People with multiple physical conditions have faster brain decline, higher suicide risk

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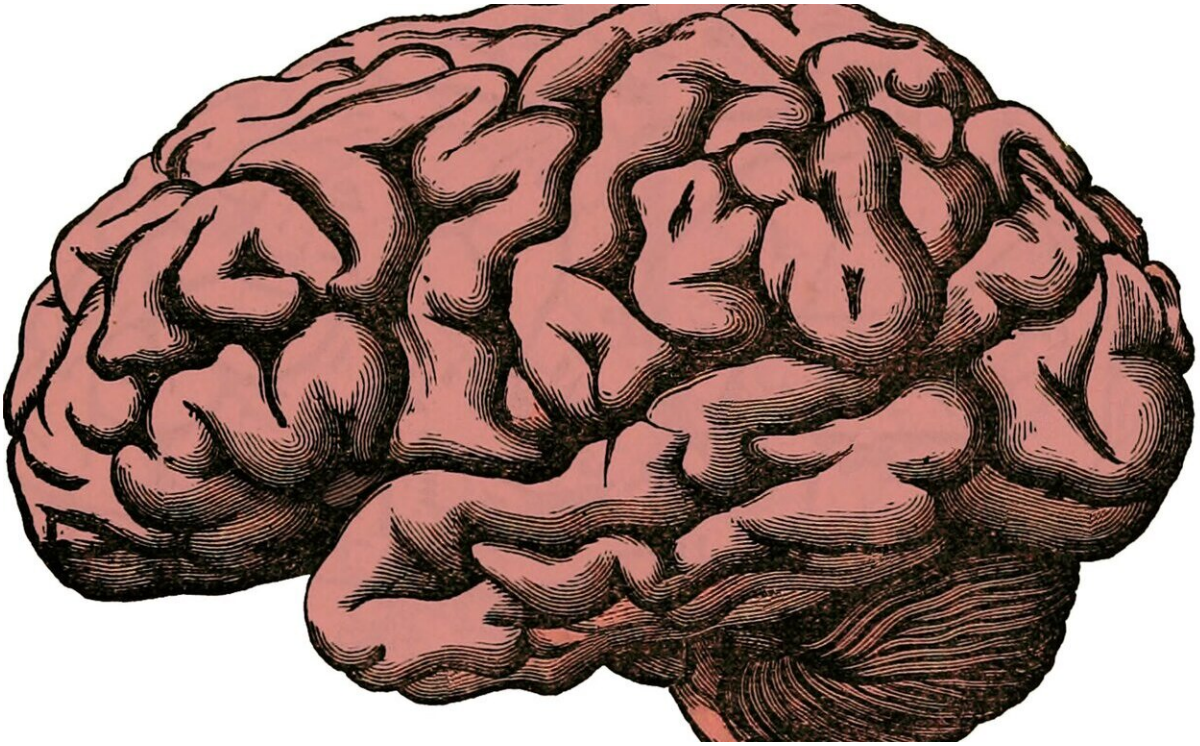

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Having arthritis, or diabetes, or heart disease can change a person's life, getting in the way of daily activities and requiring special diets and medicines.

But what happens when new conditions get stacked on top of that first

one, creating a burden of multiple diseases that need daily managing?

As millions of Americans cope with just such a combination of conditions, a new approach to measuring what their lives are actually like has emerged.

Multimorbidity scores can help doctors understand their patients' overall prognosis—and can help researchers identify special risks faced by people with multiple chronic illnesses.

In fact, new research by a University of Michigan team shows that people with higher multimorbidity scores had a much faster decline in their thinking and memory abilities than those with lower scores.

Even though most of the chronic conditions included in the index have no direct relationship to brain health, the higher a person's score, the faster they declined over a 14-year period in their ability to recall words and do simple math.

The results, published online in the *Journals of Gerontology: Series A*, used data from more than 14,260 people studied multiple times over a decade or more through the Health and Retirement Study based at U-M.

Meanwhile, just months ago, the same index revealed that people with higher scores were more than twice as likely to die by suicide than those with lower scores, and that they had worse mental health-related quality of life in general.

