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MetaAnatomy

A **Modern Yogi's** Practical Guide to the **Physical** and **Energetic**
Anatomy of Your **Amazing Body**

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Introduction

THIS BOOK IS not really an anatomy book.¹ I think of it more like a book about connections. It's funny, but when you ask people to define *connections*, they often tell you about the times they felt disconnected. These disconnections often remind us that something is amiss. Something is out of balance. Whether it comes from strife in a relationship or an injury to the physical body, the raucous sounds of disharmony wake us up to the beautiful potential of harmony.

As humans, we are a wonderful mess of contradictions. We are incredibly strong yet fragile. All of us look very similar—heck, 99.9 percent of our genes are similar²—yet the teeny differences make a huge difference in how we move through the world. Our bodies are made up of all of these seemingly varied parts, yet they work together like a world-class orchestra tuned to play the most intricate symphony. We are awesomely complex, but as my teacher Rod Stryker likes to tease us when we are getting carried away with ourselves, we are not *that* interesting or complex.

I still become giddy every time I get the chance to talk to someone about their magnificent form. As a student of the body for more than twenty years, I'm still amazed at the hidden gems and the new information that I continue to find. My intent in launching *MetaAnatomy* was to explore the dynamic beauty and poetry of who you are. The prefix *meta-*, like in the words *metaphysical* or *metacarpals*, means “beyond.” *MetaAnatomy* is my attempt to go beyond our often limited view of our own form.

I also really love the idea of meta-analysis, examining the data from many different studies that ask the same question: Who do we think we are? For millennia, humans, whether they are anatomists or yogis, have been creating models and maps to try to answer that very question. I believe that combining our understanding of the physical and energetic anatomies helps us form a richer view and experience of ourselves. My hope is that this combination will bring about a celebration of our differences and, ultimately, an honoring of our connectedness.

1. No takesy-backsy.

2. Before you get too caught up, we also share 90 percent of our genes with cats.

I've subdivided this book into three tasty nuggets. In part 1, "The Physical," I introduce you to your physical form, or what I like to call the meat suit. We will do this first by deconstructing all of our bodies' bits and bobs, which will give you the anatomical language you need to get to know your meat suit in all of its glory. While I have written these chapters for students and teachers of yoga, I firmly believe that they include information that everyone should know. Please keep in mind that what I'm giving you is just an introduction to some of the tissues of the body. In the interest of brevity and comprehension, only certain bones, joints, and muscles have been illuminated. I've tried to condense what can be the overwhelming topic of human anatomy into fun-size bites. In this attempt, some aspects have been simplified and generalized, but hopefully without diminishing their importance or compromising the accuracy of the information. Each chapter will conclude with a little taste test—a small experience or exercise to prompt you to put into practice what you just learned.

In part 2, "The Poetic," my intention is to make connections between the physical and energetic anatomies, between systems or schools of yoga, between you and me as we share our embodied experience of being alive in these forms. Starting with different ways to investigate the concept of energy, we will draw correlations between

what we can see and what we can experience. Then we'll take a deep dive into our breath, our nervous system, and the ancient yogic technologies that can have an immediate impact on our physiology. These chapters each include a meditation that will help you turn all the theory into a lived experience.

In part 3, "The Practical," we'll talk about how to bring together all of the information in parts 1 and 2 to make real, lasting, practical changes in our lives as well as in our yoga practice. I'll give you tools you can use to develop X-ray vision! This will allow us to look inside the meat suit and see the unique shape and proportion of your bones and joints so that you can then develop a personal practice that celebrates your uniqueness. I'll also talk about yoga postures and yoga teachers' verbal cues that can sometimes be problematic for students. With curiosity and the evolving lens of biomechanics and yoga therapy, we can at least open a discussion about the benefits of these postures and cues and their place in our own practice or teaching. Each of these chapters will include accessible minipractices that can immediately connect you to both your physical and your energetic anatomies.

Where applicable, I've tried to give a historical context or text when defining certain energetic maps and models. I have done my best to suss out the hotly debated timelines, definitions, and interpretations,

but I'll leave it to my more scholarly friends to argue the details. Instead of dissecting and separating the information into different yogic lineages, I find it more interesting to view how cultures, art, schools of thought, and societies have had an effect on the study of both yoga and anatomy, as well as how these factors continue to contribute to their evolution. I have included a lot of Sanskrit, as its definitions have a way of unfolding to expose a treasure trove of understanding. But I've decided to leave the diacritical marks out of the Sanskrit terms so that we can remain friends.

