

## Adversity in childhood may lead to early aging for women

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Women who have experienced high levels of trauma in childhood, such as abuse by a parent, are biologically older at the epigenetic cellular level in adulthood than women of the same age who have not experienced such adversity, according to a new study by UC San Francisco.

Epigenetic "clocks" measure biological age, by examining methylation patterns at certain sites in the DNA of blood cells. An individual may be 40 years old and have cells that look more like those of someone who is 50 years old; conversely, a 40-year-old may have cells that look like those of someone 30 years old. Being epigenetically older than your chronological age, based on these measures, is associated with developing diseases, such as heart disease and cancer, at a younger age and with a shorter life span.

In the study, published Jan. 10 in *Developmental Psychobiology* [1], 183 premenopausal women completed blood draws so that their biological ages could be calculated using epigenetic clocks. All the women were non-smokers and had no major diseases. The women were asked about the number of traumatic events that they had experienced before the age of 12, which are called adverse childhood experiences (ACEs). They also reported the age at which they began menstruating.

The level of trauma the women had experienced in childhood was associated with the age of their epigenetic clocks. The study also found that it was specifically abuse in early life that resulted in older epigenetic aging in adulthood, whereas physical neglect did not show the same relationship. Other studies have similarly found that not all ACEs have similar effects? physical, sexual or emotional abuse may have more severe effects than neglect.

A secondary finding was that the earlier a woman had started menstruation during puberty, the older her epigenetic clock was. Early life adversity has been speculated to result in earlier puberty, but this particular study found no association between childhood trauma and age at menarche.

?Trauma in childhood appears to age immune cells at a more rapid pace,? said lead author Elissa J. Hamlat, PhD [2], a postdoctoral scholar at the UCSF Department of Psychiatry and Behavioral Sciences, and Center for Health and Community (CHC). ?This could be one reason why individuals who experience more adversity in early life are more likely to have serious mental and physical health problems as adults.?

The link between ACEs and health conditions, such as asthma, diabetes, heart disease, and Alzheimer?s, has made screening for ACEs [3] by primary care physicians a priority for the California Surgeon General Nadine Burke Harris, MD [4].

?Early-life adversity may lead to premature aging decades before chronic disease develops,? Hamlat, ?These were healthy young and middle-aged women, who had yet to develop significant health conditions.?

Targeting the mechanisms by which childhood circumstances increase risk for severe health problems in adulthood can lead to the earlier identification and treatment of those most likely to develop physical and mental illness.

Senior study author Elissa Epel, PhD [5], professor and vice chair for adult psychology in the Department of Psychiatry and Behavioral Sciences and CHC, warns that the current pandemic, due to the sharp increases in isolation, financial and parenting stress, and domestic violence, has increased exposure to traumatic stressors for children.

Intervention with children who have experienced early adversity may protect children from developing mental health problems later, and some studies show family-based prevention programs may buffer against accelerated epigenetic aging in children from risky environments.

?It is important to focus on prevention, most critically, but also intervention,? Epel said.

## Read the journal paper

- ***Developmental Psychobiology***: Early life adversity, pubertal timing, and epigenetic age acceleration in adulthood [1]

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## About UCSF Psychiatry and Behavioral Sciences

The UCSF Department of Psychiatry and Behavioral Sciences [6] and the Langlely 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 [7]; UCSF Medical Centers at Parnassus Heights, Mission Bay, and Mount Zion; UCSF Benioff Children's Hospitals in San Francisco [8] and Oakland [9]; 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 [10], 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

The University of California, San Francisco [11] (UCSF) is exclusively focused on the health sciences and is dedicated to promoting health worldwide through advanced biomedical research, graduate-level education in the life sciences and health professions, and excellence in patient care. UCSF Health [12], which serves as UCSF's primary academic medical center, includes top-ranked specialty hospitals [13] and other clinical programs, and has affiliations throughout the Bay Area.

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### Links

[1] <https://doi.org/10.1002/dev.22085>

[2] <https://profiles.ucsf.edu/elissa.hamlat>

[3] <http://www.acesaware.org/>

[4] <https://www.ucsf.edu/news/2020/02/416676/working-ucsf-california-surgeon-general-aims-cut-adverse->

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[5] <https://profiles.ucsf.edu/elissa.epel>

[6] <https://psychiatry.ucsf.edu/welcome-ucsf-psychiatry>

[7] <https://psychiatry.ucsf.edu/lpphc>

[8] <https://www.ucsfbenioffchildrens.org/>

[9] <https://www.childrenshospitaloakland.org/main/home.aspx>

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