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Prevention Forward
CWP Presentation
April 10th, 2021

Emotions/Stress, Inflammation and your Cardiovascular Health



Who read the CWP Program Newsletter Issue #6, Page 2?

Loneliness Is a Public Health Problem: Loneliness is not just a feeling; it is also a public health problem that has been linked to increased risk of mental health issues, heart disease and even death. With rates of loneliness on the rise in the USA and around the world, people are addressing this crisis using everything from companion robots to social networking sites and apps. A new study in JAMA Psychiatry suggests that a better solution may lie in a much older, more ubiquitous form of technology: phone calls! *Apple News, March 26, 2021*

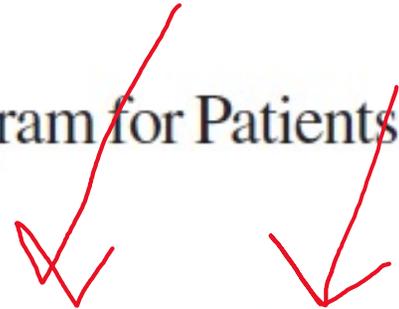


PreventionForward

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Cardiac Event Rate in a Lifestyle Modification Program for Patients with Chronic Coronary Artery Disease

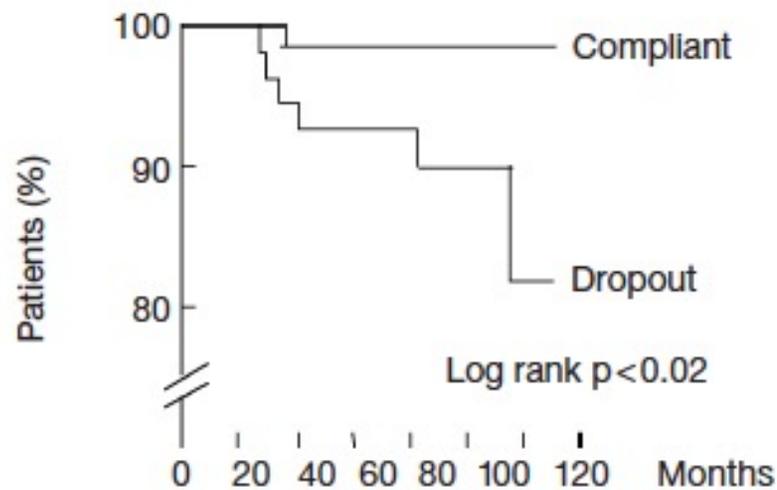


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Results

- In all, 134 patients enrolled in the program; of these, 77 completed the program and 57 failed to do so.
- Those who completed the program improved their effort tolerance and reached recommended goals for serum lipid and blood pressure levels.
- The cumulative event rate (cardiac death, myocardial infarction, and stroke) over 10 years in the patients who completed the program was 1.5%.
- The corresponding event rate in patients who dropped out was 18% ($p < 0.02$).



Patients at risk	0	24	48	72	96	120	Months
Compliant	77	77	61	50	31	11	
Non-compliant	57	57	43	32	17	7	

FIG. 1 Kaplan-Meier plot showing event-free survival in patients enrolled in the coronary heart disease lifestyle program. The events referred to are cardiovascular deaths, myocardial infarction, and stroke.



Relation between resting amygdalar activity and cardiovascular events: a longitudinal and cohort study

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Summary

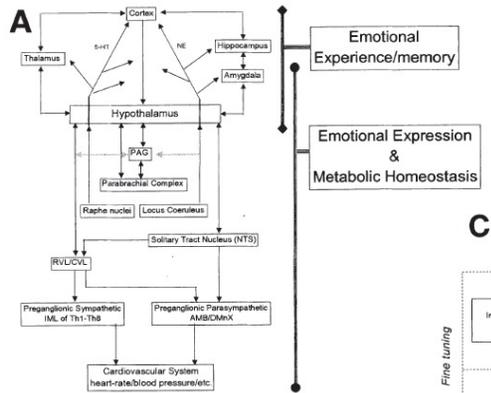
Background Emotional stress is associated with increased risk of cardiovascular disease. We imaged the amygdala, a brain region involved in stress, to determine whether its resting metabolic activity predicts risk of subsequent cardiovascular events.

