Amygdala

Last updated: September 13, 2019

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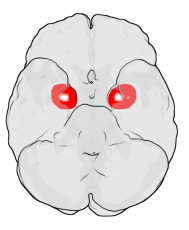
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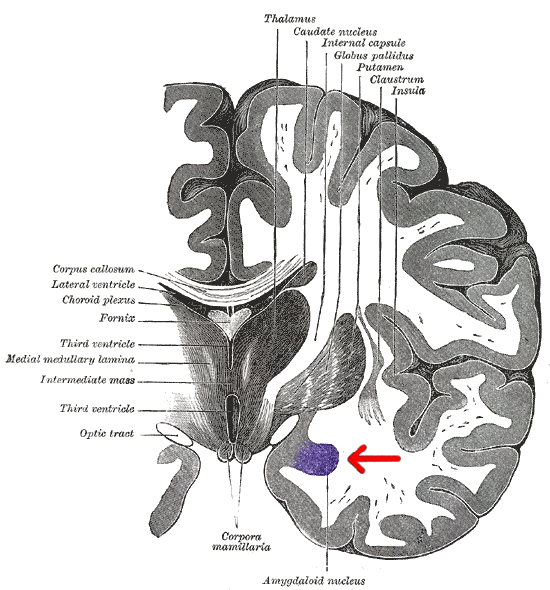
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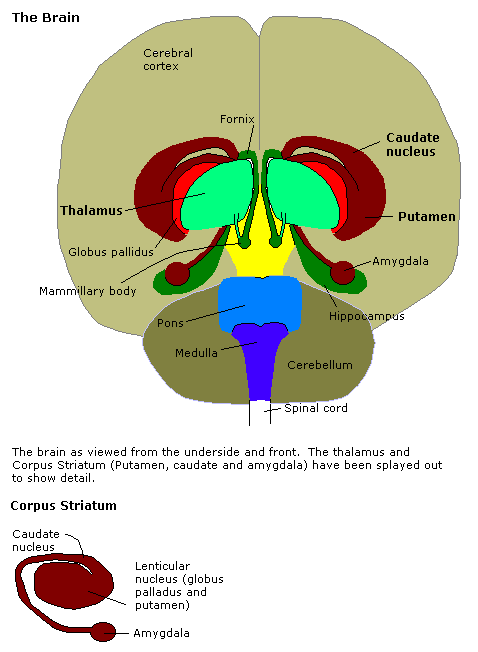
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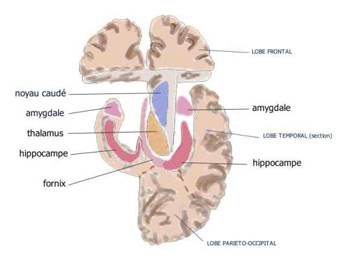
Anatomy

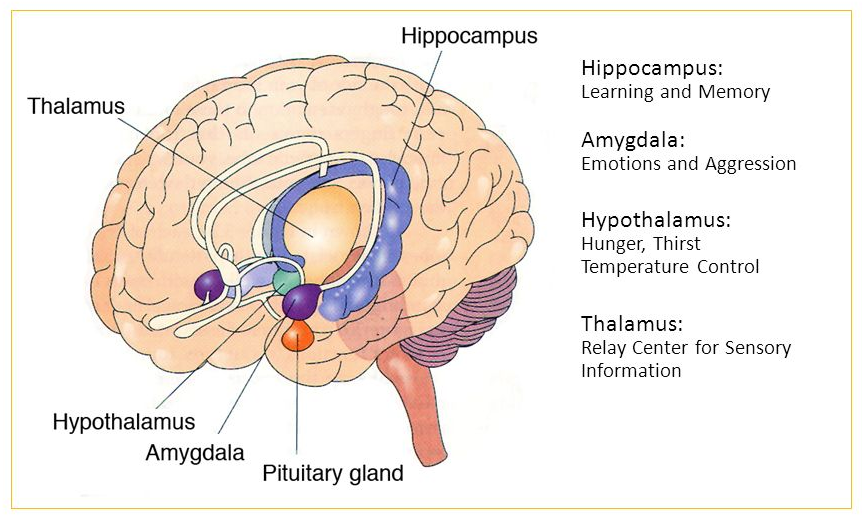
* almond-shaped structure.
* average size in humans 1.24-1.63 cm³
* one portion is a ventromedial extension of the striatum, a second part comprising the caudal olfactory cortex, and a third region representing the ventromedial extension of the claustrum.
* amygdala has been subdivided based on its histological characteristics into 2 major areas (anterior amygdaloid area and corticoamygdaloid transition area), 6 nuclei (central, medial, cortical, accessory basal, basal, and lateral), and 1 intercalated cell group.

