Anterior thalamic deep brain stimulation

Anticonvulsive effect of anterior thalamic deep brain stimulation in super-refractory status epilepticus crucially depends on active stimulation zone-A single case observation [1)].

Unclassified

1: Imbach LL, Baumann CR, Poryazova R, Geissler O, Brugger P, Sarnthein J, Mothersill I, Weller M, Oertel MF, Stieglitz LH. Anticonvulsive effect of anterior thalamic deep brain stimulation in super-refractory status epilepticus crucially depends on active stimulation zone-A single case observation. Seizure. 2019 Aug 28;71:286-288. doi: 10.1016/j.seizure.2019.08.015. [Epub ahead of print] PubMed PMID: 31493681.

2: Yuan L, Zhang S, Liang S, Liu N, Yu X, Liang S. Deep brain stimulation of the anterior nucleus of the thalamus in a patient with super-refractory convulsive status epilepticus. Epileptic Disord. 2019 Aug 1;21(4):379-384. doi: 10.1684/epd.2019.1086. PubMed PMID: 31403465.

3: Lee DJ, Lozano CS, Dallapiazza RF, Lozano AM. Current and future directions of deep brain stimulation for neurological and psychiatric disorders. J Neurosurg. 2019 Aug 1;131(2):333-342. doi: 10.3171/2019.4.JNS181761. Review. PubMed PMID: 31370011.

4: DiMarzio M, Rashid T, Hancu I, Fiveland E, Prusik J, Gillogly M, Madhavan R, Joel S, Durphy J, Molho E, Hanspal E, Shin D, Pilitsis JG. Functional MRI Signature of Chronic Pain Relief From Deep Brain Stimulation in Parkinson Disease Patients. Neurosurgery. 2019 Jul 17. pii: nyz269. doi: 10.1093/neuros/nyz269. [Epub ahead of print] PubMed PMID: 31313816.

5: Levi V, Cordella R, D'Ammando A, Tringali G, Dones I, Messina G, Franzini A. Dorsal anterior cingulate cortex (ACC) deep brain stimulation (DBS): a promising surgical option for the treatment of refractory thalamic pain syndrome (TPS). Acta Neurochir (Wien). 2019 Aug;161(8):1579-1588. doi: 10.1007/s00701-019-03975-5. Epub 2019 Jun 17. PubMed PMID: 31209628.

6: Johnson KA, Fletcher PT, Servello D, Bona A, Porta M, Ostrem JL, Bardinet E, Welter ML, Lozano AM, Baldermann JC, Kuhn J, Huys D, Foltynie T, Hariz M, Joyce EM, Zrinzo L, Kefalopoulou Z, Zhang JG, Meng FG, Zhang C, Ling Z, Xu X, Yu X, Smeets AY, Ackermans L, Visser-Vandewalle V, Mogilner AY, Pourfar MH, Almeida L, Gunduz A, Hu W, Foote KD, Okun MS, Butson CR. Image-based analysis and long-term clinical outcomes of deep brain stimulation for Tourette syndrome: a multisite study. J Neurol Neurosurg Psychiatry. 2019 May 25. pii: jnnp-2019-320379. doi: 10.1136/jnnp-2019-320379. [Epub ahead of print] PubMed PMID: 31129620.

7: Hamdi H, Robin E, Stahl JP, Doche E, Azulay JP, Chabardes S, Bartolomei F, Regis J. Anterior Thalamic Stimulation Induced Relapsing Encephalitis. Stereotact Funct Neurosurg. 2019;97(2):132-136. doi: 10.1159/000499072. Epub 2019 May 3. PubMed PMID: 31055582.

8: Zhu GY, Chen YC, Du TT, Liu DF, Zhang X, Liu YY, Yuan TS, Shi L, Zhang JG. The Accuracy and Feasibility of Robotic Assisted Lead Implantation in Nonhuman Primates. Neuromodulation. 2019 Jun;22(4):441-450. doi: 10.1111/ner.12951. Epub 2019 Apr 23. PubMed PMID: 31012530.

9: Hidding U, Schaper M, Moll CKE, Gulberti A, Köppen J, Buhmann C, Gerloff C, Pötter-Nerger M,

Hamel W, Choe CU. Mapping stimulation-induced beneficial and adverse effects in the subthalamic area of essential tremor patients. Parkinsonism Relat Disord. 2019 Apr 3. pii: S1353-8020(19)30194-4. doi: 10.1016/j.parkreldis.2019.03.028. [Epub ahead of print] PubMed PMID: 30981663.

10: Roland JL, Smyth MD. Recent advances in the neurosurgical treatment of pediatric epilepsy: JNSPG 75th Anniversary Invited Review Article. J Neurosurg Pediatr. 2019 Apr 5;23(4):411-421. doi: 10.3171/2018.12.PEDS18350. PubMed PMID: 30970205.