Lancet 2017; 389: 834-45

Published Online

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Emotional Experience/memory

Emotional Expression & Metabolic Homeostasis

C

Fine Tuning

Emotions and Heart-Activity Control

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Fig. 1. Hypothetical model of limbic forebrain circuitry for emotions emerging from neuroimaging studies in mood disorders. Connections between highlighted structures illustrate the limbic system as originally defined by Papez (9).

I. Durães Campos et al.

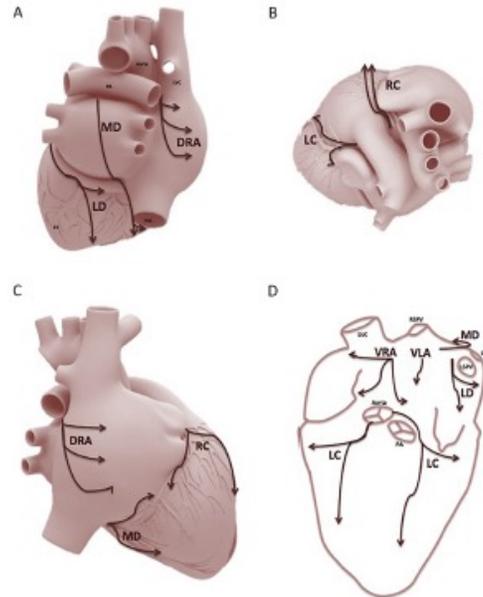


Fig. 3. Proposed scheme of innervation by the seven ganglionated subplexuses. A: Dorsal view. B: Right lateral view. C: Superior view. D: Ventral view. DRA: right dorsal atrial; VRA: ventral right atrial; LD: left dorsal; VLA: ventral left atrial; MD: middle dorsal; RC: right coronary; LC: left coronary.

Table 3. Disorders associated with chronic autonomic hyperactivity.

chronic autonomic hyperactivity-associated disorders
obesity
diabetes, insulin resistance
hypertension
insomnia and anxiety
hyperthermia
high energy expenditure
muscle wasting
increased susceptibility to infection
impairment of memory

Table 1. Manifestations of sympathetic and parasympathetic hyperactivity.

sympathetic hyperactivity	parasympathetic hyperactivity
hypertension	hypotension
tachycardia	bradycardia
hyper- or hypothermia	lacrimation and sialorrhoea
hyperhidrosis	yawning
mydriasis	miosis