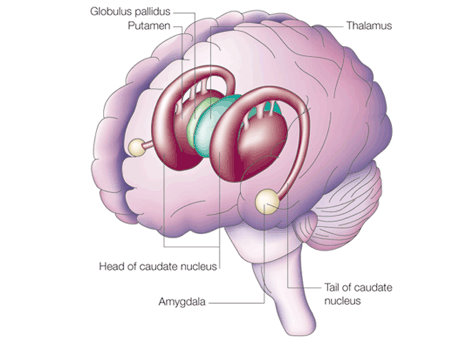


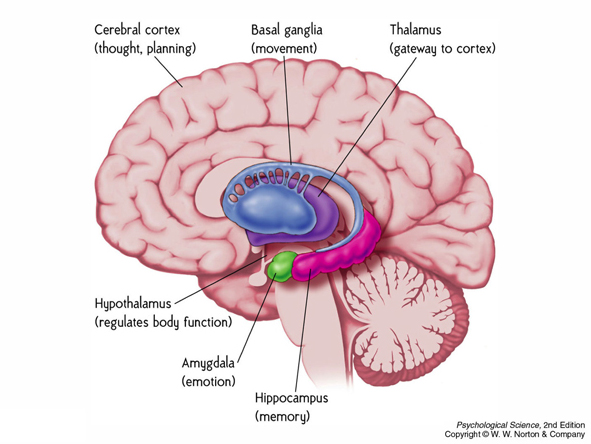




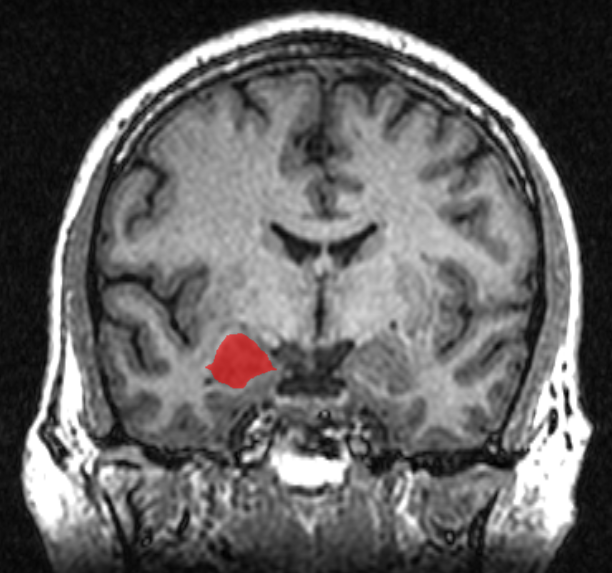






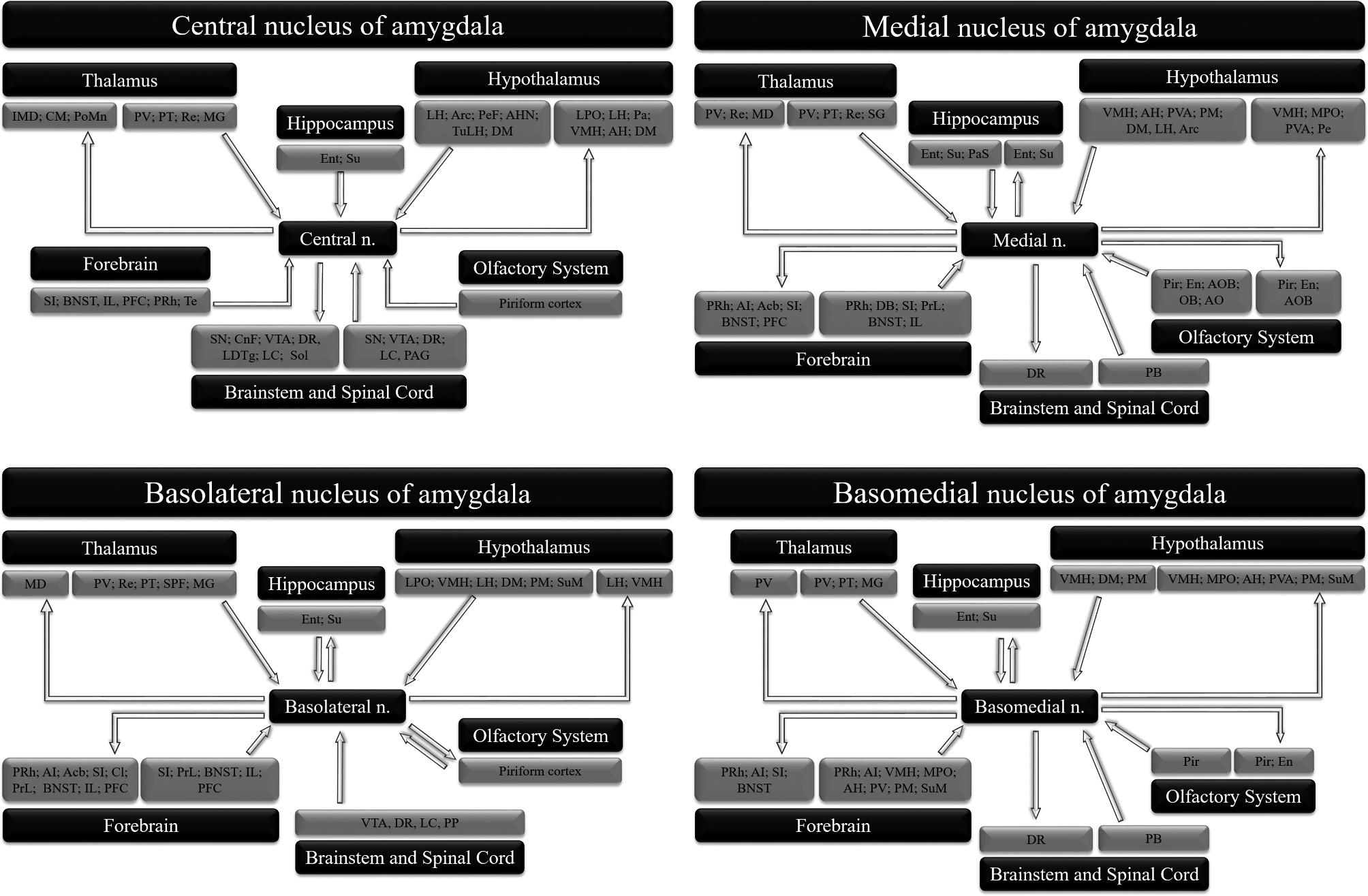


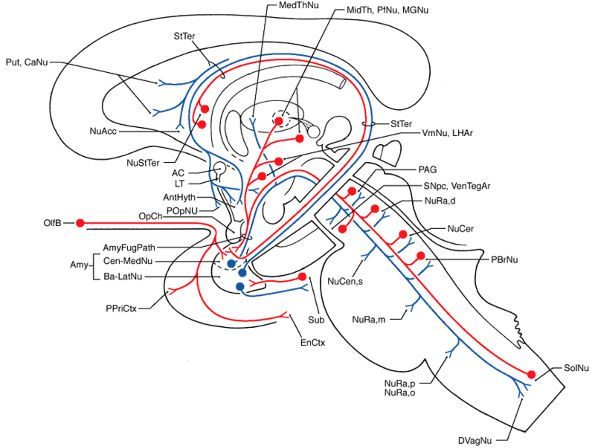
Imaging

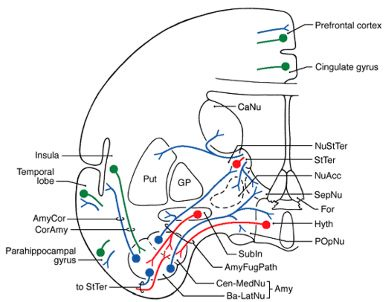


Connections

Schematic representation of the main connections of the central, medial, basolateral, and basomedial amygdala nuclei. Acb: nucleus accumbens; AH: anterior hypothalamic area; AHN: anterior hypothalamic nucleus; AI: agranular insular cortex; AO: anterior olfactory nucleus; AOB: accessory olfactory bulb; Arc: arcuate nucleus of the hypothalamus; BNST: bed nucleus of the stria terminalis; Cl: claustrum; CM: central medial thalamic nucleus; CnF: cuneiform nucleus; DB: nucleus of the diagonal band; DM: dorsomedial hypothalamic nucleus; DR: dorsal raphe nucleus; En: endopiriform nucleus; Ent: entorhinal cortex; GP: globus pallidus; IL: infralimbic cortex; IMD: intermediodorsal thalamic nucleus; LC: locus coeruleus; LDTg: laterodorsal tegmental nucleus; LH: lateral hypothalamic area; LPO: lateral preoptic area; MD: mediodorsal thalamic nucleus; MG: medial geniculate nucleus; MPO: medial preoptic area; OB: olfactory bulb; Pa: paraventricular hypothalamic nucleus; PAG: periaqueductal gray; PaS: parasubiculum; PB: parabrachial nucleus; Pe: periventricular hypothalamic nucleus; PeF: perifornical nucleus; PFC: prefrontal cortex; Pir: piriform cortex; PM: premammillary nucleus; PoMn: posteromedial