Those findings, made by calculating the multimorbidity index for participants in three long-term studies of more than 250,000 health professionals including dentists, podiatrists, chiropractors and nurses, were published in the *Journal of the American Geriatrics Society*. They show the mental and physical burden of living with multiple diseases.

U-M researcher and Michigan Medicine primary care physician Melissa Wei, M.D., M.P.H., M.S., has spearheaded the development of the scoring system, called the multimorbidity weighted index or MWI.

Assessing the total impact of a person's health conditions is important because 80% of adults over the age of 65 have more than one condition, and 45% of all adults have more than one, says Wei.

Careful tool development

Over the course of years, she compiled and tested a way to assess what life is like for people with multiple chronic conditions, from glaucoma and heart arrhythmias to multiple sclerosis and a history of knee, hip and spinal disc problems.

But it's not as simple as counting the number of diseases and conditions a person has gotten diagnosed with, the researchers caution.

Rather, the risk of cognitive decline, suicide or poor mental well-being has to do with the total impact that their unique combination of conditions has on their quality of life.

Because different conditions affect people in different ways, the scoring system takes into account how that happens—and how those effects might interact with one another.

Early this year, Wei and colleagues published a study showing that the risk of dying rose 8% for every single-point rise in MWI score, and that the rise in score tracked closely with the decrease in physical abilities of people with multiple conditions.

That study, also in *Journals of Gerontology: Series A*, also used Health and Retirement Study data, from 18,174 people over the age of 51 who

took part in the study over 11 years.

How to calculate a multimorbidity score

While the MWI scoring approach has been useful in research, Wei and her colleagues now hope that clinicians can use it to help them understand the needs and manage the care of patients with multiple conditions.

A free MWI scoring tool is now available for clinician use at the website ePrognosis, run by the University of California, San Francisco.

Any clinician can enter a few pieces of anonymous information about a patient over age 54 into the calculator and come up with a score for them. The results page also gives a breakdown of how likely people like that study participant are to die within the next 10 years, or to experience a decline in their physical functioning in the next four to eight years.

While Wei cautions clinicians not to use the score as the sole indicator of any one patient's prognosis, she hopes that the score can help guide discussions about a range of decisions from preventive care to elective surgery to living arrangements and end-of-life care preferences.

Using multimorbidity research

The research that Wei and colleagues have done on the impacts of high MWI scores across groups of patients could also help guide care.

For instance, the finding that suicide risk rose sharply as MWI score rose could help clinicians think about which patients might be most in need of depression and suicide screening. As patients develop more conditions with age, physicians may want to monitor their mental health more

closely, and offer appropriate lifestyle advice and treatment.

"As clinicians, we are more likely to assess suicide risk in people with known depression or other mental health or substance use issues, but we may not automatically consider that those with more 'physical' conditions only could also be at higher risk," says Wei. "Multimorbidity has several downstream consequences. Physical impairments are just the beginning. As conditions accumulate and physical functioning deteriorates, we have found this is closely linked to worse mental health, social health, and eventually premature mortality."

In short, she says, "The association between the MWI score with suicide risk and overall mental well-being warrants attention."

Having a high MWI score, she says, makes someone functionally older than their "calendar" or chronologic age would suggest. Clinicians can use the score to help them think about the "biologic age" of the patient before them based on the life span expectations for people with similar scores.

Using scores clinically could also help providers ensure that patients with high scores receive care management services, or other support to help them live their best life and keep on top of the tests, treatments and lifestyle changes that can help them do so.

"We want patients to have good insight into how the conditions they've developed over the years are affecting their well-being, and be open to communicating with their care teams about how those conditions affect their functioning, quality of life and overall health now and in the future," says Wei. "We also know that social support, and having a strong purpose in life, can protect against some of the detrimental effects of multiple conditions. We need to help patients understand these connections, foster their development early on, and sustain them through

each stage of life and changes in health."

Wei's research and the development of the MWI tool are funded by the National Institute on Aging, National Institutes of Health, as are the large studies that provided the data used to validate the tool and discover the impacts of high MWI scores.

More information: Melissa Y Wei et al, Multimorbidity and Cognitive Decline Over 14 Years in Older Americans, *The Journals of Gerontology: Series A* (2019). DOI: 10.1093/gerona/glz147

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