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# Low Back Health: The Importance of the Individual with Lifting Mechanics

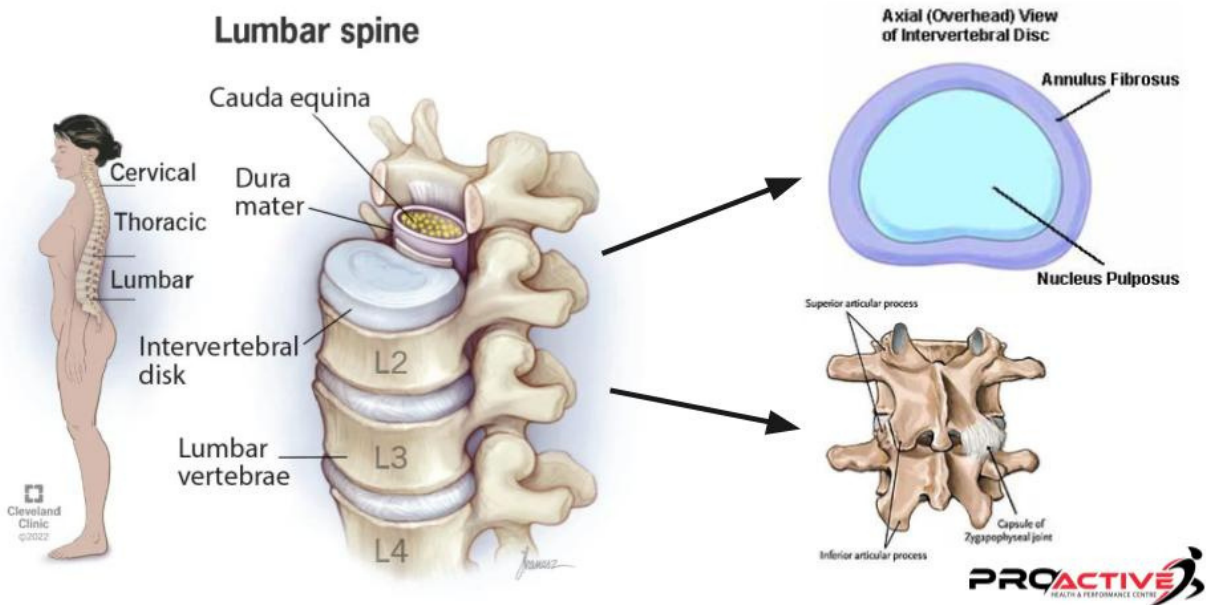
*with Dr. Chad Anderson*



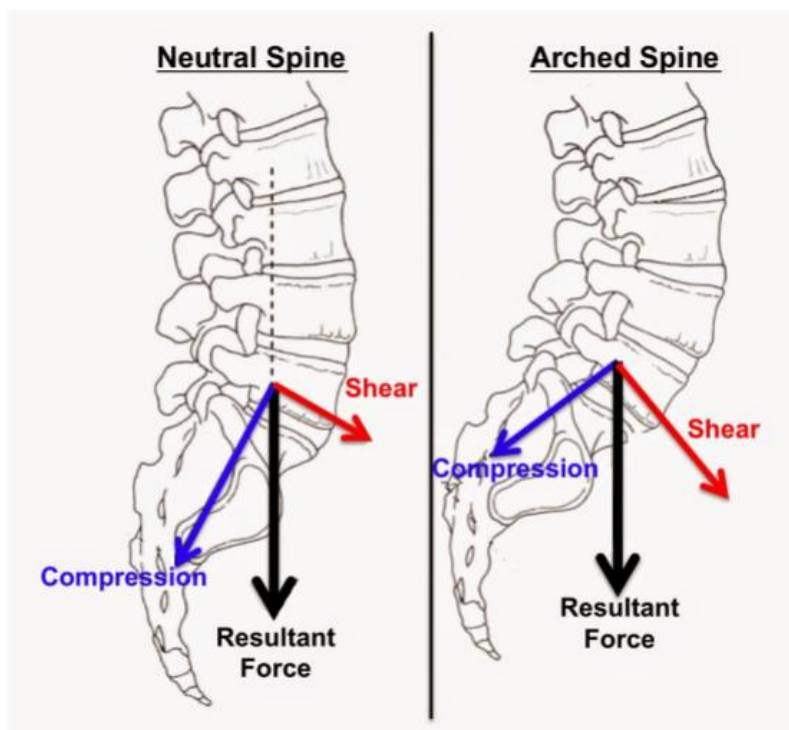
Our population has a prevalence of low back pain annually of 10-30% and 65-85% lifetime. The good news is that up to 90% of these individuals recover in 3 months. The bad news is that 65% of these people will report low back pain again within 12 months of recovery. I state these statistics to show that low back pain is complicated to treat and complex to prevent, if truly preventable at all.

Within our clinic, we typically deal with training or sports injuries. These types of injuries can be harder to predict because of the variability of the movements in a sporting event or training session. When we relate low back pain to movement patterns, we typically think of a flexion-based injury. This would be someone that flexes too much during an activity, for example lifting a loaded barbell in a deadlift. However, over-extension is just as common as these over-flexion injuries, especially among athletic individuals.