11: Strotzer QD, Anthofer JM, Faltermeier R, Brawanski AT, Torka E, Waldthaler JA, Kohl Z, Fellner C, Beer AL, Schlaier JR. Deep brain stimulation: Connectivity profile for bradykinesia alleviation. Ann Neurol. 2019 Jun;85(6):852-864. doi: 10.1002/ana.25475. Epub 2019 Apr 30. PubMed PMID: 30937956.

12: Wang YC, Grewal SS, Middlebrooks EH, Worrell GA, Stead M, Lundstrom BN, Britton JW, Wu MH, Van Gompel JJ. Targeting analysis of a novel parietal approach for deep brain stimulation of the anterior nucleus of the thalamus for epilepsy. Epilepsy Res. 2019 Jul;153:1-6. doi: 10.1016/j.eplepsyres.2019.03.010. Epub 2019 Mar 19. PubMed PMID: 30913474.

13: Elder C, Friedman D, Devinsky O, Doyle W, Dugan P. Responsive neurostimulation targeting the anterior nucleus of the thalamus in 3 patients with treatment-resistant multifocal epilepsy. Epilepsia Open. 2019 Jan 29;4(1):187-192. doi: 10.1002/epi4.12300. eCollection 2019 Mar. PubMed PMID: 30868130; PubMed Central PMCID: PMC6398101.

14: Dibué-Adjei M, Kamp MA, Vonck K. 30 years of vagus nerve stimulation trials in epilepsy: Do we need neuromodulation-specific trial designs? Epilepsy Res. 2019 Jul;153:71-75. doi: 10.1016/j.eplepsyres.2019.02.004. Epub 2019 Feb 20. Review. PubMed PMID: 30824370.

15: Park YS, Sammartino F, Young NA, Corrigan J, Krishna V, Rezai AR. Anatomical review of the ventral capsule/ventral striatum and the nucleus accumbens to guide target selection for deep brain stimulation for obsessive-compulsive disorder. World Neurosurg. 2019 Feb 18. pii: S1878-8750(19)30372-9. doi: 10.1016/j.wneu.2019.01.254. [Epub ahead of print] Review. PubMed PMID: 30790738.

16: Costentin G, Derrey S, Gérardin E, Cruypeninck Y, Pressat-Laffouilhere T, Anouar Y, Wallon D, Le Goff F, Welter ML, Maltête D. White matter tracts lesions and decline of verbal fluency after deep brain stimulation in Parkinson's disease. Hum Brain Mapp. 2019 Jun 15;40(9):2561-2570. doi: 10.1002/hbm.24544. Epub 2019 Feb 18. PubMed PMID: 30779251.

17: Bagatti D, D'Ammando A, Franzini A, Messina G. Deep Brain Stimulation of the Caudal Zona Incerta/Motor Thalamus for Post-Ischemic Dystonic Tremor of the Left Upper Limb. Case Report and Review of the Literature. World Neurosurg. 2019 Feb 8. pii: S1878-8750(19)30294-3. doi: 10.1016/j.wneu.2019.01.183. [Epub ahead of print] PubMed PMID: 30738935.

18: Avecillas-Chasin JM, Poologaindran A, Morrison MD, Rammage LA, Honey CR. Unilateral Thalamic Deep Brain Stimulation for Voice Tremor. Stereotact Funct Neurosurg. 2018;96(6):392-399. doi: 10.1159/000495413. Epub 2019 Jan 9. PubMed PMID: 30625492.

19: Novais F, Pestana LC, Loureiro S, Andrea M, Figueira ML, Pimentel J. Predicting de novo psychopathology after epilepsy surgery: A 3-year cohort study. Epilepsy Behav. 2019 Jan;90:204-208. doi: 10.1016/j.yebeh.2018.11.037. Epub 2018 Dec 17. PubMed PMID: 30573340.

20: Yan H, Toyota E, Anderson M, Abel TJ, Donner E, Kalia SK, Drake J, Rutka JT, Ibrahim GM. A systematic review of deep brain stimulation for the treatment of drug-resistant epilepsy in childhood. J Neurosurg Pediatr. 2018 Nov 30;23(3):274-284. doi: 10.3171/2018.9.PEDS18417. Review. PubMed PMID: 30544364.

21: Tuleasca C, Régis J, Najdenovska E, Witjas T, Girard N, Bolton T, Delaire F, Vincent M, Faouzi M, Thiran JP, Bach Cuadra M, Levivier M, Van de Ville D. Pretherapeutic resting-state fMRI profiles are associated with MR signature volumes after stereotactic radiosurgical thalamotomy for essential tremor. J Neurosurg. 2018 Dec 1;129(Suppl1):63-71. doi: 10.3171/2018.7.GKS18752. PubMed PMID: 30544321.

22: Liebrand LC, Caan MWA, Schuurman PR, van den Munckhof P, Figee M, Denys D, van Wingen GA. Individual white matter bundle trajectories are associated with deep brain stimulation response in obsessive-compulsive disorder. Brain Stimul. 2019 Mar - Apr;12(2):353-360. doi: 10.1016/j.brs.2018.11.014. Epub 2018 Nov 27. PubMed PMID: 30522916.

