Brain Simulation Research Platform

Single Event Prediction Overview

Jack 100 Player

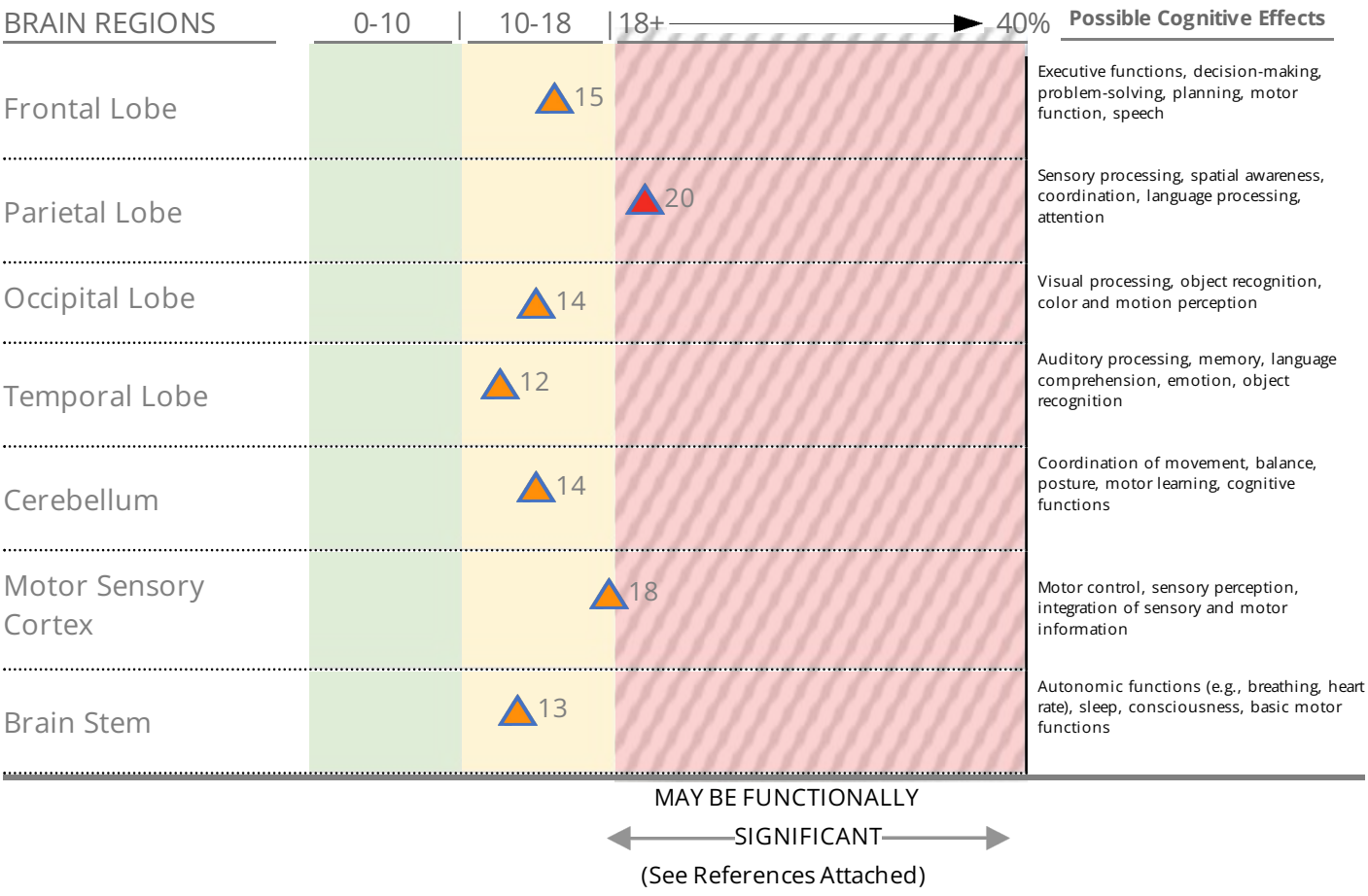
Sensor ID : 9667	Impact Date : 11-09-2019	Organization : DemoOrg	Team : Testing
Impact ID : 1080	Account ID : 5510225708	Event ID : PPBWmn	Impact Time : 2:49:39 PM

Maximum Principal Strain (MPS) is a measurement of how much the brain tissue stretches or is compressed in a shearing motion. Scientists believe that too much strain in the tissue may be harmful. An analogy is a sprained ankle when the tough bands of tissue (ligaments) are stretched too far or tear.

95th Maximum Principal Strain = 10.60%

The 95th maximum principal strain is obtained from ranking the principal strains throughout the entire brain and selecting the strain value in the 95th percentile. It is a more robust value compared to maximum principal strain.
The maximum principal strains are provided for each region below.

Maximum Principal Strain In Each Region (%)



Prediction made with FEMTech Branch: develop, Hash: e05922f.

