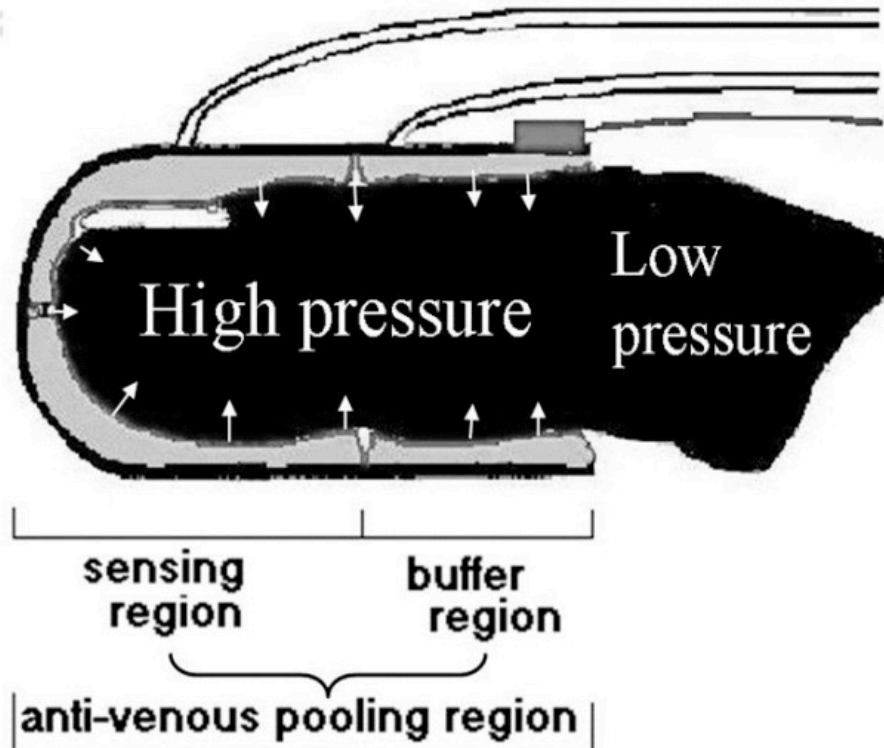


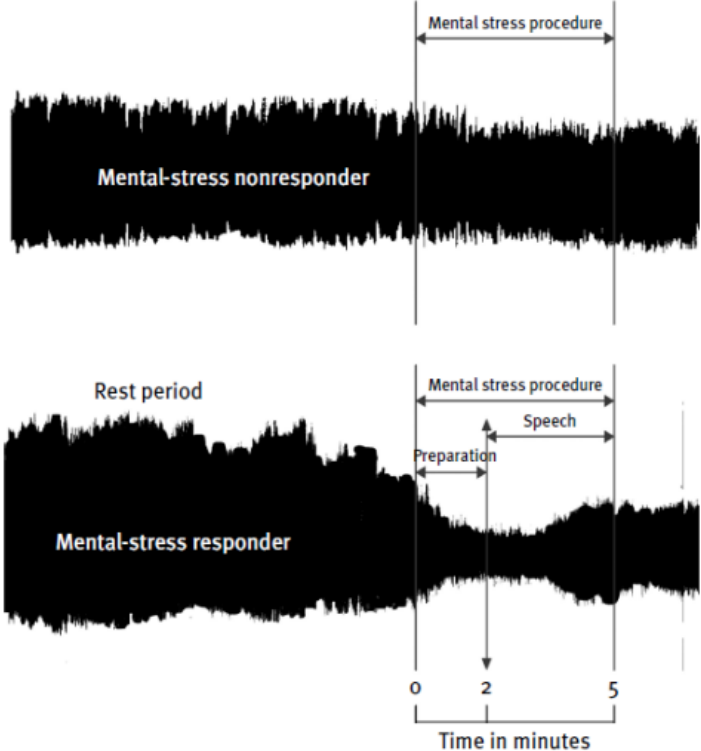
Supplementary Material

Neurobiological Pathways Linking Acute Mental Stress to Impairments in Executive Function in Individuals with Coronary Artery Disease

Supplementary Figure 1. Diagram of the PAT device. The PAT device uses a modified form of plethysmography to measure pulsatile blood volume changes. The probe applies a constant subdiastolic pressure over the distal two thirds of the finger to prevent distal venous blood stasis, unload arterial wall tension, and stabilize the probe to reduce noise. The device is also connected via thin tubing to an isolated volume reservoir to buffer within the probe itself. Pulsatile pressure changes from the probe are registered from a pressure transducer, and then fed into a specialized software which filters, amplifies, stores, and analyzes the signal in an operator-independent manner.



Supplementary Figure 2. Representative examples of PAT tracings. The top tracing shows the tracing of a patient with no response to mental stress. The bottom tracing shows significant peripheral arterial response to mental stress.



Supplementary Table 1. Baseline characteristic of the study population comparing the overall cohort and those with follow up cognitive assessments

	All Patients (N=389)	Patients with follow-up Cognitive tests (N=226)	p
Demographics			
Mean age, y (SD)	62 (9)	63 (8)	0.31
Male, N (%)	293 (75.3)	169 (74.8)	0.65
African-American, N (%)	121 (31.1)	70 (31.0)	0.88
Education, y (SD)	15 (3)	15 (4)	0.76
Medical History, N (%)			
Dyslipidemia	332 (85.3)	187 (82.7)	0.29
Current smoking	61 (15.7)	31 (13.8)	0.21
Obesity	318 (81.7)	182 (81.6)	0.69
Hypertension	312 (80.2)	172 (76.1)	0.31
Diabetes mellitus	128 (32.9)	63 (27.9)	0.12
History of heart failure	55 (14.1)	33 (14.6)	0.77
History of myocardial infarction	141 (36.2)	76 (33.6)	0.34
Physical stress-induced ischemia	133 (34.2)	78 (35.0)	0.78
Mental stress related variables			
sPAT, Mean (SD)	0.73 (0.32)	0.72 (0.38)	0.62
MS-induced ischemia, N (%)	64 (16.7)	34 (15.2)	0.45
Medications, N (%)			
Aspirin	328 (84.3)	198 (87.6)	0.36
Beta-Blocker	291 (74.8)	166 (73.5)	0.88
Statins	332 (85.6)	199 (88.1)	0.51
Angiotensin-converting enzyme inhibitors	187 (48.2)	108 (47.8)	0.87
Memory Function, mean (SD)			
Trail-A (s)	42 (20)	43 (18)	0.41
Trail-B (s)	101 (50)	99 (42)	0.39

Supplementary Table 2. Association between mental stress-induced inferior frontal lobe activation (Outcome) and executive function tests

	Trail-A	Trail-B
	B (95% CI)	
Inferior Frontal Lobe Activation		
Model 1	0.43 (0.05, 0.80)	0.54 (0.18, 0.91)
Model 2	0.26 (-0.13, 0.69)	0.47 (0.05, 0.88)

Bold indicates a p-value < 0.01

Model 1 unadjusted; Model 2 adjusted for demographics (age, sex, race, and education), clinical variables (body mass index, hyperlipidemia, diabetes mellitus, smoking history, prior myocardial infarction, and heart failure), baseline blood pressure levels, and medication use (aspirin, statin, angiotensin-converting enzyme inhibitor, and beta-blockers) and rate-pressure product during MS.