The anterior nucleus of the thalamus (ANT) has connections with limbic structures, anterior cingulate cortex, and orbitomedial prefrontal cortex; thus, it plays a vital role in memory processes and in emotional and executive functions [1].

---

The anterior nucleus of thalamus (ANT) is a key component of the hippocampal system for episodic memory. The ANT consist of 3 subnuclei with distinct connectivity with the subicular cortex, retrosplenial cortex, and mammillary bodies. Via its connections with the anterior cingulate and orbitomedial prefrontal cortex, the ANT may also contribute to reciprocal hippocampal-prefrontal interactions involved in emotional and executive functions. As in other thalamic nuclei, neurons of the ANT have 2 different state-dependent patterns of discharge, tonic and burst-firing; some ANT neurons also contribute to propagation of the theta rhythm, which is important for mechanisms of synaptic plasticity of the hippocampal circuit. Clinical and experimental evidence indicate that damage of the ANT or its inputs from the mammillary bodies are primarily responsible for the episodic memory deficit observed in Wernicke-Korsakoff syndrome and thalamic stroke. Experimental models also indicate that the ANT may have a role in the propagation of seizure activity both in absence and in focal seizures. Because of its central connectivity and possible role in propagation of seizure activity, the ANT has become an attractive target for deep brain stimulation (DBS) for treatment of medically refractory epilepsy. The ANT is one of the nuclei preferentially affected in prion disorders, such as fatal familial insomnia, but the relationship between ANT involvement and the clinical manifestations of these disorders remains unclear.

# Deep Brain Stimulation for epilepsy

Deep Brain Stimulation for epilepsy

1)
Child ND, Benarroch EE. Anterior nucleus of the thalamus: functional organization and clinical implications. Neurology. 2013 Nov 19;81(21):1869-76. doi: 10.1212/01.wnl.0000436078.95856.56. Epub 2013 Oct 18. PMID: 24142476.