

Neurobiology of Stress, Depression and PTSD and Applications to Mechanisms in Cardiovascular Disease



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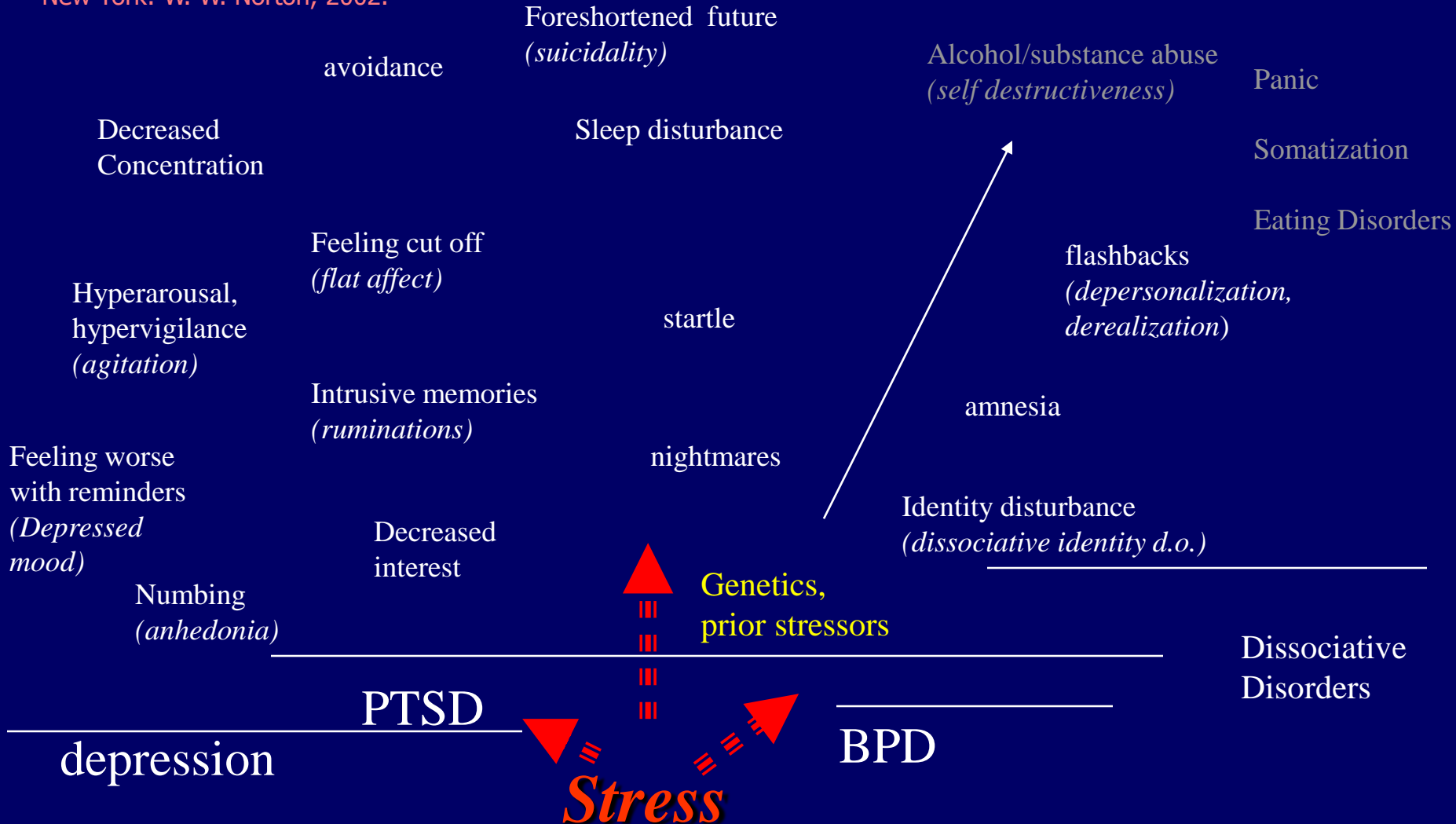
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Stress and Psychopathology

