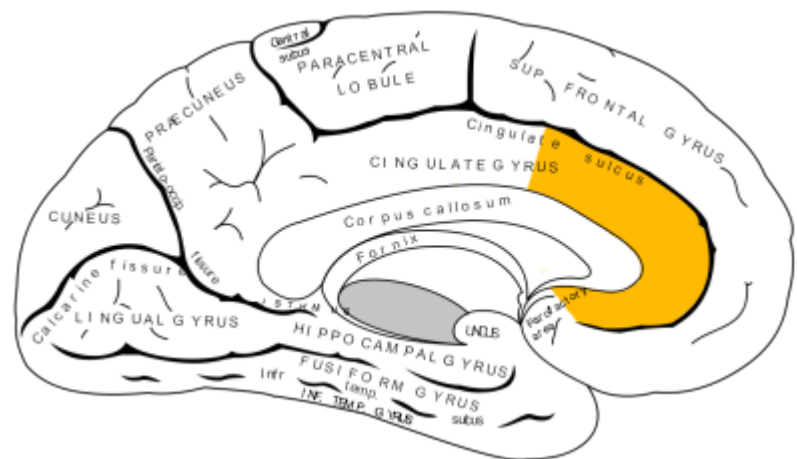


Anterior cingulate cortex functions



see also [dorsal anterior cingulate cortex](#).

The [anterior cingulate cortex](#), appears to play a role in a wide variety of [autonomic functions](#), such as regulating [blood pressure](#) and [heart rate](#).

It is also involved in rational [cognitive functions](#), such as [reward](#) anticipation, [decision-making](#), [empathy](#), [impulse control](#) and [emotion](#).

From January to December 2016, eighteen participants with [opiate](#) drug [addiction](#) during physical [detoxification](#) who completed a Drug Rehabilitation Center of Anhui Province, and eighteen healthy controls recruited performed a cue-elicited [craving](#) task in a MRI scanner while signal data were collected. Two regions of interest were the right anterior cingulate and the left anterior cingulate, then the linear correlation between the whole brain and the anterior cingulates was calculated to find out the abnormal functional connectivity of the anterior cingulates.

Contrasted experimental group with the healthy controls, the [functional connectivity](#) of bilateral [fusiform gyrus](#), [caudate nucleus](#), and the anterior cingulates was increased in the opiate drug addicts during physical detoxification group ($P < 0.05$), and the functional connectivity between anterior cingulates and polus temporalis, hippocampi, [Middle frontal gyrus](#) of orbit, [Supplementary motor area](#), dorsolateral superior frontal gyrus was decreased ($P < 0.05$).

The anterior cingulates dysfunction of functional connectivity in a cue-elicited craving task may play a important role in the relapse of opiate drug addicts during physical detoxification ¹⁾.

Pica is most often reported in the presence of [iron](#) deficiency or gastrointestinal disturbance. The mechanism that underlies the behavior is poorly understood. Lesions to the [anterior cingulate gyrus](#) (ACG) can present in many ways, with signs and symptoms including motor and sensory changes, autonomic dysfunction, seizures, and behavioral alterations.

To date, no reports of [pica](#), or eating disturbances, have been tied to anterior cingulate cortex lesions. In a article, Rangwala et al., describe the case of an 8-year-old boy presenting with pica consumption

of paper who was shown to have a mass in the left ACG. After surgical resection of the lesion, all of the patient's symptoms resolved and he returned to his normal life ²⁾.

The [somatosensory cortex](#) encodes incoming sensory information from receptors all over the body. Affective touch is a type of sensory information that elicits an emotional reaction and is usually social in nature, such as a physical human touch. This type of information actually coded differently than other sensory information. Intensity of affective touch is still encoded in the primary somatosensory cortex, but the feeling of pleasantness associated with affective touch activates the [anterior cingulate cortex](#) more than the primary somatosensory cortex. Functional magnetic resonance imaging (fMRI) data shows that increased blood oxygen level contrast (BOLD) signal in the anterior cingulate cortex as well as the prefrontal cortex is highly correlated with pleasantness scores of an affective touch. Inhibitory transcranial magnetic stimulation (TMS) of the primary somatosensory cortex inhibits the perception of affective touch intensity, but not affective touch pleasantness. Therefore, the S1 is not directly involved in processing socially affective touch pleasantness, but still plays a role in discriminating touch location and intensity.

Qiao et al. reported a case of refractory epilepsy characterized by aura of extreme fear and hypermotor seizures, in which the left (dominant hemisphere) anterior cingulate gyrus (ACG) was determined to be the epileptogenic zone (EZ) through multiple modalities of presurgical evaluation including analysis of high frequency oscillation on intracranial EEG. Tailored resection of EZ was thus performed and pathological examination revealed focal cortical dysplasia (FCD) type IIb. The patient has been seizure free during an 18-month follow-up. The report has provided novel anatomical, electrophysiological and surgical evidences suggesting the critical role of ACG in ictal fear and possibility of surgical management of fear-manifesting refractory epilepsy ³⁾.

Impaired [wakefulness](#) (IW) in [normal pressure hydrocephalus](#) (NPH) is associated with reduced relative [regional cerebral blood flow](#) (rrCBF) in the [anterior cingulate cortex](#). Improved wakefulness following surgery corresponds to rrCBF increments in the frontal association cortex ⁴⁾.

References

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Han Y, Sun T, Zheng XL, Jiang ZQ, Lou FY, Zhang SJ. [Task-related functional connectivity of anterior cingulate in opiate drug addicts during physical detoxification: a task fMRI study]. *Zhonghua Yi Xue Za Zhi*. 2019 Mar 5;99(9):700-703. doi: 10.3760/cma.j.issn.0376-2491.2019.09.013. Chinese. PubMed PMID: 30831621.

²⁾

Rangwala SD, Tobin MK, Birk DM, Butts JT, Nikas DC, Hahn YS. Pica in a Child with Anterior Cingulate Gyrus Oligodendroglioma: Case Report. *Pediatr Neurosurg*. 2017;52(4):279-283. doi: 10.1159/000477816. Epub 2017 Jul 14. PubMed PMID: 28704833.

³⁾

Qiao L, Yu T, Ni D, Wang X, Xu C, Liu C, Zhang G, Li Y. Correlation between extreme fear and focal cortical dysplasia in anterior cingulate gyrus: Evidence from a surgical case of refractory epilepsy. *Clin Neurol Neurosurg*. 2017 Oct 31;163:121-123. doi: 10.1016/j.clineuro.2017.10.025. [Epub ahead of

print] PubMed PMID: 29101860.

⁴⁾

Tullberg M, Hellström P, Piechnik SK, Starmark JE, Wikkelsö C. Impaired wakefulness is associated with reduced anterior cingulate CBF in patients with normal pressure hydrocephalus. *Acta Neurol Scand*. 2004 Nov;110(5):322-30. PubMed PMID: 15476461.

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