

## Biomechanics of Sports

# **Biomechanical Terms and Concepts**

## **Common Injuries in Sprinting**

**May 1, 2020**



## Lesson: May 1, 2020

**Objective/Learning Target:** Identify, understand, and provide prevention techniques for common injuries associated with sprinting and running.



## Lesson: May 1, 2020

**Background Information:** Injuries can be one of the most detrimental things to an athlete's career or someone's ability to get quality exercise in. It is important to understand what is causing pain in your running and what to do about it. Over the next two days you will investigate multiple athletic injuries common with running and sprinting.



## Lesson: May 1, 2020

**Warm-Up Activities:** Identify the region of the body where the hamstrings muscle group and lower back are located?  
How are these areas related?



## Lesson: May 1, 2020

**Instructions:** Read the information below to identify the similarities between these two injuries associated with sprinting and running. When finished reading the notes answer the questions below.



<https://www.acefitness.org/fitness-certifications/ace-answers/exam-preparation-blog/3594/muscles-that-move-the-leg/>



**Excessive forward lean when running.** If the spine is too far in front of the body it causes an elongated propulsion phase which increases the chance of hamstring injuries.

**Tight hamstrings.** While the leg cycles through and goes into max hip flexion then extends out in front of the body there is a lot of range of motion required out of the hamstrings. If the hamstrings do not have the range of motion, injuries can happen during this phase.

**Unstable hamstrings** or when **the hamstrings get to or close to max range of motion**, they become shaky or begin to tighten up/cramp you are more at risk for hamstring problems.



Likewise, **a shortened propulsion phase** causes early knee flexion putting additional pressure on the hamstrings.

**Limited extension range of motion** in the lower back and/or **limited glute max activation capabilities.**

## HAMSTRING INJURIES

Hamstring strain/pull happens when one or more of these muscles gets stretched too far and starts to tear





# BACK PAIN

Lower back pain refers to any pain, stiffness or decreased movement of the lower back and may result in difficulty standing straight

Big forward lean when running, limited ability to drive knees up.



Excessive external rotation in the leg when landing. Puts extra force into the hips which radiates up into the lower back. (Sciatica)

Excessive lateral tilt in the hips causing lower back to overcompensate.

Excessive propulsion phase or foot gets stuck behind body.



Unnatural amount of extension in the lower back when running, causing it to look like. Usually caused by weakness in the lower core or hip flexors.







## Questions:

1. Compare the differences in lower back pain and hamstring injuries during the propulsion phase?
2. What similarities in running mechanics may lead to injury in both lower back and hamstrings?
3. During hip extension what muscle group is your primary mover?
4. How might the muscle group from question 3 affect both the hamstrings and lower back?



Email your discussion questions to the following instructors:

[jay\\_kolster@idschools.org](mailto:jay_kolster@idschools.org)

[Tyler\\_rathke@idschools.org](mailto:Tyler_rathke@idschools.org)

[Marcus\\_Summers@idschools.org](mailto:Marcus_Summers@idschools.org)