really arm or leg muscles. Some of your arm muscles go almost all the way down your back. Some of your leg muscles connect much higher on your back than you may think. Your arm and leg muscles are on top of your body muscles.

Why Is It Important To Know About Muscles and Bones?

Because what you believe about your structure will affect how you move.

Let's try an experiment. Even though you now know where your arms attach to your body, disbelieve that for a minute. Instead, believe very, very strongly that your arms attach at "the shoulder" and that your collarbones and scapulae are part of your body. Now just move your arm—don't let your collarbone or scapulae move, that's part of your body, and you only want to move your arms.

What happened? What did you notice?

Now forget that idea, and remember where your arms really attach to your body. Remember that your collarbones and scapulae are arm bones, and the muscles that move them are arm muscles. Move your arm.

What did you notice? Is moving your arm different when you believe your collarbones and scapulae are part of your body compared to when you believe they are part of your arm?

Most people notice a difference between the two ways of moving their arm. The second one usually feels easier and more free. And what made the difference in the two experiences? The difference was what you believed about your structure.

What do you believe about the muscles of your back? If you think of the muscles on your back as "back" muscles, instead of muscles that primarily move your arms or legs, then you may try to use them to do the work of your real back muscles, which are much farther in and underneath the muscles you can see. You may try to "hold yourself up" using some of your arm muscles. You may use your leg muscles to try to "stabilize" your torso.

Arms and legs work best when we leave them alone, and one of the best ways to leave them alone is to realize that they are independent of our torso, and can move independently and freely from our torso.

Lastly, Have Fun!

You now have a lot of information about how we work. Play with it, notice what you notice, and most importantly, have fun!

[i] Do note that if you look in a classical anatomy textbook you will find the bones of the arm listed as humerus (the "upper" arm bone) and the radius and ulna (the two "bottom" arm bones). The collarbone (clavicle) and "shoulder blade" (scapula) are listed as part of the "shoulder girdle." This is a traditional distinction to make it easier for anatomy students and medical people to label and talk about these bones. However, functionally—meaning how the bones move—the collarbones and scapulae are part of your arm. It is very important that you keep this distinction clear. If you know that your collarbones and scapulae function as part of your arm moving, then you will leave them alone to move freely as needed when you move your arm.