



## TBI Assessment Breakthrough for Wounded Warriors Using Capturx

Traumatic Brain Injury or “TBI” has been a serious consequence for Soldiers in combat zones, resulting from severe blows to the head from explosions and other combat related events. A Rand Corporation study reported that over 900 American Soldiers have sustained traumatic brain injuries and over 300,000 Soldiers may have suffered mild TBI, even when wearing approved ballistic headgear in combat operations. Effective screening for TBI is the critical first step for proper treatment and an important component of the Soldier Readiness Program.\*

A variety of TBI screening tests are available. Such TBI screening tests as the Clock-drawing exercise or the Trail-making exercise are simple cognitive assessments that can be performed using pen and paper. They are also powerful tools for revealing hard-to-detect brain damage. Identification is the essential prerequisite for treatment and minimizing long-term consequences.

### Summary

**Situation:** Over 300,000 Soldiers have suffered TBI. The screening for TBI is an essential component in assisting in swift diagnosis and treatment.

**Challenge:** TBI tests must be administered in person by a specialist, which slows down the testing of Soldiers and increases logistical costs.

**Solution:** Capturx software enables the same simple tests to be taken with digital pens, creating an immediate detailed digital record of each assessment.

**Results:** Capturx enables remote TBI testing, allowing teams to speed Soldier screening while reducing travel and logistical costs. Clinicians also get immediate access to much more detailed test results to improve assessments and long-term tracking.

### Challenge: Test Wounded Warriors Accurately & Quickly

The TBI test is usually performed with pen and paper by the Soldier, while a trained specialist examines how the test is performed. By observing the sequence and timing of sketches during the test, TBI specialists can detect problems that would go unnoticed by simply looking at final results. The requirement that highly trained specialists be present at all exams creates logistical challenges. Wounded warriors are consequently required to wait until a trained clinician is available to perform and observe the screening. This waiting period makes it challenging to reach the goal of testing every wounded warrior. Travel to distant clinics can also be costly and time consuming.

### Solution: Capturx Solution for the TBI Test

The Capturx software platform enables the TBI screenings to be conducted with a digital pen. Soldiers undergo traditional handwritten TBI tests using a digital pen and ordinary paper. The test paper sheets are printed on paper with a unique background pattern or watermark which the digital pen senses as the pen writes. Soldiers take the test as they normally do, using pen and paper. The time, sequence and location of their handwriting are all recorded for later replay.

Capturx enables trained TBI specialists to administer assessments remotely, giving instructions to Soldiers who can perform the test in distant locations. The digital data from the pen can be uploaded to PCs and immediately sent through email or the network to clinicians for current or later analysis.

Since the collected TBI test data contains a very detailed description of the actions, with millisecond precision, clinicians are able to recover the exact sequence of steps,

*“Technology simplifies traditional pen and paper tests. Keeping traditional TBI tests simple is critical to Soldiers who may be affected by Traumatic Brain Injury.”*

and the precise timing of every action taken during the test. A simple interface lets specialists replay each test at varying speeds as required to make accurate assessments, identifying key indicators of potential brain injury problems.

## Results: Instant Digital Records, Test More Soldiers, No Training

Just as the TBI test is simple to administer, Capturx is simple for clinical teams to use. The pen and paper process remain the same for Soldiers. The clinical teams get an immediate detailed digital record of the test which enables remote assessments, replay, and more detailed analysis.

Soldiers are not required to learn new tools and techniques to take the test, clinicians can be assured that they are observing reliable results performed directly by the Soldiers. Keeping traditional TBI tests simple is critical to Soldiers who may be affected by Traumatic Brain Injury.

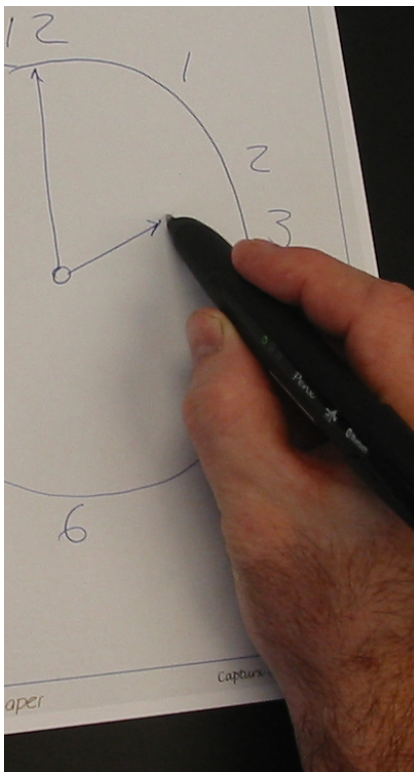
Capturx software automatically records the test data with high precision. There is limited need for critical personnel, such as highly trained specialists to be present for each test. Soldiers in remote locations can be tested simultaneously, broadening the coverage of assessments and speeding up the overall process.

Capturx keeps track of which Soldier took the test by automatically associating the page and the pen that were used with a specific Soldier identification. Once a Soldier has completed the test, the pen is simply docked to a PC or laptop.

Capturx Software does the rest to download the digital data. Conversely Soldiers could take the tests in their own homes or other convenient locations at a distance from the clinic, avoiding the difficulty and expense of travel. Test data is accessible by the clinicians from their own location afterwards. Digital test data can be replayed repeatedly, and re-examined multiple times by as many specialists as required. Because the Capturx test procedure is repeatable, clinicians can pinpoint and review aspects of importance, or consult other specialists.

## Summary

Capturx increases the TBI specialist's ability to test every wounded warrior, even in remote locations, making optimal use of time, money and critical staff resources. Capturx software and digital pens simplify this essential screening procedure for soldiers, speeding up diagnosis and treatment. Clinical teams are able to more efficiently provide better care to wounded warriors.



Soldier using digital pen technology to perform the Clock-drawing exercise.