If you are looking for instructions on how to get into full Lotus or pictures of bikini-clad models performing Chin Stands, sadly, you won't find them in this book. Feel free to use it to even out a wobbly table leg instead. But if you're looking for a practice to maximize your unique potential or if you're looking to teach or practice safe, anatomically meaningful healing sequences that help you explore the more subtle aspects of your energetic, mental, and emotional bodies, which drape your true self like layers of fine silk, my great hope is that you will find it here.

In this book I'm sharing what I've learned from the amazing teachers that I've been lucky to study with. I'm sharing

it as I have remembered it and through the lens of my own lived experience. In other words, any praise can go directly to my teachers, and any complaints or disagreements can be forwarded to me.³

All my classes and workshops begin with the Sanskrit chant that was given to me by my first teacher:

Guru Brahma
 Guru Vishnu
 Guru Devo Maheshvarah
 Guru Sakshat Param Brahma
 Tasmai Shri Gurave Namaha

It is a lovely, profound chant, that I translate as the following: "The beginnings are our teacher. The start of something new, coming into a posture and even inhaling are an opportunity to learn the truth of who we are."

The experience of right now, the present moment, can be our teacher. The trials and tribulations, the ups and downs, the sustaining of the breath or posture are all opportunities to understand the truth of who we are.

The endings of things can also be our teacher. The ending of a job or relationship, the exhale, and the coming out of a posture are all opportunities to realize the truth of who we are.

3. I have a very special circular basket for such things.

Everyone around you is a teacher who can help to illuminate the truth of who you are.

There is also a teacher who is indescribable and beyond all form.

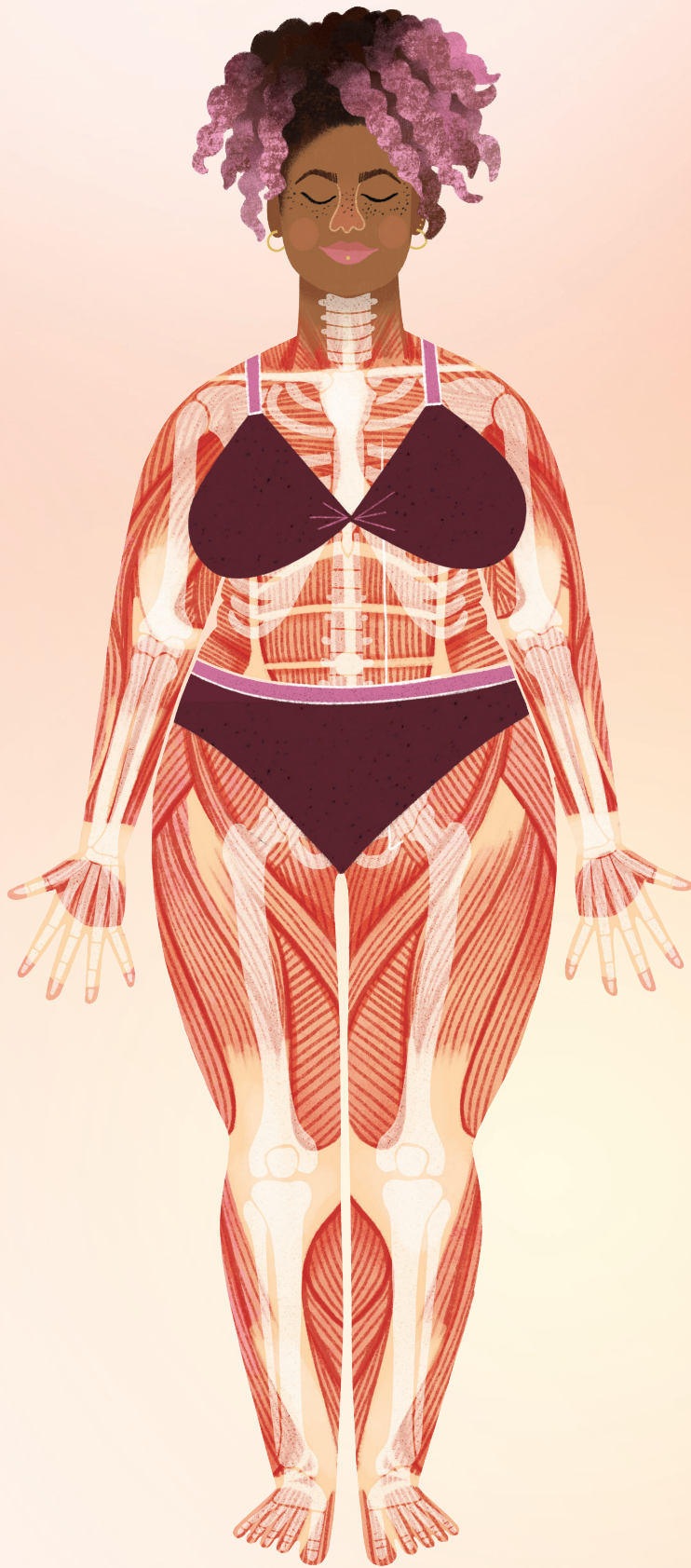
I offer all of my efforts to these teachers. Everything, everyone, and every moment become an opportunity to learn about ourselves.

