



## Parametric study of closed head injuries

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In this paper, a two-dimensional finite element model was constructed and used to study several factors affecting closed head injuries (CHI). The finite element model was constructed using magnetic resonance images to faithfully represent the geometry and material properties of the head. The investigated factors include: cranial elasticity modulus, duration of impact and contact area of impact. The maximum peak values of mechanical responses were used to measure the effects of the investigated factors. From the obtained results, we observed that these factors have considerable influence on strain fields in the brain and stress fields in the skull. By increasing either cranial elasticity modulus, or impact duration, or contact area of impact, the maximum peak strains in the brain can be significantly reduced. But this trend does not continue when these factors rise to a certain level. Further increase will not lead to any additional reduction. Conclusions obtained from these investigations may be helpful for improving protective devices such as helmets.

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