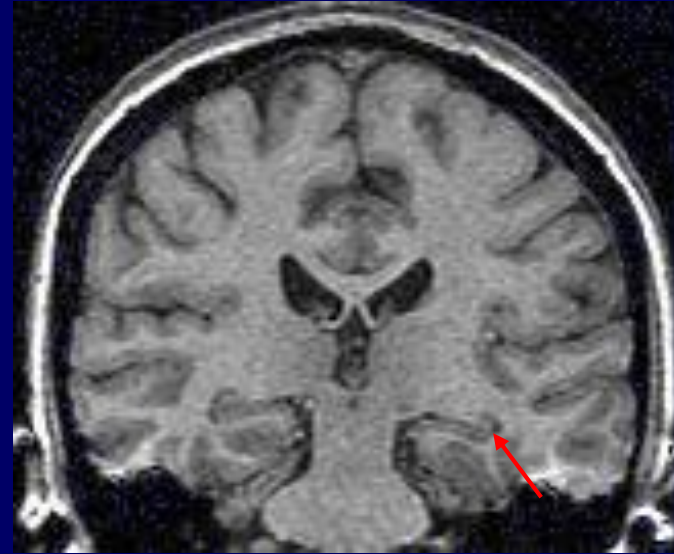
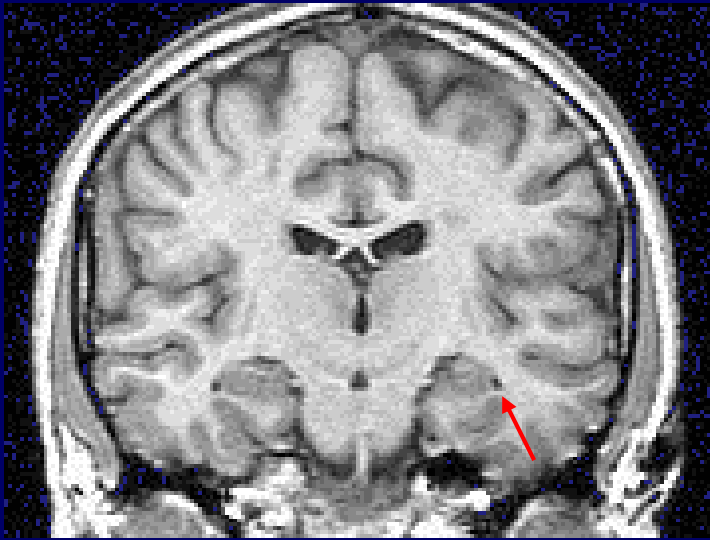
Stress may lead to a range of outcomes that do not have validity as discrete constructs

These trauma-related disorders have been termed *Trauma Spectrum Disorders*

From: Bremner JD: *Does Stress Damage the Brain? Understanding Trauma-related Disorders from a Mind-Body Perspective*. New York: W. W. Norton, 2002.