thalamic nucleus; PP: peripeduncular nucleus; PRh: perirhinal cortex; PrL: prelimbic cortex; PT: paratenial thalamic nucleus; PV: paraventricular nucleus of the thalamus; PVA: paraventricular nucleus of the hypothalamus; Re: reuniens thalamic nucleus; SG: suprageniculate thalamic nucleus; SI: substantia innominate; SN: substantia nigra; Sol: nucleus of the solitary tract; SPF: subparafascicular thalamic nucleus; Su: subiculum; SuM: supramammillary nucleus; Te: temporal cortex; TuLH: tuberal region of lateral hypothalamus; VMH: ventromedial hypothalamic nucleus; VTA: ventral tegmental area.







AC – Anterior commissure

Amy – Amygdaloid nuclear complex

AmyCor – Amygdalocortical fibers

AmyFugPath – Amygdalofugal pathway

AntHyth – Anterior hypothalamus

Ba-LatNu – Basal and lateral nuclei

CaNu – Caudate nucleus

Cen-MedNu – Central, cortical and medial nuclei

CorAmy – Corticoamygdaloid fibers

DVagNu – Dorsal motor vagal nucleus

EnCtx – Entorhinal cortex

For – Fornix

GP – Globus pallidus

Hyth – Hypothalamus

LT – Lamina terminalis

LHAr – Lateral hypothalamic area

MedThNu – Medial thalamic nuclei

MGNu – Medial geniculate nucleus

MidTh – Midline thalamic nuclei

NuAcc – Nucleus accumbens

NuCen, s – Nucleus centralis, superior

NuCer – Nucleus ceruleus

NuRa, d – Nucleus raphe, dorsalis

NuRa, m – Nucleus raphe, magnus

NuRa, o – Nucleus raphe, obscurus

NuRa, p – Nucleus raphe, pallidus

NuStTer – Nucleus of the stria terminalis

OlfB – Olfactory bulb

