

# What are the neural circuits activated by cognitive behavioral therapy?

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A new study published in the current issue of *Psychotherapy and Psychosomatics* provides new insights on how psychotherapy works. Cognitive behavioral therapy (CBT) is an effective treatment for panic disorder with agoraphobia (PD/AG). It is unknown, how variants of CBT differentially modulate brain networks involved in PD/AG. This study evaluated the effects of therapist-guided (T+) versus self-guided (T-) exposure on the neural correlates of fear conditioning in PD/AG.

In a randomized, controlled multicenter clinical trial in medication-free patients with PD/AG who were treated with 12 sessions of manualized CBT, functional magnetic resonance imaging (fMRI) was used during [fear conditioning](#) before (t1) and after CBT (t2). Quality-controlled fMRI data from 42 patients and 42 healthy subjects (HS) were obtained. Patients were randomized to two variants of CBT (T+, n = 22, and T-, n = 20). Results: The interaction of diagnosis (PD/AG, HS), treatment group (T+, T-), time point (t1, t2) and stimulus type (conditioned stimulus: yes, no) revealed activation in the left hippocampus and the occipitotemporal cortex. The T+ group demonstrated increased activation of the hippocampus at t2 (t2 > t1), which was positively correlated with treatment outcome, and a decreased connectivity between the left [inferior frontal gyrus](#) and the left hippocampus across time (t1 > t2).

After T+ exposure, contingency-encoding processes related to the posterior hippocampus are augmented and more decoupled from processes of the left inferior frontal gyrus, previously shown to be

dysfunctionally activated in PD/AG. Linking single procedural variants to neural substrates offers the potential to inform about the optimization of targeted psychotherapeutic interventions.

**More information:** Straube B, Lueken U, Jansen A, Konrad C, Gloster AT, Gerlach AL, Ströhle A, Wittmann A, Pfleiderer B, Gauggel S, Wittchen U, Arolt V, Kircher T. "Neural Correlates of Procedural Variants in Cognitive-Behavioral Therapy: A Randomized, Controlled Multicenter fMRI Study." *Psychother Psychosom* 2014;83:222-233

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