Hippocampal Volume Reduction in PTSD



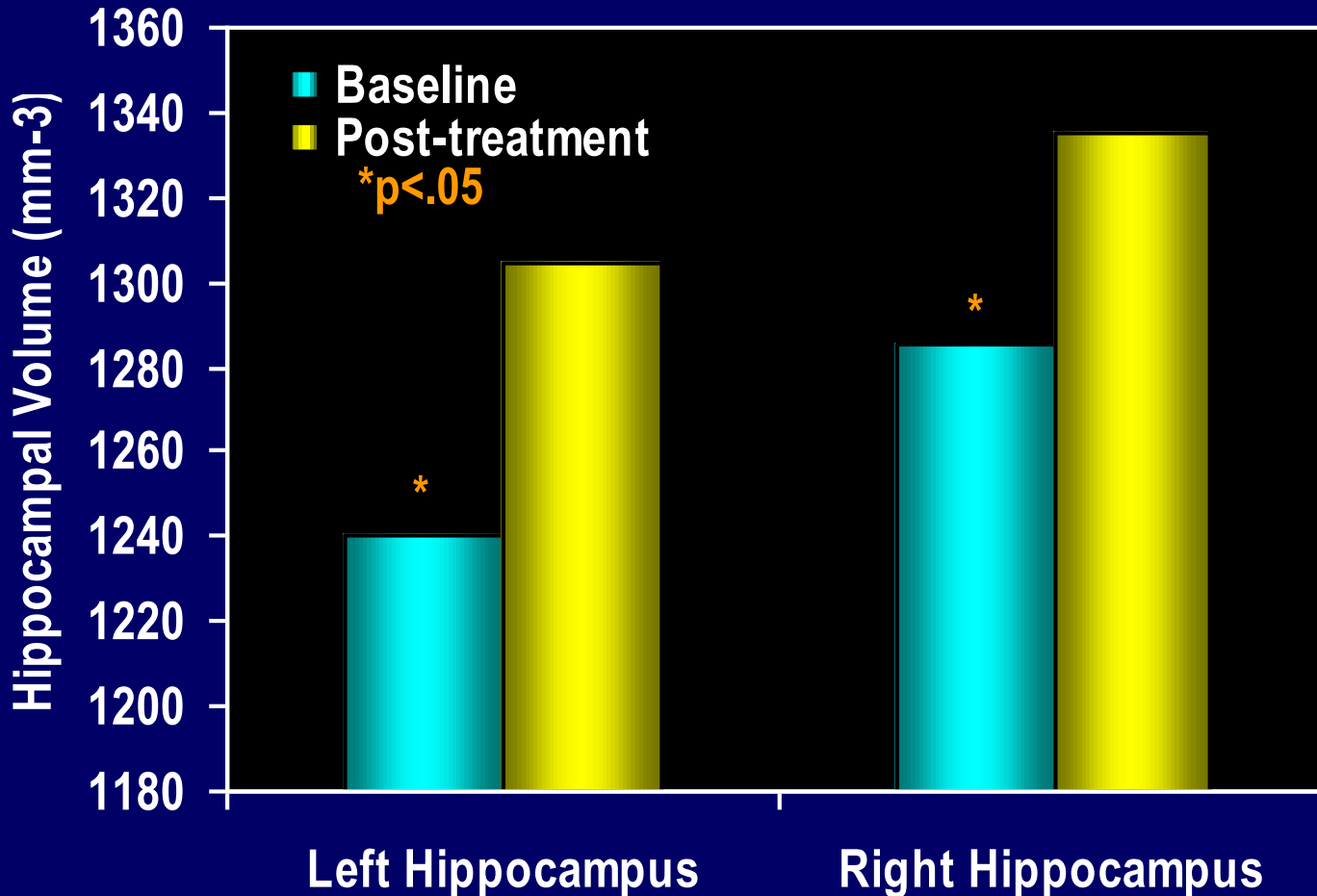
NORMAL



PTSD

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Increased Hippocampal Volume With Paxil in PTSD