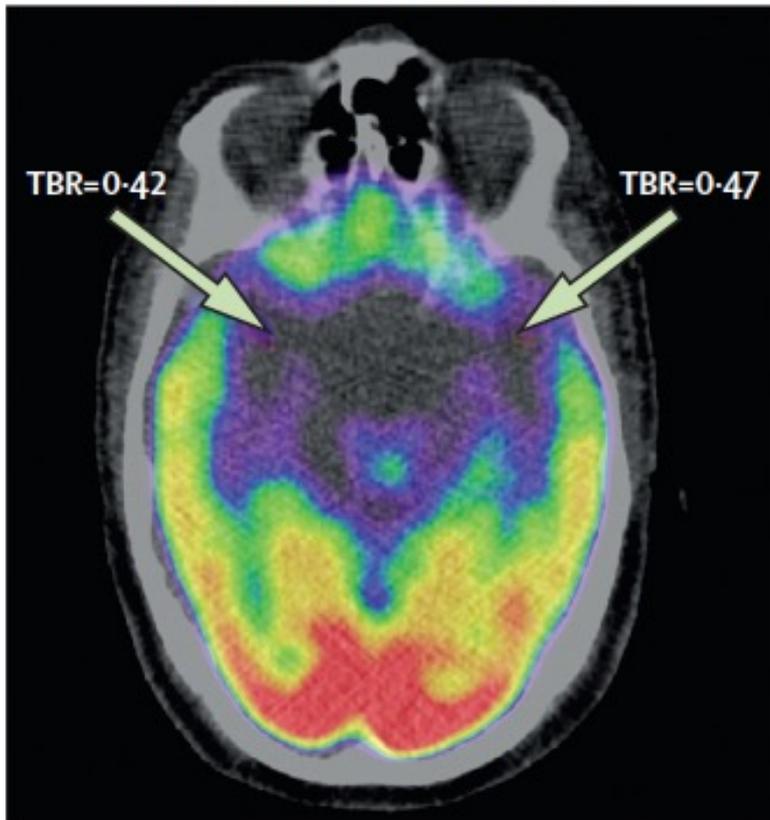
ORIGINAL INVESTIGATIONS

Stress-Associated Neurobiological Pathway Linking Socioeconomic Disparities to Cardiovascular Disease

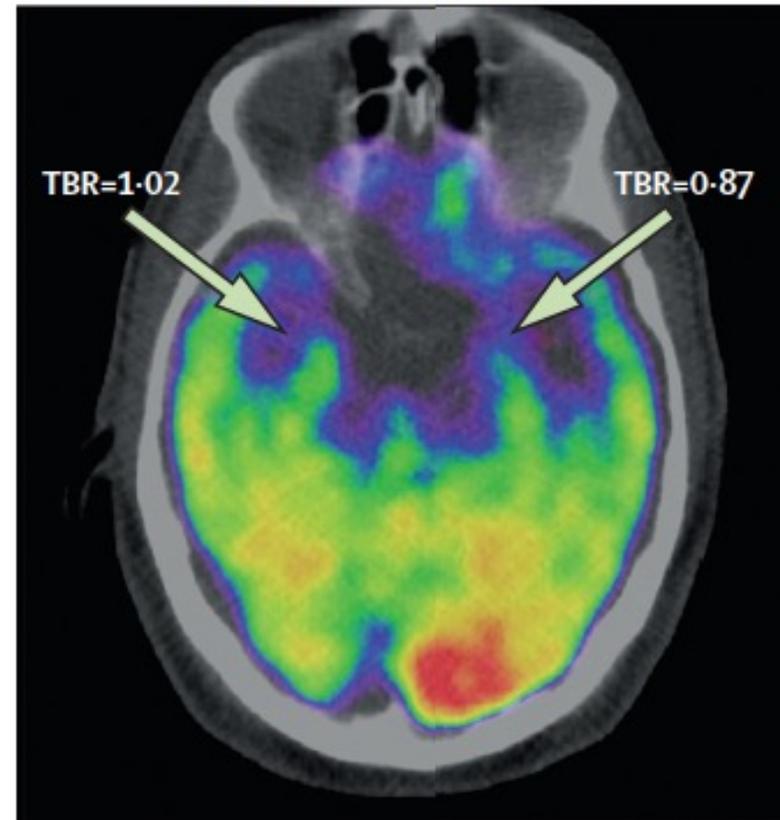


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Low amygdalar activity with no subsequent cardiovascular disease