This book is just the beginning. My hope is that after this introduction to your body, you will be excited to continue learning and asking questions. Even after many years of studying the body, I'm amazed at how my perception and understanding continue to shift. My first attempt to understand the body came from books and two-dimensional pictures. It was only after I started to work with real bodies in yoga classes and anatomy labs that I came to realize how utterly unique we all are. Looking at real bodies also begins to reveal the truth that everything is interconnected, interwoven, and interdependent. While it may be helpful to label individual body parts for study, the reality is nothing can be separated. Many of the separations that we label in the body were just arbitrary ones drawn by anatomists. But when we take a larger view, considering things like tissue function and action, we see that everything inside of us is truly connected.

The celebration of our differences and the ever-shifting transient nature of body, mind, and emotion can lead us to recollect and reunite with the part of us that

is unbound and pure potential. When we recognize that part of us in ourselves, it becomes easier to recognize it in others. It is my sincere hope that this practice will ultimately lead us to remember and honor our connectedness.

I'm so happy to be on this path with you.
Let's get started!



PART ONE
THE PHYSICAL

Your Meat Suit

OH, MY GOODNESS! Where are my manners? Let me introduce you: This is your body. This is your body on yoga. Any questions?

I thought there might be, so let's jump in!

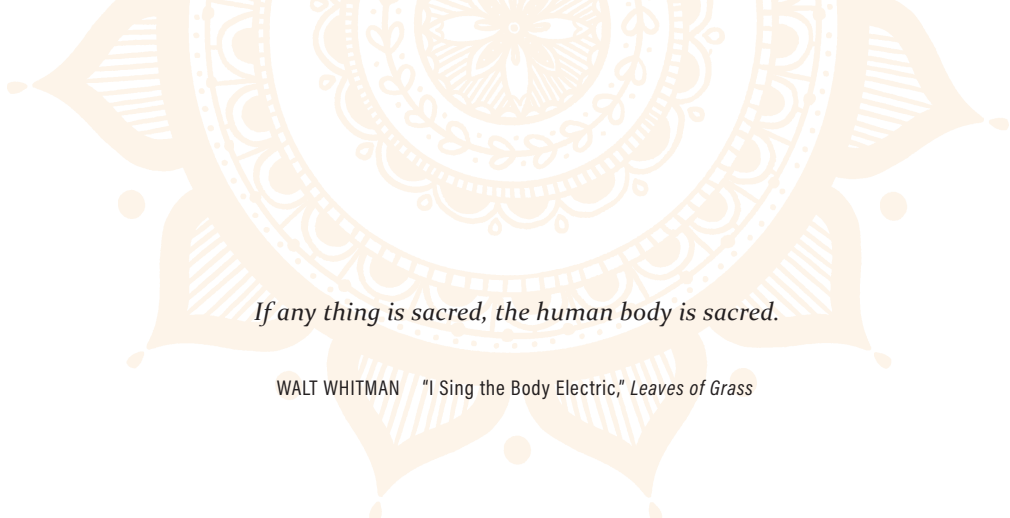
We are inhabitants of an amazing, awe-inspiring vehicle. These vehicles allow us to run, jump, dance, shimmy, kiss, hug, read, sing, and learn new things. They allow us to stretch, bend, contort, and stand strong in our yoga postures. But for some reason, we're more likely to study how our new fancy-pants smartphone works than the beautiful potential of our bodies and what they can do. It's unfortunate, because while we're likely to have our phones for only a few years, with care and some luck, we can walk around in these elegant forms for eighty to a hundred years!

