Instrumented Cane Can Determine Patients’ Fall Risk

An instrumented cane designed by Vanderbilt University engineers not only provides added support for individuals, but can also analyze their gait to determine risk of falling. The “IntelliCane” can quantitatively calculate falling risk as accurately as a physical therapist.

Currently, physical therapists estimate falling risk by observing the patient walking back and forth between two lines under a variety of conditions (e.g., slow and fast, looking right and left, stepping over obstacles). The therapist then uses a standardized rating scale to evaluate how steady the patient is on each task, and combines the ratings into an overall risk estimate. However, this test cannot always capture a patient’s full experience throughout the day, from day to day, or within their usual environment.

The IntelliCane works by collecting real-time data while individuals are walking. Data are fed into an algorithm that analyzes the sensor data and extracts information about the steadiness of the user’s gait. Engineers tested the system with nine patients, determining that they could predict each patient’s fall risk with a high degree of confidence. With more advanced analysis, the IntelliCane might even be capable of providing detailed enough information to enable diagnosis of specific diseases that affect an individual’s sense of balance.

Blood Test Can Indicate Concussion in Adults

The U.S. Food and Drug Administration (FDA) permitted marketing of the first blood test to evaluate mild traumatic brain injury (mTBI), commonly referred to as concussion, in adults. Most patients with suspected head injury are examined using a neurological scale followed by a computed tomography (CT) scan of the head to detect brain tissue damage. However, many patients evaluated for concussion do not have detectable intracranial lesions after a CT scan. Availability of a blood test for concussion will help health care professionals determine the need for a CT scan in patients suspected of having mTBI, helping prevent unnecessary neuroimaging.

The blood test, called the Banyan Brain Trauma Indicator, works by measuring levels of proteins that are released from the brain into the blood and measured within 12 hours of head injury. Levels of these blood proteins after concussion can help predict which patients may or may not have intracranial lesions visible by CT scan. The FDA evaluated data from a multicenter, prospective clinical study of 1,947 individual blood samples from adults with suspected mTBI and reviewed the product’s performance by comparing the blood test results with CT scan results. The Brain Trauma Indicator was able to predict the presence and absence of intracranial lesions on a CT scan 97.5% and 99.6% of the time, respectively.