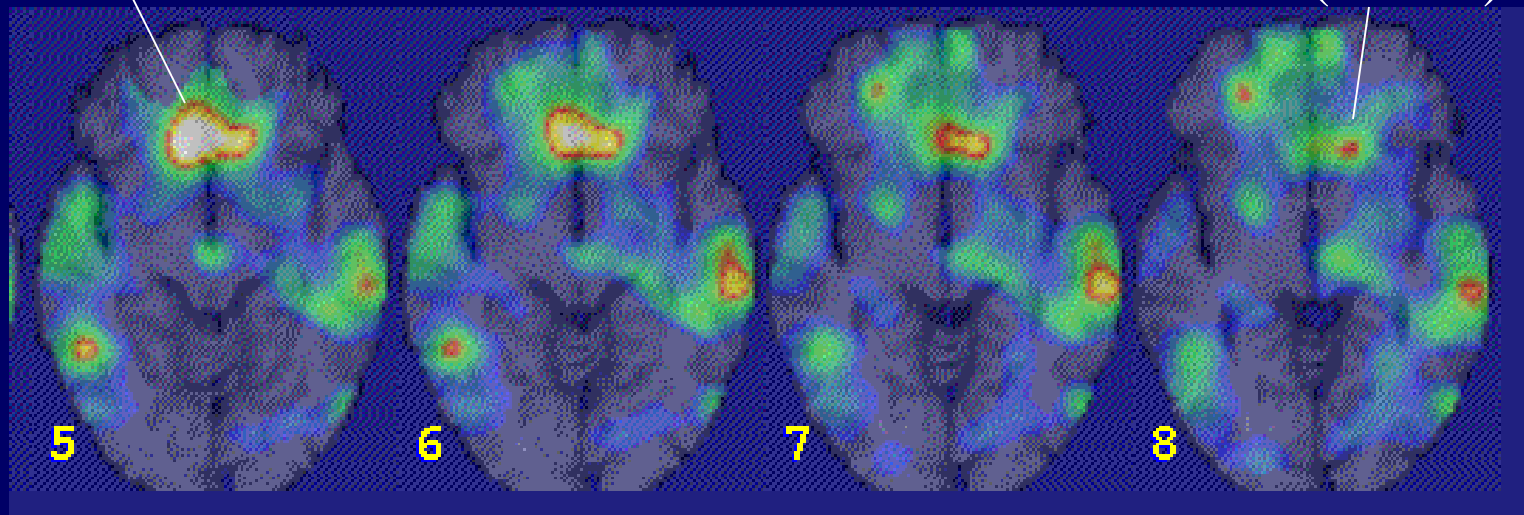


Effects of 9-12 months of treatment with 10-40 mg paroxetine.
Vermetten et al. *Biol Psychiatry*. 2003.

Medial Prefrontal Cortical Dysfunction with Traumatic Memories in PTSD

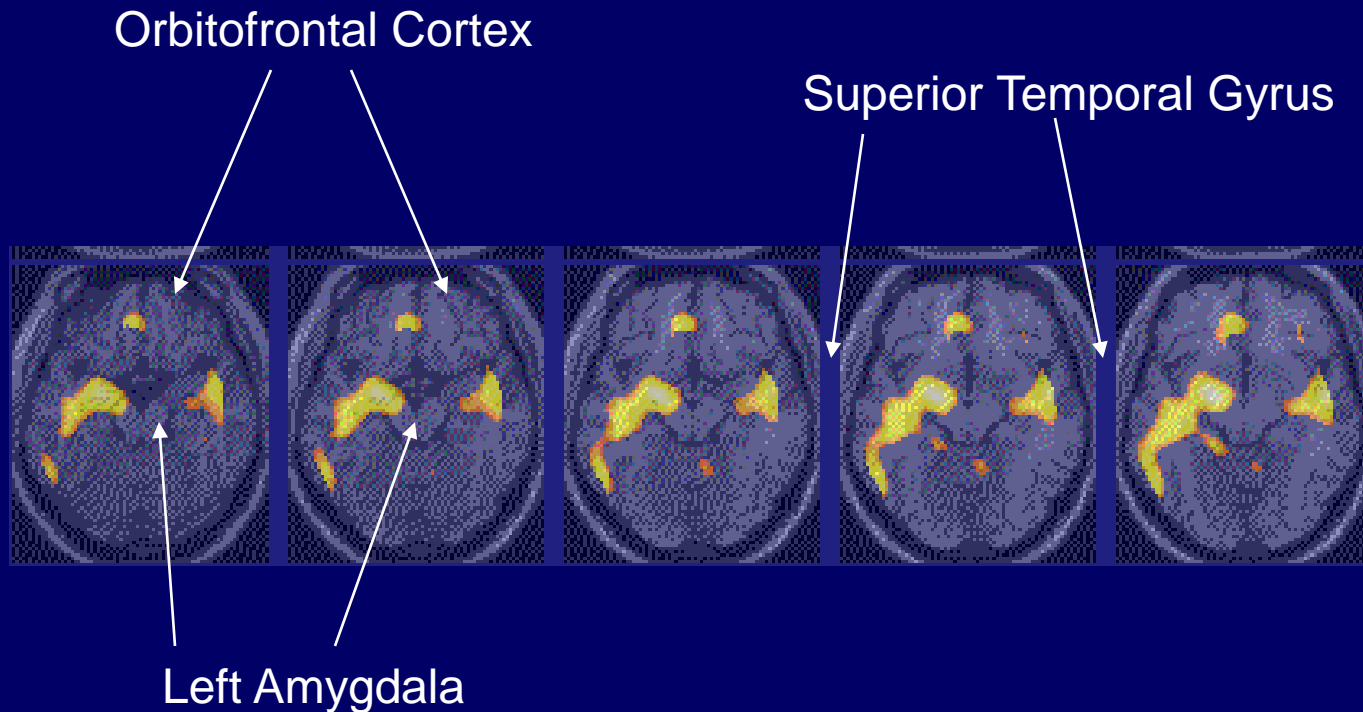
Medial PFC
(BA 25)

