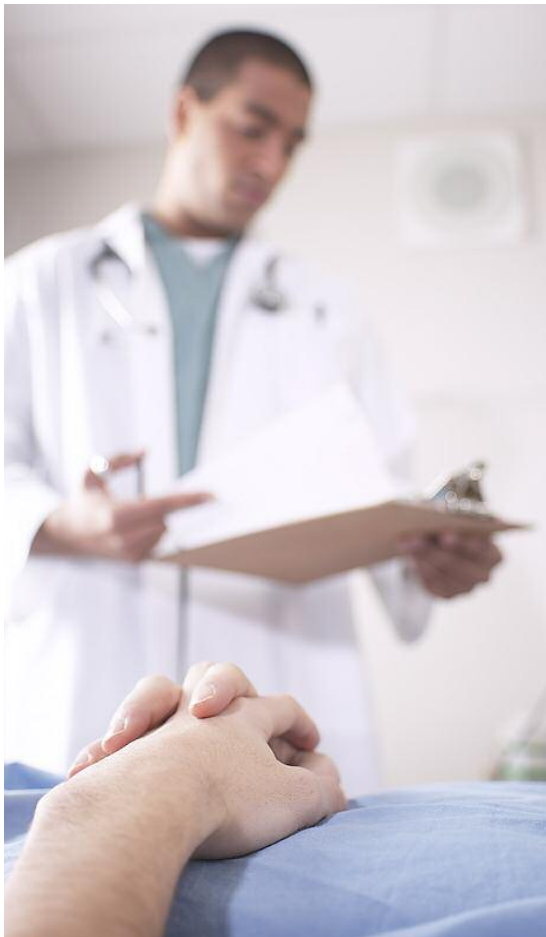


The Mini Exam with Maximal Staying Power

The most-cited paper in neuropsychiatry grew out of a husband/wife exchange.



AS A THIRD-YEAR resident in the fall of 1973, Susan Folstein made daily rounds of the geriatric ward at Cornell Medical Center's Westchester Hospital. Husband Marshal Folstein was the ward's attending psychiatrist. Like the other residents, Susan was supposed to assess the mental state of each patient and identify any cognitive impairment. As Marshal remembers it, she'd report, "Mrs. Jones is doing better today, or she's doing worse." And he would always reply, "But how do you know she's better?"

Hopkins' legendary psychiatrist Paul McHugh, now retired, was then the residency training director at Cornell. "Because Susan was married to Marshal," McHugh jokes, "she could only put up with this for so long." One day, exasperated, she finally said, "Why don't you just write down all of the questions you want me to ask these people?"

So that night, Folstein did. He knew from his previous neurology training the kinds of questions to ask: simple, direct, objective. What day is it? Spell world backwards. Repeat the following. They targeted cognitive function only, rather than moods or perceptions. He called his final product—a 30-point scale based on just 11 questions—the Mini Mental State Examination (MMSE). The test could be given in just 10 minutes.

Susan Folstein immediately began using the MMSE with her patients, and soon the

pair set up a trial to see if the exam could differentiate among patients with various cognitive disorders. It could. The MMSE scores of the 206 patients in the trial reliably predicted whether they had dementia, depression or normal cognitive functioning (roughly any score above 24).

"We were just kids; we didn't have any training. We just needed it to do our work everyday," recalls Marshal. But the test was revolutionary. "And once we had it," McHugh says, "it became obvious that nobody else had anything else like it."

With McHugh's help, the pair submitted their results to the *Journal of Psychiatric Research*. The paper was published in 1975, about the time that all three authors moved to Johns Hopkins. It's since been cited in the scientific literature more than 19,000 times—making it the most-cited paper in neuropsychiatry.

Marshal Folstein attributes some of its popularity to an 18,000-patient epidemiological survey of mental health conducted by Hopkins and four other large medical centers in the early 1980s. The survey's designers used the MMSE as one of the screening tests, thus validating its effectiveness to the entire field. "And for whatever reason, it has since become the standard test for pretty much any drug study that involves Alzheimer's or dementia," says Marshal Folstein, who, with Susan, now serves on the faculty in the Department of Psychiatry and Behavioral Services at Hopkins.

"Every psychiatrist in training knows what a Mini Mental score of 24 means," McHugh says. "They know 24 like we all know 98.6." *Virginia Hughes*