

# Simple Strategy to Prevent Severe Head Trauma in Judo —Biomechanical Analysis—

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## Abstract

To determine whether the use of an under-mat has an effect on impact forces to the head in Judo, a Judo expert threw an anthropomorphic test device using the Osoto-gari and Ouchi-gari techniques onto a *tatami* (judo mat) with and without an under-mat. Head acceleration was measured and the head injury criterion (HIC) values with or without under-mat were compared. The use of an under-mat significantly decreased ( $p = 0.021$ ) the HIC values from  $1174.7 \pm 246.7$  (without under-mat) to  $539.3 \pm 43.5$  in Ouchi-gari and from  $330.0 \pm 78.3$  (without under-mat) to  $156.1 \pm 30.4$  in Osoto-gari. The use of an under-mat simply reduces impact forces to the head in Judo. Rule changes are not necessary and the enjoyment and health benefits of Judo are maintained.