

the **CrossFit** JOURNAL ARTICLES

Anatomy and Physiology for Jocks

Greg Glassman

Effective coaching requires efficient communication. This communication is greatly aided by coach and athlete sharing a terminology for both human movement and body parts.

We've developed an exceedingly simple lesson in anatomy and physiology that we believe has improved our ability to accurately and precisely motivate desired behaviors and enhanced our athletes' understanding of both movement and posture.

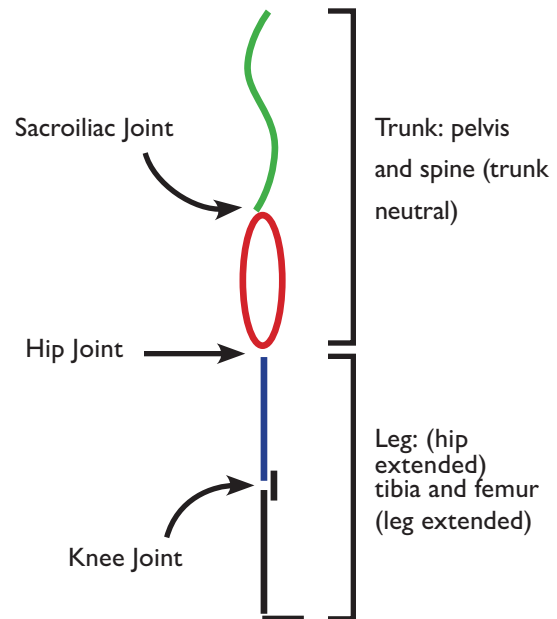
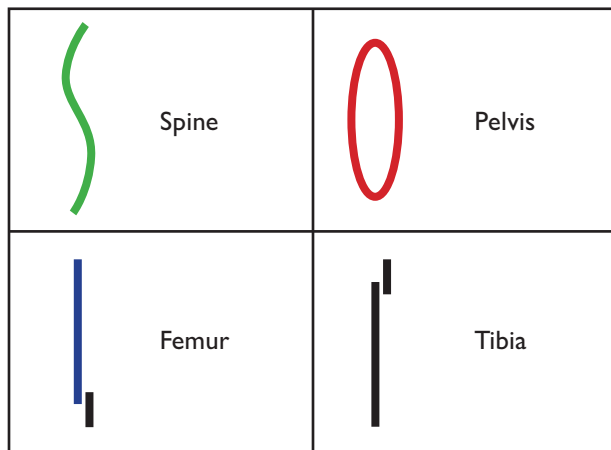
Basically, we ask that our athletes learn four body parts, three joints (not including the spine), and two general directions for joint movement. We cap our A&P lesson with the essence of sports biomechanics distilled to three simple rules.

We use a simple iconography to depict the spine, pelvis, femur, and tibia. We show that the spine has a normal "S" shape and where it is on the athlete's body. We similarly demonstrate the pelvis, femur, and tibia.

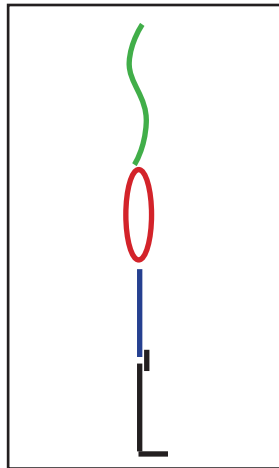
We next demonstrate the motion of three joints. First, the knee is the joint connecting tibia and femur. Second, working our way up, is the hip. The hip is the joint that connects the femur to the pelvis. Third, is the sacroiliac joint (SI joint), which connects the pelvis to the spine. (We additionally make the point that the spine is really a whole bunch of joints.)

We explain that the femur and tibia constitute "the leg" and that the pelvis and spine constitute "the trunk."