Even in the definition of *yoga*, there is inspiration to study anatomy. The word *yoga* is often translated as “to

yoke together.” Our English word *jugular* comes from the Latin *jungere*, which also means “to yoke or join together.” The jugular veins in our body connect the head to the heart; perhaps this physical connection poetically resonates with a practice that has the ability to connect us to our heart center.

When we, as students and teachers of yoga, begin to understand the different characters that make up the body, we can then ask them to do what they do best. We can harness our innate power and stop asking them to do things that are not on our body’s résumé, thus preventing pain and injury.

Sometimes studying anatomy can seem overwhelming at first. You can think about it being like learning a new language. Once you learn a few key phrases, that language—the language of our form—becomes easier to understand.



If any thing is sacred, the human body is sacred.

WALT WHITMAN "I Sing the Body Electric," *Leaves of Grass*

CHAPTER 1

Them Bones, Them Bones

WHEN PEOPLE ASK me what my favorite body system is,¹ I have to say the skeletal system. While admittedly not as sexy as the nervous system, it definitely holds a special place in my heart.

But before we start our tour of the skeletal system, we have to meet up at home base. We have to have a starting point or an agreed-upon neutral place before we can learn how to safely and efficiently move from there. In anatomical terms, this starting point is called anatomical position, which looks a whole heck of a lot like our yoga posture Tadasana, or Mountain Pose.

In anatomical position, the subject or yogi is standing in front of the observer. Her feet are flat on the floor, facing forward, and underneath her hips. Her arms are by her sides. The palms of her hands face forward, and she is looking straight ahead. From here, we can refer to different parts or locations of the body by using the following terms:

Anterior: near the front of the body; in front of

Posterior: near the back of the body; behind²

Superior: above

1. Full disclosure: not many people ask me this.

2. I remember this like, "Dude! He's got a nice posterior!" But that's just me.

Inferior: below

Lateral: toward the side; away from the midline

Medial: toward the midline

Distal: away from; farther away from the origin

Proximal: near; closer to the origin

Superficial: toward the surface

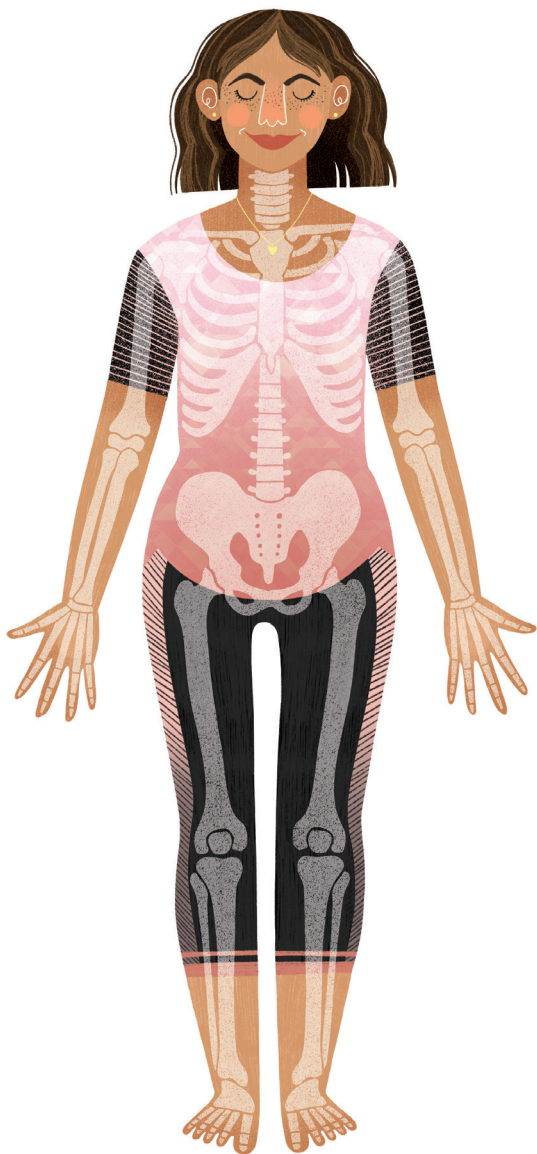
Deep: closer to the core

Now that we have some direction, let's talk bones.

There are 206 bones, give or take a few, in your adult body. I say “give or take a few” because we are actually born with quite a few more—around 300. As we age, some of these bones ossify, or join together. Moreover, one in twenty people will have an extra rib, and 10 percent of the population has an extra vertebra.