High amygdalar activity with subsequent cardiovascular disease



Aorta

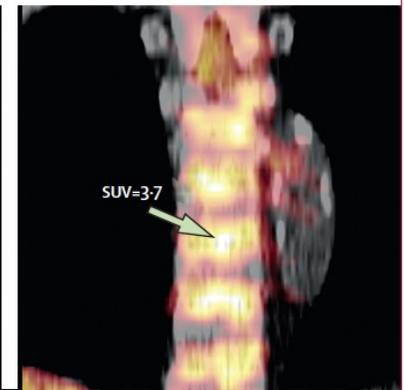
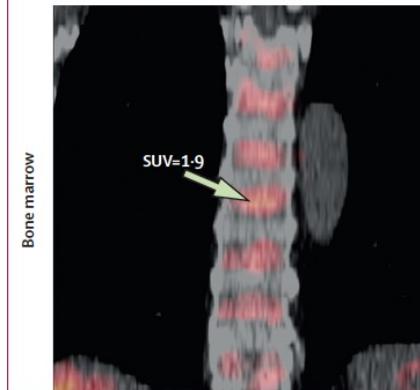
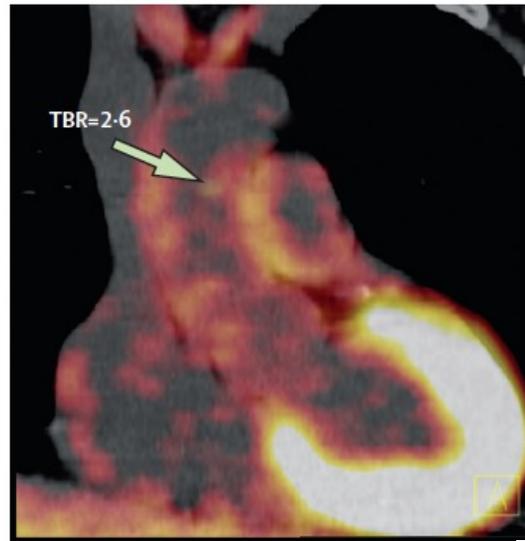
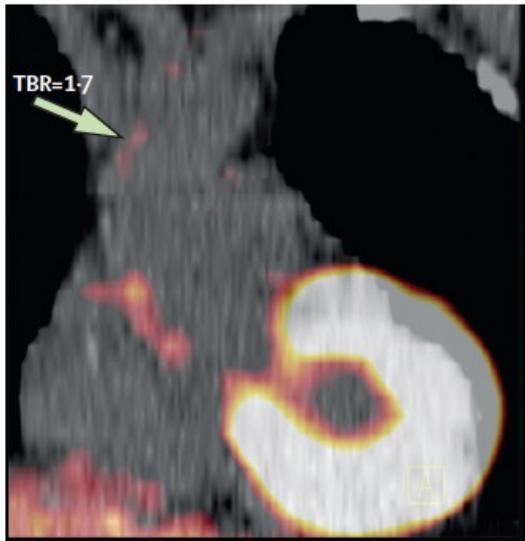
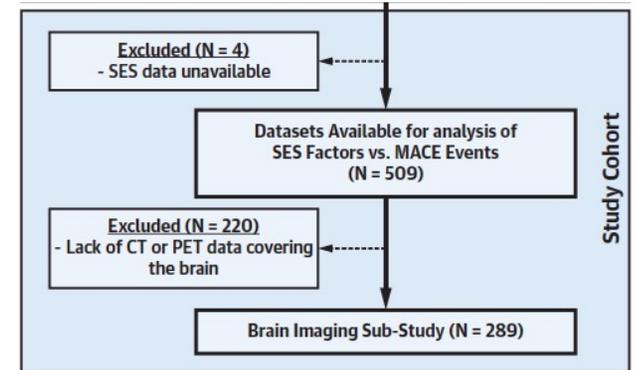
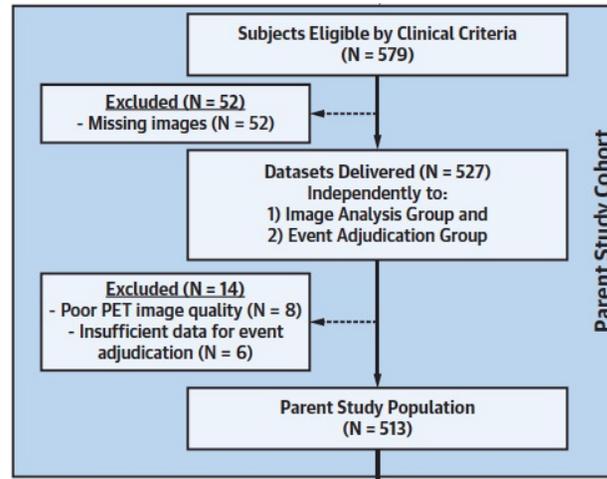
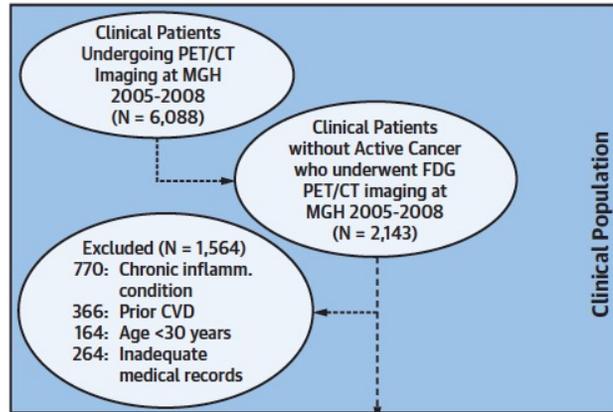