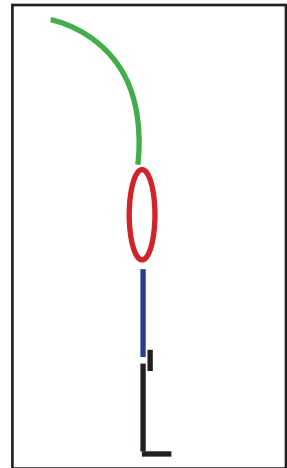
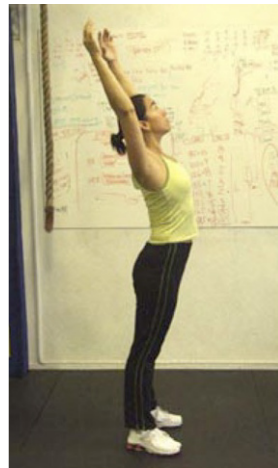
That completes our anatomy lesson – now for the physiology. We demonstrate that "flexion" is reducing the angle of a joint and that "extension" is increasing the angle of a joint.



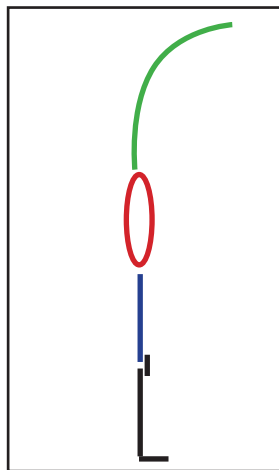
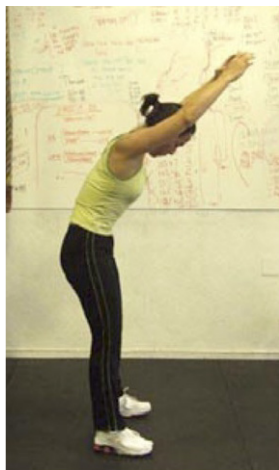
Anatomy and Physiology (continued...)



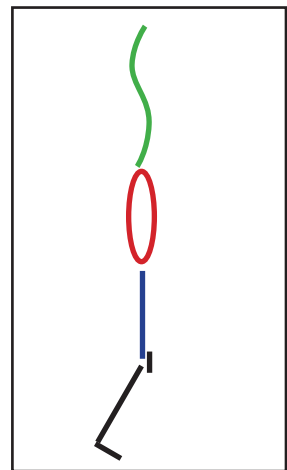
Trunk neutral, hip extension, leg extension



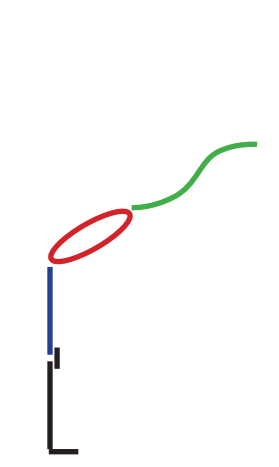
Trunk extension



Trunk flexion



Leg flexion



Hip flexion

Anatomy and Physiology (continued...)

Before covering our distillation of essential biomechanics we test our students to see if everyone can flex and extend their knee (or “leg”), hip, spine and sacroiliac joint (or “trunk”) on cue. When it is clear that the difference between flexion and extension is understood at each joint we cue for combinations of behaviors, for instance, “flex one leg and trunk but not your hip”.

Once the joints, parts, and movements are clear we offer these three tidbits of biomechanics:

- Functional movement generally weds the spine to the pelvis. The SI joint and spine were designed for small range movement in multiple directions. Endeavor to keep the trunk tight and solid for running, jumping, squatting, throwing, cycling, etc. *3 of 3*
- The dynamics of those movements comes from the hip – primarily extension. Powerful hip extension is certainly necessary and nearly sufficient for elite athletic capacity.
- Do not let the pelvis chase the femur instead of the spine. We’ve referred to this in the past as “muted hip function” (*CFJ* issue 05, January 2003). We also call it “frozen hip” because when the pelvis chases the femur the hip angle remains open and is consequently powerless to extend.

Four parts, three joints, two motions, and three rules give our athletes and us a simple but powerful lexicon and understanding whose immediate effect is to render our athletes at once more “coachable.” We couldn’t ask for more.



Greg Glassman is the Founder of CrossFit, Inc. and Crossfit Santa Cruz and is the publisher of the CrossFit Journal. He is a former competitive gymnast and has been a fitness trainer and conditioning coach since the early 1980s.

