

# Effect of Eccentric Rehabilitation Training on Preventing Hamstring Strain Recurrences in Power Athletes

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## Abstract

Hamstring injuries (HSI) are one of the most common injuries seen in athletes that play power sports. Due to the nature of recurring sport-specific movement, not only do the injuries occur often, but they also have a high recurrence rate. There are various methods used to treat HSI. Eccentric training (ET) has been seen to be one of the best ways to treat HSI, but not everyone uses this method. There is a need for a universal hamstring rehabilitation program, and a need to reduce the recurrence rate of HSI. This study sought to find answers for the gaps in the literature. The results of this study would analyze if eccentric rehabilitation training after a HSI could help reduce the recurring rate of HSI in power athletes.

## Introduction

- HSI are the most commonly seen injuries in power athletes.
- Recurrence rate for HSI occurs within 24 hours to two weeks of the initial injury.
- Soccer, track and field, and American Football have the highest injury rates (Dalton, Kerr, Dompier, 2015).
- ET is beneficial for rehabilitation due to strength development capabilities (Hoffman, 2002).
- A gap in the literature exists in finding an effective HSI rehabilitation program and how it will prevent it recurrence of multiple strains in power athletes.

## Purpose

- The purpose of this study was to analyze the effect of an ET rehabilitation program on preventing recurring HSI in power athletes.
- It was hypothesized that using an ET rehabilitation program will reduce the rate of HSI.

## Operational Definitions

- Hamstring strain (HSI): a tear in one or more hamstring muscles (Pull, Ranson, 2006).
- Power athletes: those who use speed to display maximal force
- Eccentric training (ET): slow and controlled exercises that challenge the muscles in a lengthened state (Tyler, Schmitt, Nicholas, McHugh, 2017).

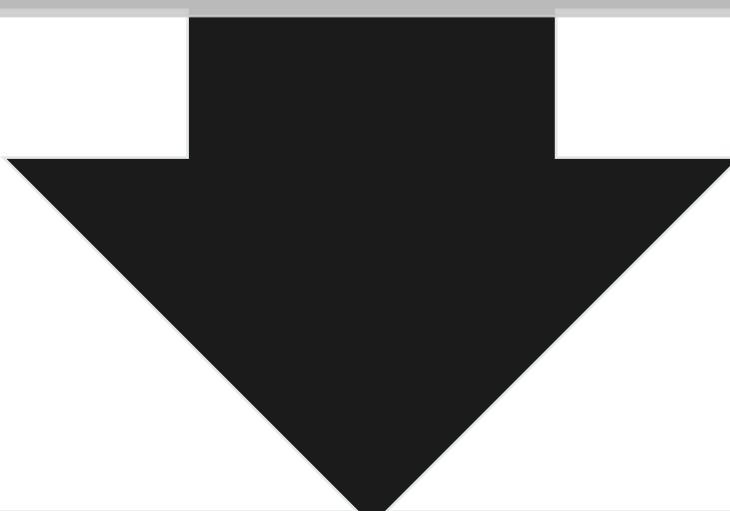
## Participants

Control (n=100)	Experimental (n=100)
- No previous history of HSI or lower limb injury	- MRI diagnosed HSI
- At least 1 year experience in resistance training	- Grade I or II HSI
	- At least 1 year experience in resistance training

## Methods

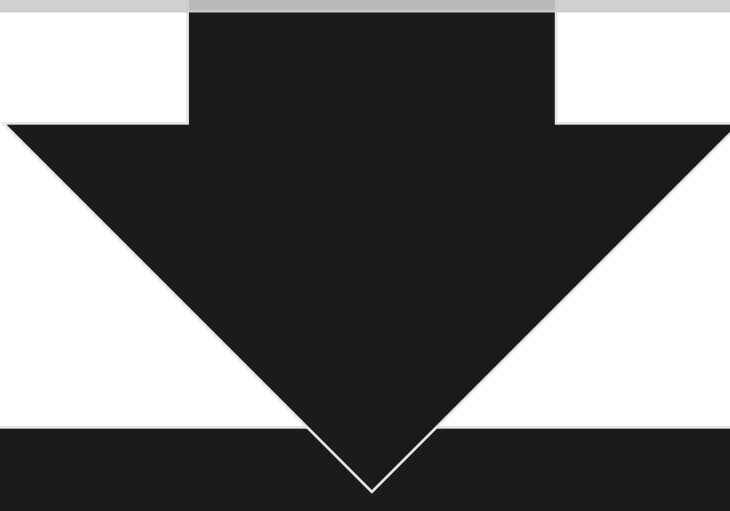
### Research Design

Quantitative research  
Survey instrumentation given to both groups after every session



### Procedure

Experimental group completes phase one  
Pre-test for both groups  
Both groups complete phase two of program  
Post-test for both groups  
Follow-ups for experimental group at 2 weeks, 3 months, 6 months



### Data Analysis

Left/right limbs and injured/uninjured limbs compared for strength differences  
Considered significant if  $p < 0.05$

## Rehabilitation Protocol

Phase One:

Time	Procedure
Immediately post injury	MRI confirming injury and injury grade
	Conduct PRICE (Protect, Rest, Ice, Compress, Elevate)

Phase Two:

Week	Sessions per week	Sets x reps
1	1	2x5
2	2	2x6
3	3	3x6
4	3	3x8

## Implications

These findings will contribute with closing the gap in the literature on whether ET is useful for preventing recurring hamstring strains. Future research should be done to see whether ET will help reduce all HSI, and if the rehabilitation program will be useful for all athletes.

## Acknowledgements

I would like to thank the participants for completing the study along with the Athletic Trainers who helped supervise the program. I would like to thank Dr. Hartman and Dr. Granniss for educating me and providing feedback for the study as well as peer reviewers Eric Jones and Karlee Moore.

## References

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