I've been lucky enough to see many bones and skeletons in my life,³ and I can safely say that no two are exactly alike. We cannot X-ray our students and see all of this variety as they come into our classrooms, so we must remember that every skeleton is slightly different. It's also really important to remember that though we study the average body in our anatomy classes, there is a huge variety of human anatomy. Along with muscle, ligament, energy, constitution, and mood, your students are all wildly unique!

As yoga teachers, we must keep this variety in mind and not ask for cookie-cutter postures or demand that every student do the postures in the same way.



3. I feel compelled to say here that I'm not a serial killer.

It's just not anatomically possible. For example, depending on where your hip sockets face and how the bones articulate together, it may be impossible to get your knees to the floor in a seated crossed-leg posture—and that's okay! Trying to push those knees down or telling your students to “keep working on it, and it will come” can and will lead to injury. While there are some tricks to determine if the restriction is bony (and ain't changing) or muscular (and could change), our best bet is to help our students find the presence inside their posture rather than some idealized shape.

It's easy to view the skeleton as just a functional and structural element that's there to keep us from being amorphous blobs. This unjust view is not helped by the fact that as anatomy students we are often shown plastic models and two-dimensional Halloween drawings of the skeletal form that belie its magnificent truth: the skeleton is living, dynamic, ever-changing, and remodeling tissue. In fact, because of this remodeling, you have a completely different skeleton every seven to ten years. Set in the fluid bath of your body, it can have the tensile strength of steel but a touch of elasticity like a reed of bamboo—strong, yet yielding.

A real bone specimen is quite different from its plastic anatomical-model counterpart. The bones of the skeletal system

are made up of different types of cells. Two cells, called osteoblasts and osteoclasts, are constantly remodeling the bones.⁴ Imagine trying to lift a bowling ball. As you do, your muscles, via their tendons, pull on the outer stocking that's around your bones, called the periosteum. When this healthy stress is applied, the osteoclasts in the bone underneath start to break down. This breakdown sends out a call of, “Hey! I'm breaking down over here! Let's make more bone cells.” Osteoblasts then mobilize to rebuild the bone under that stress. This same process is how bones heal after a fracture.

This dance of breaking down and building up of bone tissue begins to wane as we get older. With more breaking down than building up happening, we are sometimes left with more small holes inside our honeycomb-like bones, which leads to lower bone density, weakness in the bones, and possible fractures. In women, special hormonal changes during perimenopause and menopause act on calcium in the bones and can cause osteoporosis. Often, doctors will prescribe weight-bearing exercise as we age (and, by the way, yoga is a weight-bearing exercise) to strengthen muscles. Stronger muscles, in turn, increase the bones' density and, as a bonus, provide a muscly scaffolding to help support our bones and joints.

4. I've always thought *Remodeling the Bones* would make the best HGTV show.

The skeleton, like the soft skin on our non-Botoxed face, is a road map to every experience that has touched us. It begins to tell the story of our lives to those who have grown quiet and skilled enough to hear it. That's what the skeleton feels like to me: a snapshot of your past, but also a vehicle for the ever changing.

When studying the skeleton, we can divide it into two important parts: the axial skeleton and the appendicular skeleton.

The axial skeleton, just like it sounds, forms the axis of the body. It includes:

The skull (cranium/maxilla):

made up of several different bones (but for our purposes, we'll just lump them together)

The mandible: the jawbone

The ossicles (incus/malleus/stapes):

teeny-tiny bones of the inner ear

The hyoid: the U-shaped bone

in the throat area to which your tongue attaches

The vertebral column: made up of twenty-four individual articulating vertebrae, plus the sacrum and coccyx

The rib cage: made up of twelve pairs of ribs: R1 to R7, known as true ribs; R8 to R10, known as false ribs; R11 and R12, known as floating ribs

The appendicular skeleton, like it sounds, includes the bones of the appendages:

Clavicle: the collarbone

Scapula: the shoulder blade

Humerus: the upper arm bone

Radius: the thumb-side forearm bone

Ulna: the pinky-side forearm bone

Carpals: eight pebble-like bones in each wrist

Metacarpals: the bones of the hand distal to, or beyond, the carpals

Phalanges: the bones of the fingers

Pelvis: a single bone made up of three parts—the ilium, ischium, and pubis

Femur: the upper leg bones, the longest bones in the body

Patella: the kneecap

Tibia: the medial shinbone

Fibula: the lateral shinbone

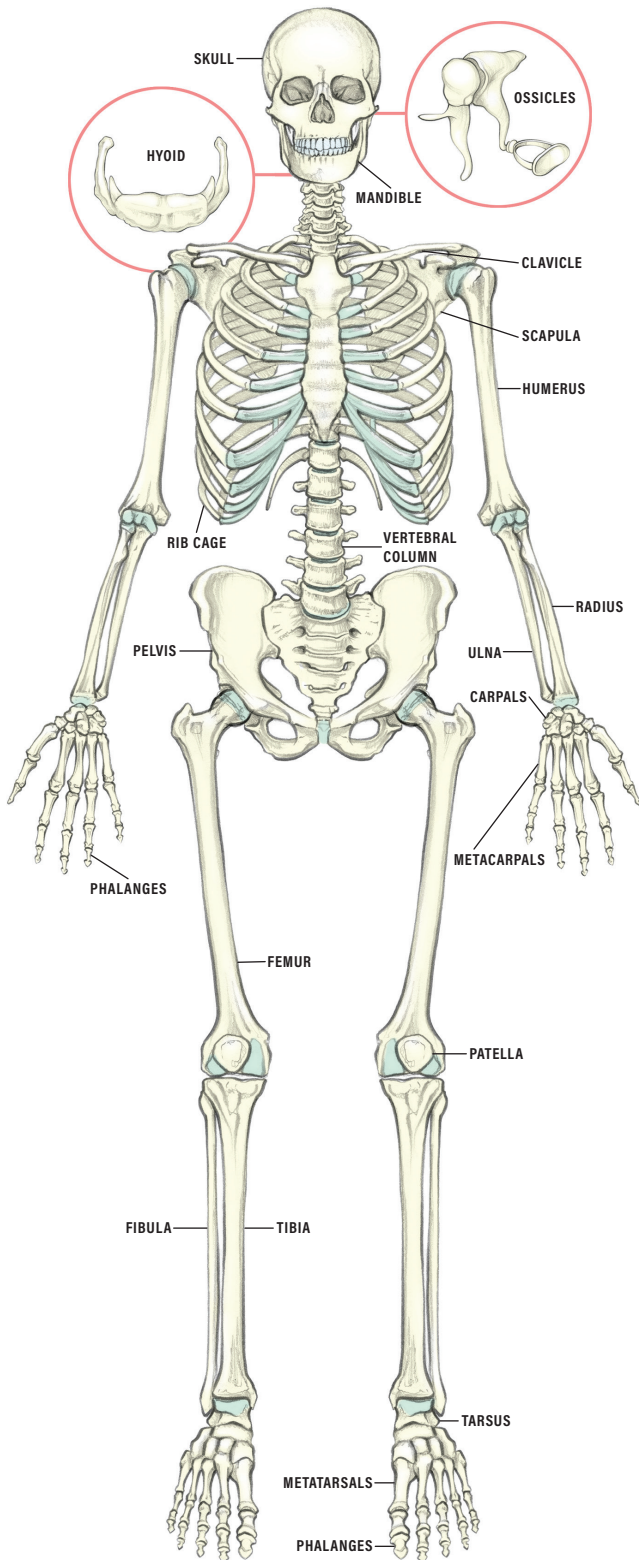
Tarsus: the collection of seven rocklike bones in each foot

Metatarsals: the small bones of the foot distal to, or beyond, the tarsus

Phalanges: the toe bones⁵

To move our bodies, our muscles pull on these bones and leverage movement across the joints in three planes: the sagittal, the coronal, and the transverse.

5. Otherwise known as piggies.



Sagittal Plane

Think of a vertical line that could cut you into right and left pieces. This could be a line right down your very center (midsagittal) or an off-center line cutting you into uneven right and left halves.⁶ Movements along this plane are called flexion and extension.

Flexion: Movement that decreases the angle between the two parts at the joint. Bending your elbow or your knees when you're sitting down are good examples of flexion.

Extension: Movement that increases the angle between the two parts at the joint. The back leg in a lunge is in extension at the hip. When your elbows and knees straighten, or when you arch your neck to look up at the moon, these body parts are in extension.

The phrase *double jointed* usually refers to a joint that moves beyond its normal limits. The terms *hyperflexion* and *hyperextension* (the prefix *hyper-* means “over” or “beyond”) describe the movement of these joints. Joints that move these ways could be due to how the bones fit together

⁶ Like a deli slicer. Again, not a serial killer. I promise.