Figure 2: Amygdalar, arterial, and bone-marrow uptake of ^{18}F -FDG in individuals with and without subsequent cardiovascular disease events
Axial views of amygdala (upper left and right), coronal views of aorta (middle left and right), and coronal views of bone marrow (lower left and right) are shown. ^{18}F -FDG uptake was increased in the amygdala, bone marrow, and arterial wall (aorta), in a patient who experienced an ischaemic stroke during the follow-up period (right) compared with a patient who did not (left). ^{18}F -FDG= ^{18}F fluorodeoxyglucose. SUV=standardised uptake value. TBR=target-to-background ratio.

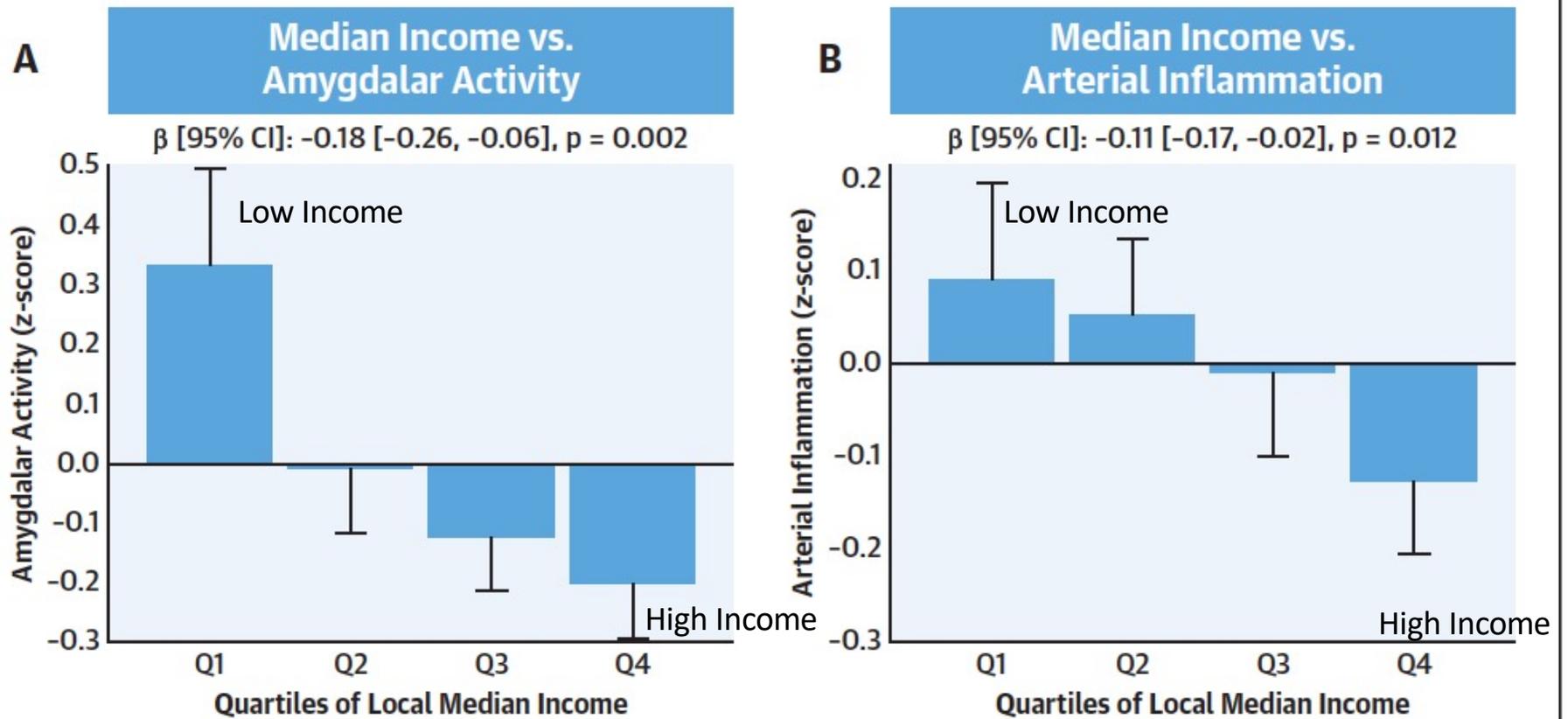
FIGURE 1 Study Cohort and Measurement of Tissue Activity