AC
(BA32)



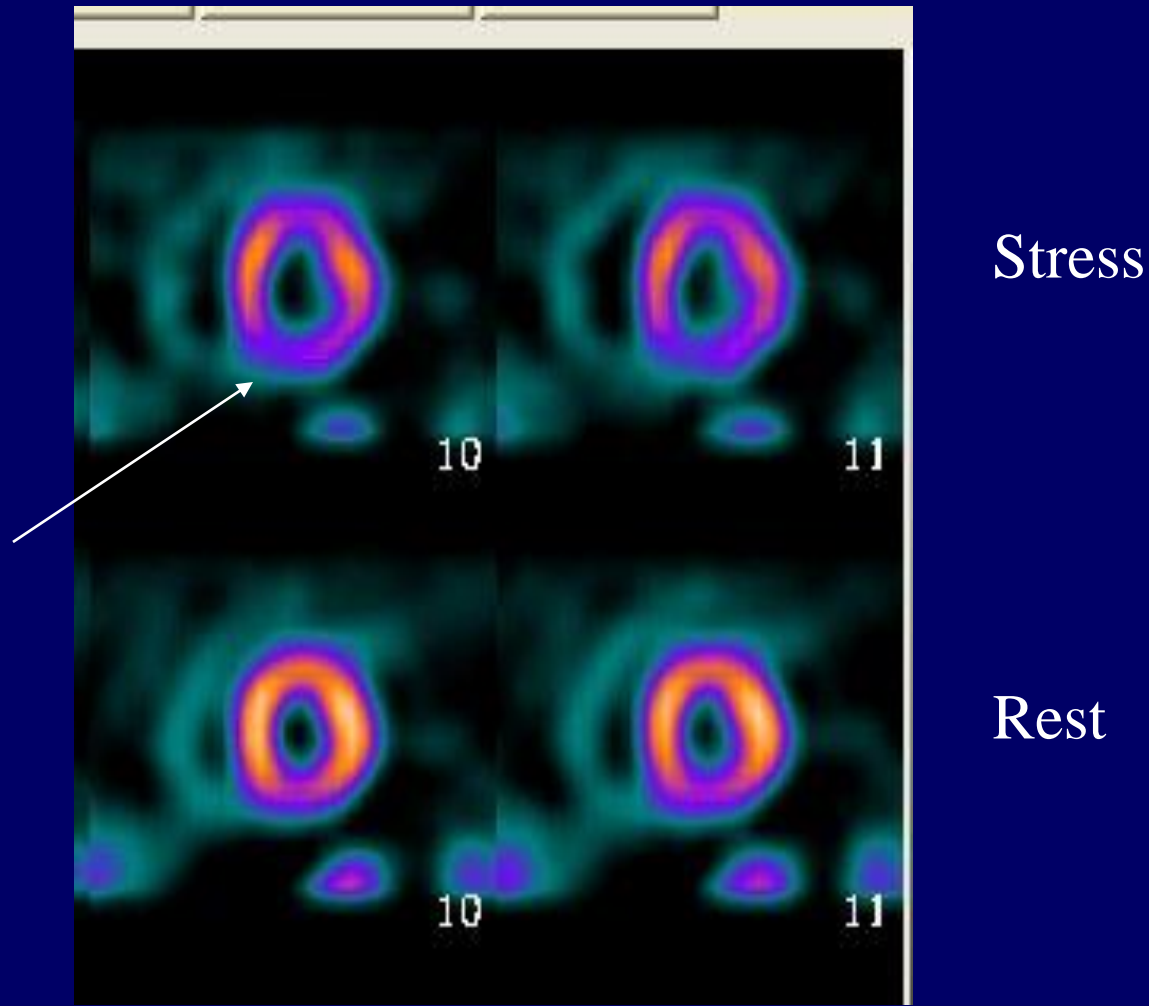
Decreased function in medial prefrontal cortical areas
Anterior Cingulate BA 25, BA 32 in veterans with PTSD compared to
Veterans without PTSD during viewing of combat-related slides & sounds
Z score >3.00; p<.001