Two structures take the forces of our body, we have our intervertebral discs (IVD), which lie between each spinal segment and we also have the facet joints that link our spinal segments together. These structures are subjected to four types of loads, compressive, distraction, torque and shear, but I'd like to focus on two of them: shear forces and compressive forces.

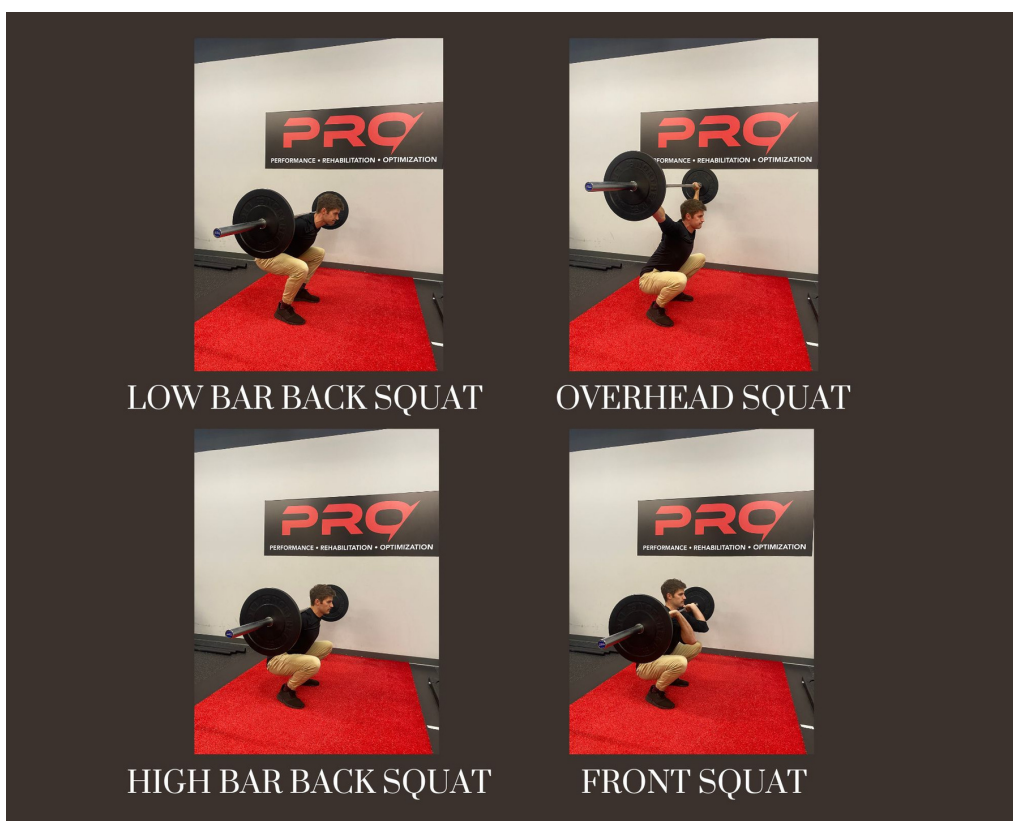


When someone is in a neutral spine position with no external load, typically there is a significant force that is put onto our IVDs and a smaller force onto our posterior elements. When we arch our spine, the force into our IVDs goes down but the force into our posterior elements increases. The magnitude of these forces will change based on the individual. We all do not live in a neutral spine position, some of us are in a more flexed position at rest and others are more in an extended position at rest. We could define these individuals as someone who lives in a posteriorly tilted pelvis = flexed position or anteriorly tilted pelvis = extended position or a neutrally tilted pelvis. An individual with a posteriorly tilted pelvis undergoes more compressive forces and fewer shear forces. An individual with an anteriorly tilted pelvis undergoes more shear forces than compressive. Compressive forces affect IVDs more than the facet joints, whereas shear forces affect facet joints more than IVDs.



Now if we add an external load as we do in a squat or deadlift, this substantially increases the forces on the spine. If you take these external loads and combine them with someone who lives outside the neutral spine, we could get an increase in these compressive and/or shear forces. This should be in consideration when we look at an athlete's training program. Based on the individual, the change of position of where we load the weight in a squat or deadlift can increase or decrease the force into the low back.

Front squat, the weight in front of our body and can create more shear forces, which could affect an anteriorly tilted pelvis more. Back Squat, the weight being more behind us, can create more compressive forces which could affect a posteriorly tilted pelvis more. There are many other examples of how changes in weight position can affect the load on the body, even though the individual is performing the same movement.



As mentioned at the beginning, it is very difficult to predict an injury. A well-trained individual may be able to withstand the forces of training or sports that allow them to be injury-free, however many do not. We must understand that everyone is an individual and that what works for one person, might not work for another. And at the end of the day, even if you did everything with your best effort an injury may still happen. We can't fully predict injuries but we can keep trying to do our best!

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