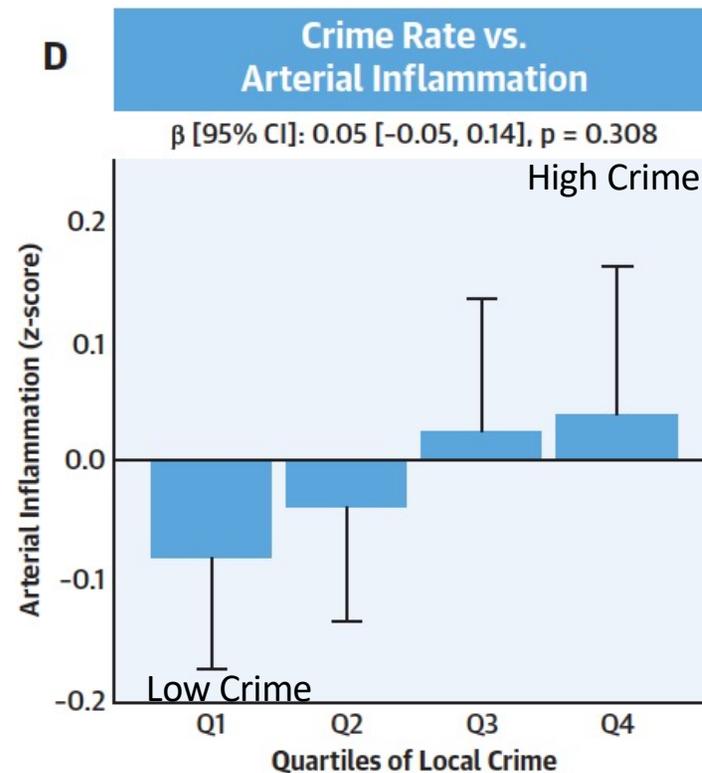
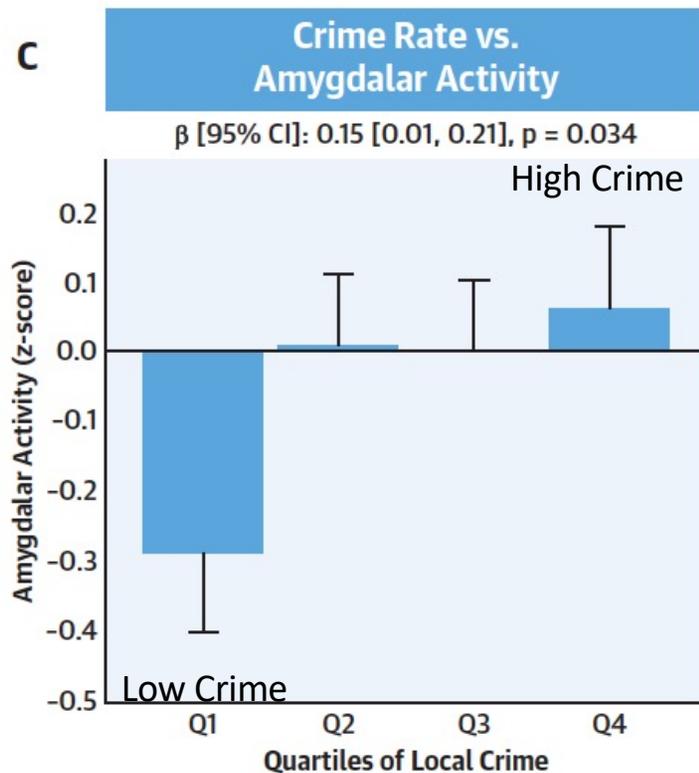
A