OpCh – Optic chiasm

PAG – Periaqueductal (central) gray

PBrNu – Parabrachial nuclei

PfNu – Parafascicular nucleus

Pi – Pineal

POpNu – Preoptic nucleus

PPriCtx – Prepiriform cortex

Put – Putamen

SepNu – Septal nuclei

SNpc – Substantia nigra, pars compacta

SolNu – Solitary nucleus

StTer – Stria terminalis

Sub – Subiculum

Subln – Substantia innominata

VenTegAr – Ventral tegmental area

VmNu – Ventromedial hypothalamic nucleus

Function

* amygdala plays a critical role in processing threatening stimuli and mediating autonomic, neuroendocrine, and behavioral responses that enable an organism to adapt to social and environmental challenges.

Lesions

Etiology of lesions:

1. trauma to temporal lobes
2. herpes simplex encephalitis
3. bilateral temporal lobe epileptic surgery
4. CNS degenerative disorders (e.g. Alzheimer disease, Pick disease).

Clinically - behavioral changes - **Klüver-Bucy syndrome**:

1. visual, tactile, and auditory agnosia → hypermetamorphosis (intense desire to explore immediate environment) → hyperorality
2. hyperphagia or other dietary manifestations
3. placidity
4. hypersexuality (in form of comments, suggestions, and attempts to make sexual contact (e.g. touching) rather than in actual intercourse or masturbation).

Bibliography for ch. “Limbic System” → follow this [link >>](http://www.neurosurgeryresident.net/A.%20Neuroscience%20Basics\A.%20Bibliography.pdf)

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