

Older adults who can really smell the roses may face lower likelihood of dementia

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By *Suzanne Leigh* [1]



Seniors who can identify smells like roses, turpentine, paint-thinner and lemons, and have retained their senses of hearing, vision and touch, may have half the risk of developing dementia as their peers with marked sensory decline.

In a study by UC San Francisco, researchers tracked close to 1,800 participants in their 70s for a period of up to 10 years to see if their sensory functioning correlated with the development of dementia. At the time of enrollment, all participants were dementia-free, but 328 participants (18 percent) developed the condition over the course of the study.

Among those whose sensory levels ranked in the middle range, 141 of the 328 (19 percent)

developed dementia. This compares with 83 in the good range (12 percent) and 104 (27 percent) in the poor range, according to the study, published in *Alzheimer's and Dementia: The Journal of the Alzheimer's Association* [2] on July 20, 2020.

Vision, hearing, touch, olfaction linked to cognition, UCSF study shows



Kristine Yaffe, MD [3]



Willa Brenowitz, PhD, MPH [4]

Previous research has centered on the link between dementia and individual senses, but the UCSF researchers' focus was on the additive effects of multiple impairments in sensory function, which emerging evidence shows are a stronger indicator of declining cognition.

“Sensory impairments could be due to underlying neurodegeneration or the same disease processes as those affecting cognition, such as stroke,” said first author Willa Brenowitz, PhD, MPH [4], of the UCSF Department of Psychiatry and Behavioral Sciences, and the Weill Institute for Neurosciences [5]. “Alternatively, sensory impairments, particularly hearing and vision, may accelerate cognitive decline, either directly impacting cognition or indirectly by increasing social isolation, poor mobility and adverse mental health.”

While multiple impairments were key to the researchers work, the authors acknowledged that a keen sense of smell, or olfaction, has a stronger association against dementia than touch, hearing or vision. Participants whose smell declined by 10 percent had a 19 percent higher

chance of dementia, versus a 1-to-3-percent increased risk for corresponding declines in vision, hearing and touch.

“The olfactory bulb, which is critical for smell, is affected fairly early on in the course of the disease,” said Brenowitz. “It’s thought that smell may be a preclinical indicator of dementia, while hearing and vision may have more of a role in promoting dementia.”

The 1,794 participants were recruited from a random sample of Medicare-eligible adults in the Health, Aging and Body Composition study. Cognitive testing was done at the beginning of the study and repeated every other year. Dementia was defined by testing that showed a significant drop from baseline scores, documented use of a dementia medication or hospitalization for dementia as a primary or secondary diagnosis.

Multisensory testing was done in the third-to-fifth year and included hearing (hearing aids were not allowed), contrast-sensitivity tests for vision (glasses were permitted), touch testing in which vibrations were measured in the big toe, and smell, involving identifying distinctive odors like paint-thinner, roses, lemons, onions and turpentine.

The researchers found that participants who remained dementia-free generally had higher cognition at enrollment and tended to have no sensory impairments. Those in the middle range tended to have multiple mild impairments or a single moderate-to-severe impairment. Participants at higher risk had multiple moderate-to-severe impairments.

“We found that with deteriorating multisensory functioning, the risk of cognitive decline increased in a dose-response manner,” said senior author Kristine Yaffe, MD [6], of the UCSF departments of Psychiatry and Behavioral Sciences, Epidemiology and Biostatistics, and Neurology, as well as the San Francisco VA Health Care System [7]. “Even mild or moderate sensory impairments across multiple domains were associated with an increased risk of dementia, indicating that people with poor multisensory function are a high-risk population that could be targeted prior to dementia onset for intervention.”

The 780 participants with good multisensory function were more likely to be healthier than the 499 participants with poor multisensory function, suggesting that some lifestyle habits may play a role in reducing risks for dementia. The former group was more likely to have completed high school (85 percent versus 72.1 percent), had less diabetes (16.9 percent versus 27.9 percent) and were marginally less likely to have cardiovascular disease, high-blood pressure and stroke.

Co-author: Allison Kaup, PhD, of UCSF, San Francisco VA Health Care System and the Neurology Center of Southern California.

Funding: National Institutes of Health, National Institute on Aging and Alzheimer’s Association.

Read the paper

- ***Alzheimer’s and Dementia: The Journal of the Alzheimer’s Association:*** Incident dementia and faster rates of cognitive decline are associated with worse multisensory function summary scores [2]

Further coverage

- **Psychology Today:** Why Being Able to Smell the Roses Matters as We Age ^[8]
 - **Fox News:** Good sense of smell may indicate lower risk of dementia in older adults: study ^[9]
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About UCSF Psychiatry and Behavioral Sciences

The UCSF Department of Psychiatry and Behavioral Sciences ^[10] and the Langley Porter Psychiatric Institute are among the nation's foremost resources in the fields of child, adolescent, adult, and geriatric mental health. Together they constitute one of the largest departments in the UCSF School of Medicine and the UCSF Weill Institute for Neurosciences, with a mission focused on research (basic, translational, clinical), teaching, patient care, and public service.

UCSF Psychiatry and Behavioral Sciences conducts its clinical, educational, and research efforts at a variety of locations in Northern California, including Langley Porter Psychiatric Hospital and Clinics ^[11]; UCSF Medical Centers at Parnassus Heights, Mission Bay, and Mount Zion; UCSF Benioff Children's Hospitals in San Francisco ^[12] and Oakland ^[13]; Zuckerberg San Francisco General Hospital and Trauma Center; the San Francisco VA Health Care System; UCSF Fresno; and numerous community-based sites around the San Francisco Bay Area.

About the UCSF Weill Institute for Neurosciences

The UCSF Weill Institute for Neurosciences ^[14], established by the extraordinary generosity of Joan and Sanford I. "Sandy" Weill, brings together world-class researchers with top-ranked physicians to solve some of the most complex challenges in the human brain.

The UCSF Weill Institute leverages UCSF's unrivaled bench-to-bedside excellence in the neurosciences. It unites three UCSF departments—Neurology, Psychiatry, and Neurological Surgery—that are highly esteemed for both patient care and research, as well as the Neuroscience Graduate Program, a cross-disciplinary alliance of nearly 100 UCSF faculty members from 15 basic-science departments, as well as the UCSF Institute for Neurodegenerative Diseases, a multidisciplinary research center focused on finding effective treatments for Alzheimer's disease, frontotemporal dementia, Parkinson's disease, and other neurodegenerative disorders.

About UCSF

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