Increased Blood Flow with Fear Acquisition versus Control in Abuse-related PTSD



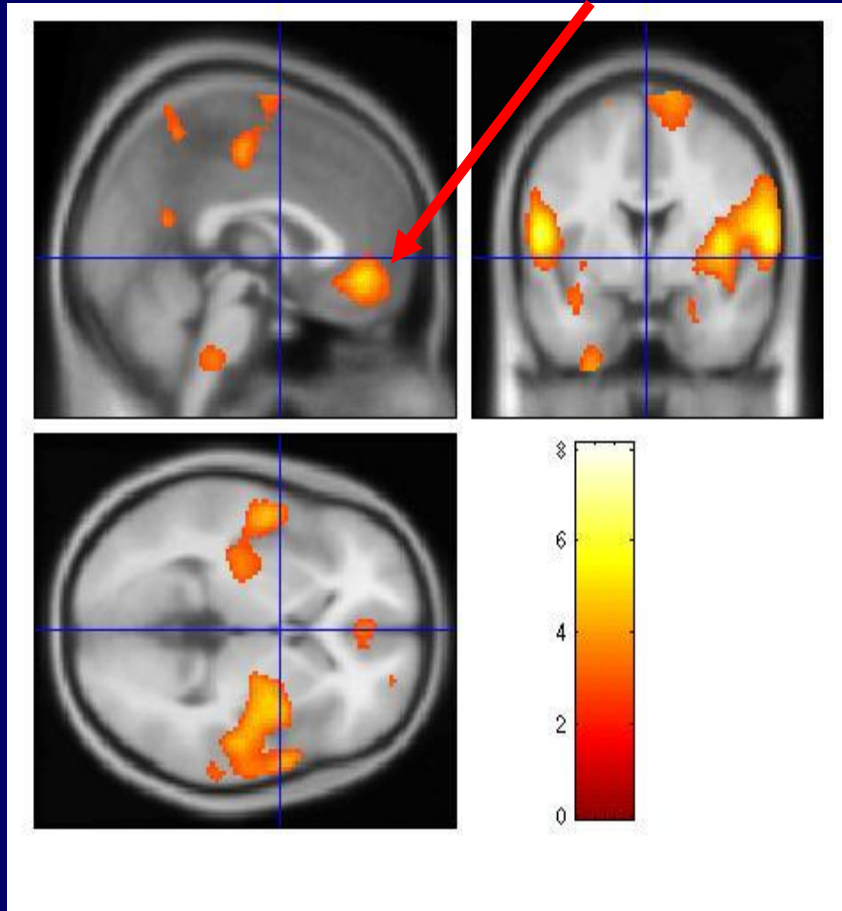
Yellow areas represent areas of relatively greater increase in blood flow with paired vs. unpaired US-CS in PTSD women alone, $z > 3.09$; $p < 0.001$

