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Physiological Risk Factors for Developing PTSD

Risk Factor	**Test**	**Key Source**	**Notes**
Reduced extinction behavior	Fear extinction paradigms incorporating skin conductance and corrugator EMG responses	Guthrie, RM & Bryant, RA, 2006	Firefighters' reduced extinction of an aversively conditioned corrugator EMG response pre-trauma predicted 31% of the variance in PTSD severity.
Reduced hippocampal volume	MRI scanning and volumetric analysis	Gilbertson, MW et al. 2002	A monozygotic twin study demonstrated that smaller hippocampi constitute a risk factor for developing PTSD.
Higher amygdala activation	MRI	Admon, R et al. 2009	Heightened amygdala activity pre-trauma correlated to heightened stress responses to trauma but did not necessarily contribute to developing PTSD.
Hypocortisolism	Urinalysis	Yehuda, R et al. 2000	Children of Holocaust survivors have low levels of cortisol, suggesting that hypocortisolism might constitute a risk factor for the children of parents with PTSD. Offspring with both parental PTSD and lifetime PTSD had the lowest levels of cortisol of all study groups.
Low-expression variant of the 5-HTTLPR polymorphism of the serotonin transporter gene	Genome sequencing	Kilpatrick, DG et al. 2007	People with the low-expression variant of the gene developed PTSD at a higher rate than those lacking the low-expression variant.
Gender	Ask	Breslau, N et al. 1999	Even though males experience more traumatic events than females, they are about twice as likely to get PTSD.
Four single nucleotide polymorphisms of the FKBP5 gene	Genome sequencing	Binder et al. 2008	Four SNPs of the FKBP5 gene interacted with severity of childhood abuse as a predictor of adult PTSD symptoms.
Met/Met homozygotes for the Catechol-O-Methyltransferase $Val^{158}Met$ Polymorphism	Genome sequencing	Kolassa, I et al. 2010	Met/Met homozygotes (rather than Met/Val or Val/Val) exhibited a higher risk for PTSD independent of the severity of the traumatic load.
Enhanced metabolic activity in the dACC/MCC	PET and fluorodeoxyglucose 18 to examine resting regional cerebral metabolic rate for glucose (rCMRglu)	Shin, LM et al. 2009	Combat-exposed veterans and their non-combat exposed co-twins exhibited higher rCMRglu than veterans without PTSD and their co-twins.

Abnormal cavum septum pellucidum (CSP)	MRI	Pitman et al. 2006	Combat-exposed veterans with PTSD and non-combat-exposed co-twins exhibited abnormal CSPs.
Increased neurological soft signs (NSSs)	Clinical examination	Pitman et al. 2006	Combat-exposed veterans with PTSD and non-combat-exposed co-twins had higher average NSS scores than their non-PTSD counterparts.
LA allele for the serotonin transporter gene (SLC6A4)	Genome sequencing	Grabe, HJ 2009	The LA allele had an additive effect on one's risk of developing PTSD (0 alleles, least likely; 1 allele, more likely; or 2 alleles, most likely).
SNP of RGS2 (regulator of G-protein signaling 2)	Genome sequencing	Amstadter, AB 2009	This polymorphism was associated with increased PTSD symptoms following a hurricane.

Noteworthy findings:

Elevated heart rate at the time of presentation distinguished people who went on to develop PTSD from those who did not; however, no difference in heart rate existed during the one-month follow-up, suggesting that there is no difference in heart rate (pre- or post-trauma) between people who will develop PTSD and those who will not. Shalev et al. 1988.

Combat-exposed veterans with PTSD had larger heart rate responses (HRR) to a series of loud-tones compared to their non-veteran twins; however, the non-combat twins did not demonstrate larger HHR compared to control groups. Thus, the increased HRR (a.k.a. startle response) is an acquired sign of PTSD, not a pre-trauma risk factor. Pitman et al. 2006

Roger Pitman, Rachel Yehuda, and Scott Orr are three names that recur often in the literature.