

## Force dissipating effects of properly and improperly worn concussion helmets

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**Study Design:** Experimental design

**Objective:** The purpose of this study is to analyze the force dissipating effects of properly and improperly fitting football helmets.

**Methods:** The study is based upon a model utilized in a recent National Football League study. The National Football League study affixed multiple sensors inside of football helmets at six key locations. The helmets were padded well to ensure that the acceleration detected was the result of head acceleration not helmet acceleration. An impactor instrumented with an accelerometer then struck the helmet instrumented with a thin-film piezo-sensor and placed atop a plaster of paris head mold. The accelerometer measured the linear acceleration of the impactor. The thin film piezo-sensors affixed to the helmet directly measured the force translated from the impactor to the helmet and labview readouts were utilized to calculate acceleration and force measurements

**Results:** The results of this study demonstrate that helmet fit significantly affects acceleration and force translation. This information may be used to help adolescent football players and coaches to make informed equipment choices aimed at reducing the risk of neurological injury in educationally sanctioned sporting events.

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