



US DEPARTMENT OF DEFENSE

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

## Screening Tools

### BrainScope One

Assessment of traumatic brain injury (TBI) using objective measures is a current challenge with respect to TBI diagnostics and therapeutics. BrainScope Company, Inc. (Bethesda, Maryland) has leveraged government and non-government funding to develop the Ahead System, a hand-held, point of care device which is Food and Drug Administration-cleared to rapidly and non-invasively aid in the evaluation of patients with brain injury who may need computed tomography scans.

A next-generation platform, the Ahead-300 (now known as the BrainScope One) has been developed. The device combines quantitative electroencephalographs (qEEG) with a battery of neurocognitive assessments to evaluate post injury brain function. Researchers using the device in emergency department settings demonstrated the use of qEEG plus determination of loss of consciousness (LOC) in increasing prognostic accuracy of TBI assessment over LOC alone (*Hack et al. 2017*). The Brain Function Index (BFI) output of the BrainScope One was evaluated in a large trial (*Hanley et al. 2018*). Evaluation of post injury brain function impairment following mild traumatic brain injury (mTBI) showed that the use of the BFI correlates to the severity of mTBI (Figure 1).

In early 2017, the BrainScope One was released for commercial sales, to include a BrainScope Centers of Excellence program, a non-government program of restricted customers to direct the initial commercialization of the product, and the U.S. Military and government among early customers.

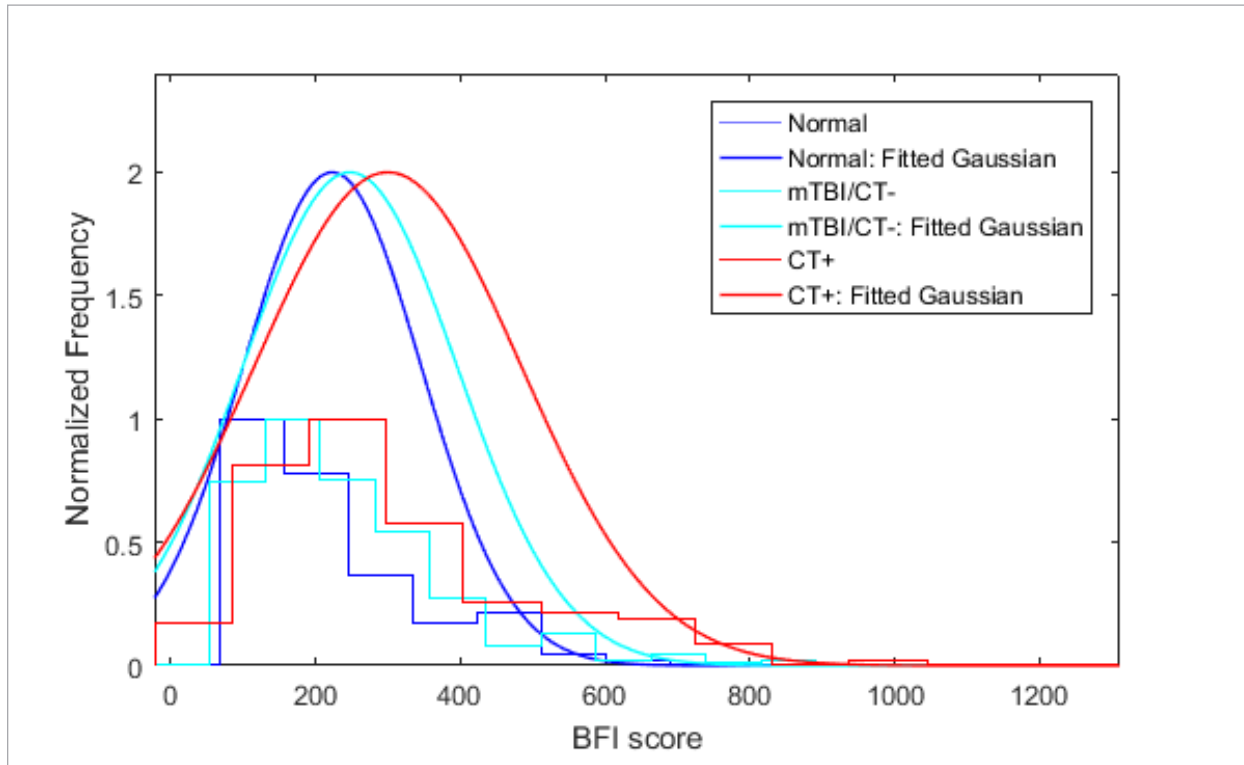
Efficient assessment and triage of injured Service members with TBI across all severities can be used to maximize and improve delivery of care in austere environments.

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**FIGURE 1:** Distributions of the BFI scores: Normal distributions fitted to BFI score to illustrate the BFI increase in response to increasing severity of brain injury. Frequencies are normalized such that each histogram has a peak value of one, and each fitted distribution has a peak value of two. (Figure from Hanley et al. (2018) used with permission from the authors)

**REFERENCES:**

Hack, D., Huff, J. S., Curley, K., Naunheim, R., Ghosh Dastidar, S., and Prichep, L. S. 2017. "Increased Prognostic Accuracy of TBI When a Brain Electrical Activity Biomarker Is Added to Loss of Consciousness (LoC)." *Am J Emerg Med* 35 (7):949-952. doi: 10.1016/j.ajem.2017.01.060.

Hanley, D., Prichep, L. S., Badjatia, N., Bazarian, J., Chiacchierini, R., Curley, K. C., Garrett, J., Jones, E., Naunheim, R., O'Neil, B., O'Neill, J., Wright, D. W., and Huff, J. S. 2018. "A Brain Electrical Activity Electroencephalographic-Based Biomarker of Functional Impairment in Traumatic Brain Injury: A Multi-Site Validation Trial." *J Neurotrauma* 35 (1):41-47. doi: 10.1089/neu.2017.5004.

