

Background: Delirium is the most prevalent psychiatric disorder found in the general medical setting. It is associated with increased morbidity and mortality, increased healthcare costs, and a range of other negative outcomes among medically ill patients. While several validated tools are currently used to screen for delirium in the hospital setting, studies have shown that delirium is misdiagnosed or not detected in over 50% of cases across various healthcare settings, up to 85% in the ICU. This may partly be due to the reliance of these validated tools on the patient's report of symptoms or their active participation on the delirium screening tool itself. We postulate that developing a screening tool relying on the observations of nursing staff throughout their nursing shift could potentially provide a more accurate and valid assessment of patient symptoms.

Methods: We developed a new tool for the recognition of delirium, the Stanford Proxy Test for Delirium (S-PTD), based on combining DSM-5 and ICD-10 delirium diagnostic criteria. The instrument was developed in collaboration with members of the nursing staff who assisted in the wording of test items prompts used in the tool. The S-PTD eliminates the need of direct patient participation in the assessment, instead, nurses complete the tool at the end of their shift; thus using the full shift nurse-patient interaction to gain the information needed to diagnose delirium.

In this study, the S-PTD was compared to a validated tool (i.e., CAM) and the “gold-standard” (i.e., a clinical neuropsychiatric assessment conducted by a Psychosomatic Medicine [PM] specialist based on DSM-5 criteria). We hypothesize that the S-PTD will have comparable diagnostic sensitivity and specificity when compared to the diagnostic gold standard and be equal or superior to other available tools. Subjects in the study were separately and blindly screened for symptoms of delirium utilizing the S-PTD (performed by the patient's nurse), the Confusion Assessment Method (CAM; performed by a PM fellow), and a clinical neuropsychiatric evaluation based on DSM-5/ICD-10 criteria (performed by PM specialist). The study was approved by the Stanford's IRB Committee.

Results: All patients admitted to the 2 study units (housing general medicine, neurology and neurosurgical patients) were approached for participation in the study. The only exclusion criteria were a patient's unwillingness to participate, or their inability to communicate effectively in English. The S-PTD was administered during the last 2-hours of the nursing shift; other measures were obtained within 1-hour of the PTD assessment. A total of 309 subjects were blindly assessed during the duration of the study. The **average age of subjects was 59.9 years** (standard deviation 19.5); with an age range of 18 – 98 years of age. Subjects were **54.5% male**. Indications for admission included brain surgery, spinal surgery, cerebral vascular accidents, cardiovascular diseases, seizures, gastrointestinal dysfunction, fever, infection, and pulmonary diseases.

A total of 58 patients (**20.9%** of the sample) **developed delirium (21 hyperactive type or 36.2% of delirious population; while 37 hypoactive delirium or 63.8%)**, as captured by the “gold standard”, a neuropsychiatric assessment based on DSM-5/ICD-10 criteria (see Fig.1). The results suggest that when a cut-off score of ≥ 4 is used, the S-PTD has a sensitivity of 79% and a specificity of 91% [with a positive predictive value: 70.0% and a negative predictive value: 94.1%] (see Fig.2 & Fig.3). PTD performed just

as well as CAM in identifying delirium, with a McNemar's Test P-Value of 0.739 (see Tab.1).

After an initial training period of 2 weeks, it took the average nurse less than 1 minute to complete the questionnaire (vs 5 min for CAM4 or 3–5 min for 3D-CAM). Nurses reported "liking" the S-PTD better than the CAM and being "more willing" to complete the S-PTD than the CAM.

Discussion & Conclusion: This is the first diagnostic tool for delirium based on DSM-5 and ICD-10 criteria. The tool is easy to use, yet comprehensive, and eliminates the problem of patient's lack or inability to cooperate in the examination. The use of observation based tools, such as S-PTD, may enhance the early recognition and diagnosis of delirium. We are currently conducting a study in the critical care units and comparing against CAM-ICU to demonstrate that the S-PTD can seamlessly work on any clinical setting.