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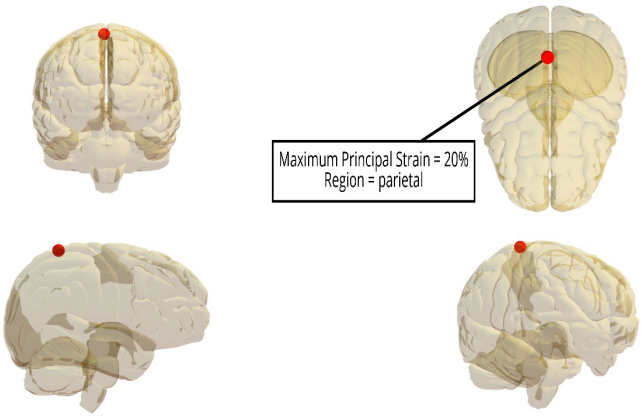
Maximum Principal Strain



95th Percentile Maximum Principal Strain (95 MPS)

Locations of tissue above 95 Percentile Maximum Principal Strain

Small	Medium	Large	X-Large
<10%	10-18%	>18-30%	>30%

Strain Metric Magnitudes*

*See references on Page 4 for metric information.

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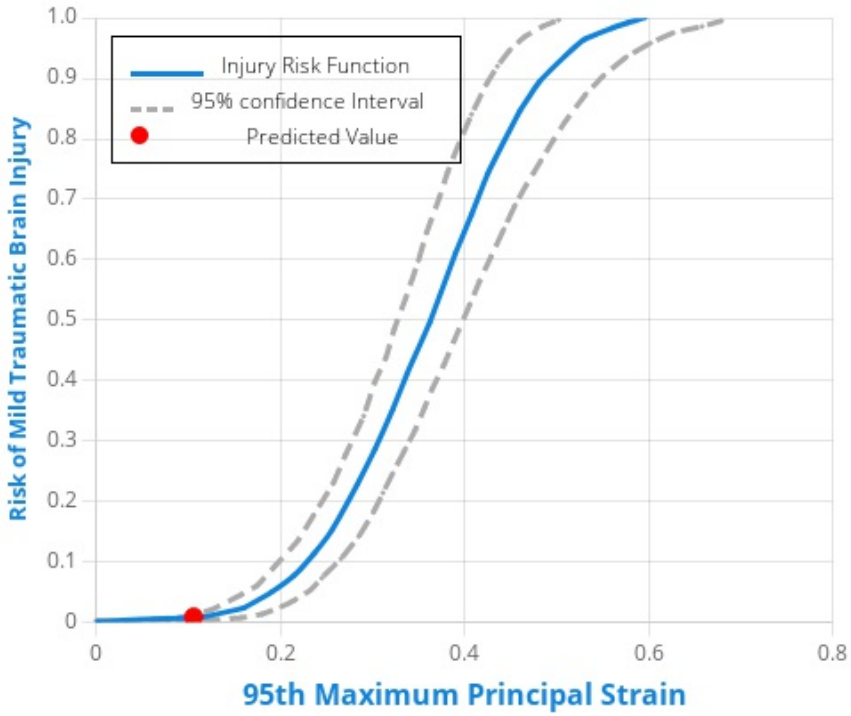

Wu, T., Sato, F., Antona-Makoshi, L., Gabler, L. F., Giudice, J. S., Alshareef, A, Yaguchi, M., Masuda, M., Margulies, S.S., and Panzer, M. B. (February 15, 2022). "Integrating Human and Nonhuman Primate Data to Estimate Human Tolerances for Traumatic Brain Injury." ASME.J Biomech Eng. July 2022: 144(7): 071003. https://doi.org/10.1115/1.4053209

References :

Several peer-reviewed scientific papers highlight the significance of brain strain as an indicator of brain injury. A few references include:

1. Bain AC, Meaney DF (2000) Tissue-level thresholds for axonal damage in an experimental model of central nervous system white matter injury. J Biomech Eng 122: 615–622.

2. Zhang, L., Yang , K. H., and King, A. I. (May 4, 2004). "A Proposed Injury Threshold for Mild Traumatic Brain Injury ." ASME. J Biomech Eng. April 2004; 126(2): 226–236. https://doi.org/10.1115/1.1691446.

3. Kleiven S. Predictors for traumatic brain injuries evaluated through accident reconstructions. Stapp Car Crash J. 2007 Oct;51:81-114. PMID: 18278592.

4. Wu, T., Sato, F., Antona-Makoshi, J., Gabler, L. F., Giudice, J. S., Alshareef, A., Yaguchi, M., Masuda, M., Margulies, S. S., and Panzer, M. B. (February 15, 2022). "Integrating Human and Nonhuman Primate Data to Estimate Human Tolerances for Traumatic Brain Injury." ASME. J Biomech Eng. July 2022; 144(7): 071003. https://doi.org/10.1115/1.4053209