

## **FALLING INTO LINE: EYE TESTS AND IMPACT MONITORING IN STUNT PERFORMERS**

**Purpose:** Concussion in sport is an increasingly controversial subject. Despite advances in our understanding, a large degree of subjectivity clouds decision-making. Testing ocular saccades has been shown to detect changes in concussion following sporting head impacts. Stunt performers face similar high impacts but have not been previously studied. We aimed to quantify head impacts in stunt performers via a wireless head impact sensor, assess changes in ocular saccades using the King Devick Test (KDT).

**Methods:** Data on impact magnitude were collected with two wireless head impact sensors (X Patch, X2 Biosystems and Triax by Tritec) worn by 4 stunt performers, with no previous history of concussion. Each participant undertook back-falls from platforms at 3 and 4.1 meters above standard stunt mats: hard, soft and soft mat over cardboard boxes. The KDT was performed pre-session and after two falls from each height into each mat type.

**Results:** Impacts from 23 to 89g with rotational acceleration up to 15,0000 rads/Sec/Sec were recorded. Mats covering boxes significantly decreased the impact forces recorded. KDT scores for saccadic speed were significantly slower after falls into the harder mats and from greater heights.

**Conclusion:** Changes in ocular saccadic tests are seen in stunt performers after controlled falls from height. A combination of regular KDT and impact monitoring provides objective identification of potentially concussive impacts. Maximum limits based on cumulative force of impacts and deterioration in objective measures such as KDT could be of benefit in reducing risk of long term mild traumatic brain injury.