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## Vestibular Post Concussion Therapy: Using Sports-Related Activities After Passing the Impact Test

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## ***Vestibular Post Concussion Therapy: Using Sports-Related Activities After Passing the Impact Test***

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### **OBJECTIVE**

To compare the NCAA Concussion Protocol to Vestibular Sports Related Therapy rehabilitation on concussions.

### **SUBJECT SELECTION**

In this study, there were four total participants. Individuals were between the ages of 18 and 26 and attended Muskingum University. Requirements for participation included playing a NCAA sport, being diagnosed with a concussion by team physician and passing the ImPACT test (further described in the procedures section below). Athletes were assigned randomly to either the NCAA Concussion Protocol group or the VSRT group. Participants who sustained more than 3 concussions were excluded from the study. All genders and ethnicities were encouraged to participate. The study was reviewed and approved by the university's Human Subjects Review Board and a written form of consent was obtained from each participant.

### **PROCEDURES**

#### ***ImPACT Test***

When athletes were diagnosed with a concussion and were asymptomatic, they were given the ImPACT test, a computerized concussion exam. All athletes had to pass the ImPACT test before they could take the post-concussion baseline reaction exam.

#### ***Reaction Test***

The reaction test consisted of a stick connected to a hockey puck that dropped at a random time, was predetermined. The

athletes had to catch the stick as fast as they could to get a baseline reaction time. Their reaction time was recorded after the ImPACT Test and after three full practices being asymptomatic.

#### ***NCAA Protocol***

NCAA has made a protocol for medical professionals to follow after an athlete is diagnosed with a concussion. Athletes have to finish each step without reoccurring symptoms before they are able to return to full participation.

#### ***Vestibular Sports Related Therapy (VSRT)***

VSRT is a combination of vestibular therapy and sports related activity to insure the athlete's brain is ready to return to play and be used as a rehabilitation. The vestibular therapy used in the study was from the Brain and Spine Foundation combined with sports related rehabilitation from the primary investigator.<sup>4</sup>

### **RESULTS**

Statistical Package for the Social Sciences (SPSS), was the data analysis tool that was conducted to find results. The analysis conducted was an Independent Samples t Test. The Independent Samples t Test compares the means of two independent groups in order to determine whether there is statistical evidence that the associated population means are significantly different. The Independent Samples t Test is a parametric test which compared the participants in the NCAA protocol and the

participants in the VSRT. There was no significant difference between NCAA protocol and the VSRT,  $t(2)=3.11$ ,  $p= .089$ .

### **CONCLUSION**

Research in the prevention of concussions is very important to try to limit brain injury, but concussions are not preventable. Concussions will happen and is happening to 10,560 athletes a year in the NCAA.<sup>1</sup> In the course of a musculoskeletal injury, athletes go through weeks of rehabilitation after the resting and healing phases are over. The NCAA protocol has six steps that can take only a week for the athletes to begin full participation. This study was conducted to see if more cognitive rehabilitation would in fact increase cognitive abilities by testing reaction time. There were no significant difference between the groups,  $t(2)= 3.11$ ,  $p= .089$ . There were only four subjects which limited the results. The average difference from the pre and post-test for the NCAA protocol was .85cm. The

difference of the pre and post-test vestibular sports related rehab was 4.0cm. . Even though there was a numerical difference between the groups the statistics were not significant enough to state there was a difference. To be significant in nature the amount of subjects needs to increase to get a more conclusive result.

### **REFERENCES**

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**KEY WORDS:** *concussion, rehabilitation, vestibular, therapy, Reaction Test, NCAA, sports*