(A) Study cohort. The study cohort was derived from a database of patients who had undergone PET/CT imaging at General Hospital (MGH). All subjects meeting pre-defined criteria were included. Image analysis and event adjudication were performed by mutually blinded investigators. (B) Measurement of tissue activity. Amygdalar activity (in brain images) and arterial inflammation, respectively. Arrows indicate amygdalar activity (in brain images) and arterial inflammation, respectively. CVD = cardiovascular disease; FDG = fluorodeoxyglucose; MACE = major adverse cardiovascular events; SES = socioeconomic status.

FIGURE 2 Socioeconomic Status Versus Amygdalar Activity and Arterial Inflammation





Individuals were categorized according to quartiles of their neighborhood median income and neighborhood crime rates. Amygdalar activity (A) and arterial inflammation (B) were lower as neighborhood median income increased. Conversely, amygdalar activity was higher (C) and arterial inflammation trended toward an increase (D) as neighborhood crime rate increased. Amygdalar activity was adjusted for age and sex, and arterial inflammation was additionally adjusted for cardiovascular disease risk factors. **Error bars** indicate standard error of the mean. CI = confidence interval.

Low Crime

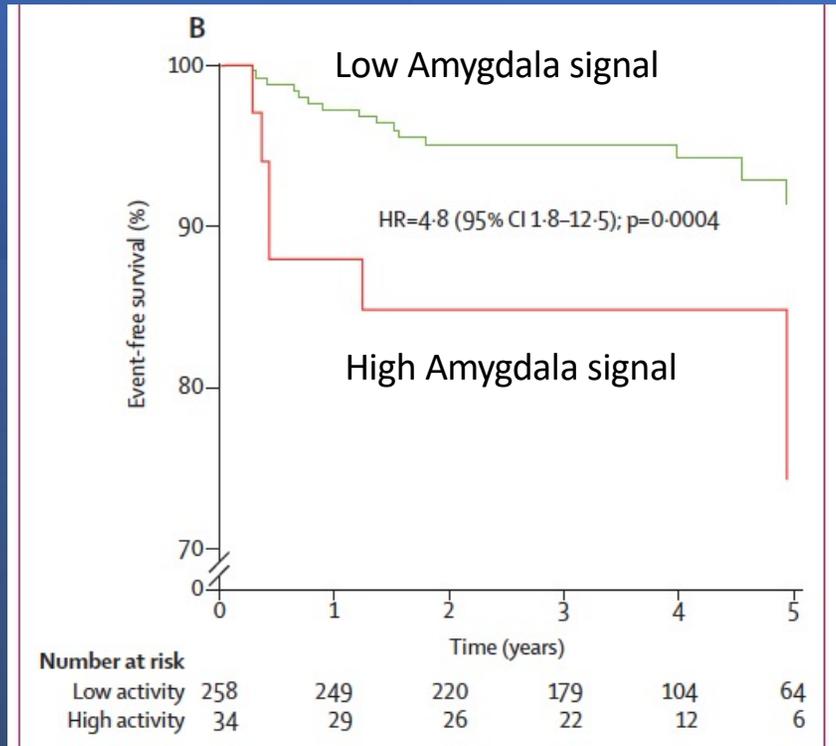


Figure 3: Kaplan-Meier survival curves of low vs high amygdalar activity based on the 90th percentile cutoff (A) or the mean (SD) cutoff (B)
Event-free survival for the primary amygdalar endpoint (max max amygdala_c—ie, the maximum standardised uptake value for the right and left amygdalae, corrected for background cerebral tissue activity) are shown. p values were calculated with the log-rank test, and cox regression analyses were done to calculate HRs. HR=hazard ratio.

Summary

- Fiery Amygdala, Arteries, and Bone Marrow are related
- Fiery Amygdala is related to high crime and low income
- Fiery Amygdala also correlates with worst cardiovascular outcomes

