Discussion regarding a new study recently completed by Bryan Pfister, PhD, a specialist in neural tissue engineering and bio-dynamics. The study supports the findings by Exponent, the BIA, and Neuro-Med.

Low Risk of Traumatic Brain Injury from Roller Coaster Rides, Researcher Says June 28, 2010

With July 4th around the bend, if you've ever feared a head injury from a roller coaster ride, it's time to stop worrying and enjoy your local amusement parks. Although a significant body of scientific research has long contended that the physics behind gravitational force isn't enough to cause problems, misconceptions have abounded anyway, said Bryan Pfister, PhD, an assistant professor in the department of biomedical engineering at NJIT.

Pfister recently set out to disprove such misconceptions in his paper "Head Motions While Riding Roller Coasters: Implications for Brain Injury," (The American Journal of Forensic Medicine and Pathology, Dec. 2009). The paper makes the case that "there appears to be an extremely low risk of traumatic brain injury (TBI) due to the head motions induced by roller coaster rides."

"The risk of TBI while riding roller coasters has received substantial attention. Case reports of TBI around the time of riding roller coasters have led many medical professionals to assert that the high gravitational forces (G-forces) induced by roller coasters pose a significant TBI risk.
Head injury research, however, has shown that G-forces alone cannot predict TBI," said Pfister.

"Unfortunately, many professionals have incorrectly used G-force measurements to dramatize the risk of head injury on a roller coaster ride.
Indeed, their misinterpretation would also conclude that it is too dangerous to drive a car.

While the exposure to G-forces on roller coasters appears high, it is not more that what you would experience in many everyday activities."

Pfister used established head injury criterions and procedures to compare the potential of TBI between daily activities and roller coaster riding.
Three-dimensional head motions were measured during three different roller coaster rides, a pillow fight, and car crash simulations.

Data was analyzed and compared with published data, using similar analyses of head motions. An 8.05 m/s car crash lead to the largest head injury criterion measure of 28.1 and head impact power of 3.41, over 6 times larger than the roller coaster rides of 4.1 and 0.36. Notably, the linear and rotational components of head acceleration

during roller coaster rides were milder than those induced by many common activities.

Pfister, a specialist in neural tissue engineering, received in 2007 a prestigious Faculty Early Career Development Award from the National Science Foundation to support and expand his research into rapid axon stretch growth, a technique for regenerating damaged or diseased nerve cells. He received his doctorate from Johns Hopkins University.

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