Stress Induced Ischemia in a Representative Subject with Depression and Trauma

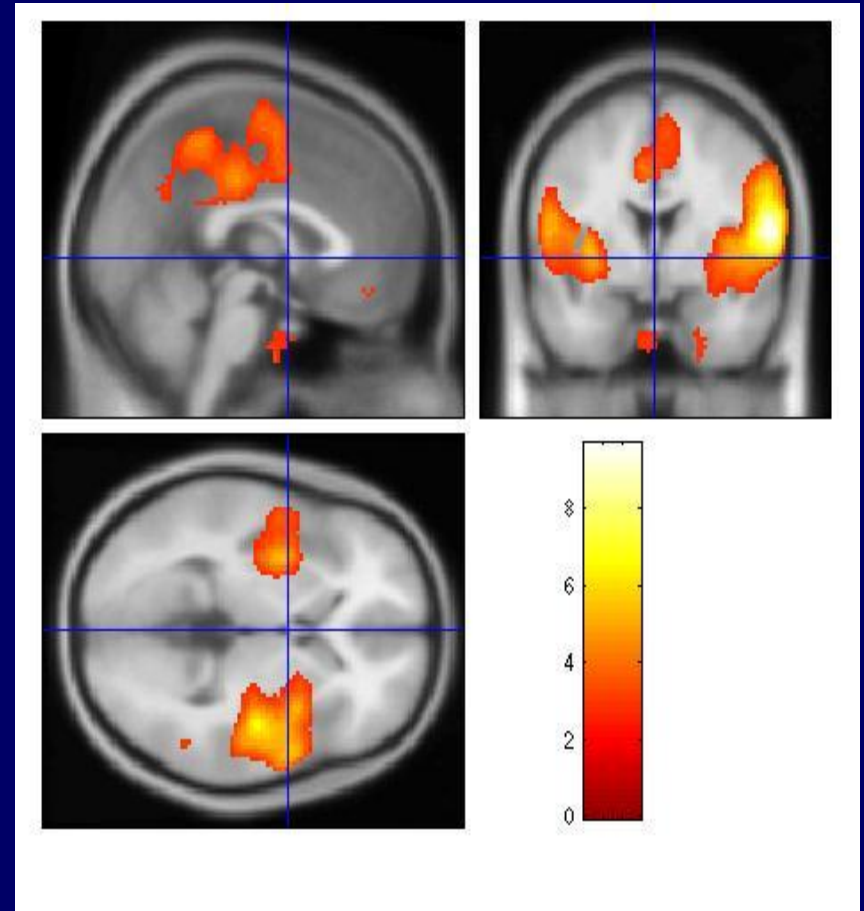


Decreased Anterior Cingulate Function with Stress in Depressed CHD Patients

Anterior Cingulate

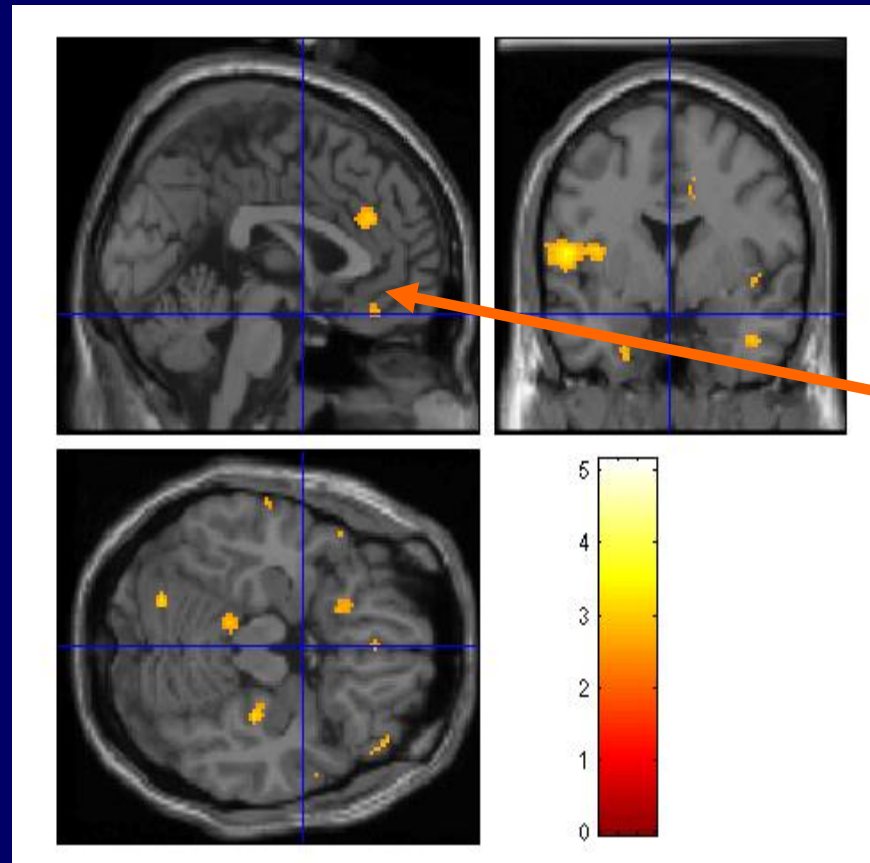


**CHD with
Depression**



**CHD without
Depression**

Decreased Anterior Cingulate Activation in Patients with CHD and Depression during Stress Induced Myocardial Ischemia



Anterior Cingulate

Decreased blood flow in anterior cingulate (arrow) in patients with CHD and depression during stress-induced myocardial ischemia (N=5) relative to patients with CHD and depression without stress-induced myocardial ischemia (N=8). There were also decreases in hippocampus.