23: Shimizu T, Maruo T, Miura S, Kishima H, Ushio Y, Goto S. Stereotactic Lesioning of the Thalamic Vo Nucleus for the Treatment of Writer's Cramp (Focal Hand Dystonia). Front Neurol. 2018 Nov 26;9:1008. doi: 10.3389/fneur.2018.01008. eCollection 2018. PubMed PMID: 30534112; PubMed Central PMCID: PMC6275197.

24: Isaacs DA, Butler J, Sukul V, Rodriguez W, Pallavaram S, Tolleson C, Fang JY, Phibbs FT, Yu H, Konrad PE, Hedera P. Confined Thalamic Deep Brain Stimulation in Refractory Essential Tremor. Stereotact Funct Neurosurg. 2018;96(5):296-304. doi: 10.1159/000493546. Epub 2018 Nov 19. PubMed PMID: 30453287.

25: Herrman H, Egge A, Konglund AE, Ramm-Pettersen J, Dietrichs E, Taubøll E. Anterior thalamic deep brain stimulation in refractory epilepsy: A randomized, double-blinded study. Acta Neurol Scand. 2019 Mar;139(3):294-304. doi: 10.1111/ane.13047. Epub 2018 Dec 11. PubMed PMID: 30427061.

26: Gillinder L, Lehn A, Papacostas J, Olson S, Blum S, Dionisio S. Refractory epilepsy secondary to anti-GAD encephalitis treated with DBS post SEEG evaluation: a novel case report based on stimulation findings. Epileptic Disord. 2018 Oct 1;20(5):451-456. doi: 10.1684/epd.2018.0993. PubMed PMID: 30361184.

27: Koeppen JA, Nahravani F, Kramer M, Voges B, House PM, Gulberti A, Moll CKE, Westphal M, Hamel W. Electrostimulation of the Anterior Thalamus for Epilepsy: Clinical Outcome and Analysis of Efficient Target. Neuromodulation. 2019 Jun;22(4):465-471. doi: 10.1111/ner.12865. Epub 2018 Oct 8. PubMed PMID: 30295358.

28: Hitti FL, Vaughan KA, Ramayya AG, McShane BJ, Baltuch GH. Reduced long-term cost and increased patient satisfaction with rechargeable implantable pulse generators for deep brain stimulation. J Neurosurg. 2018 Sep 1:1-8. doi: 10.3171/2018.4.JNS172995. [Epub ahead of print] PubMed PMID: 30265199.

29: Son BC, Shon YM, Kim SH, Kim J, Ko HC, Choi JG. Technical Implications in Revision Surgery for Deep Brain Stimulation (DBS) of the Thalamus for Refractory Epilepsy. J Epilepsy Res. 2018 Jun 30;8(1):12-19. doi: 10.14581/jer.18003. eCollection 2018 Jun. PubMed PMID: 30090757; PubMed Central PMCID: PMC6066694.

30: Grewal SS, Middlebrooks EH, Kaufmann TJ, Stead M, Lundstrom BN, Worrell GA, Lin C, Baydin S, Van Gompel JJ. Fast gray matter acquisition T1 inversion recovery MRI to delineate the mammillothalamic tract for preoperative direct targeting of the anterior nucleus of the thalamus for

deep brain stimulation in epilepsy. Neurosurg Focus. 2018 Aug;45(2):E6. doi: 10.3171/2018.4.FOCUS18147. PubMed PMID: 30064328.

31: Klinger N, Mittal S. Deep brain stimulation for seizure control in drug-resistant epilepsy. Neurosurg Focus. 2018 Aug;45(2):E4. doi: 10.3171/2018.4.FOCUS1872. PubMed PMID: 30064326.

32: Zhu G, Meng D, Chen Y, Du T, Liu Y, Liu D, Shi L, Jiang Y, Zhang X, Zhang J. Anterior nucleus of thalamus stimulation inhibited abnormal mossy fiber sprouting in kainic acid-induced epileptic rats. Brain Res. 2018 Dec 15;1701:28-35. doi: 10.1016/j.brainres.2018.07.014. Epub 2018 Jul 17. PubMed PMID: 30025975.

33: Yu T, Wang X, Li Y, Zhang G, Worrell G, Chauvel P, Ni D, Qiao L, Liu C, Li L, Ren L, Wang Y. High-frequency stimulation of anterior nucleus of thalamus desynchronizes epileptic network in humans. Brain. 2018 Sep 1;141(9):2631-2643. doi: 10.1093/brain/awy187. PubMed PMID: 29985998.

34: Schaper FLWVJ, Zhao Y, Janssen MLF, Wagner GL, Colon AJ, Hilkman DMW, Gommer E, Vlooswijk MCG, Hoogland G, Ackermans L, Bour LJ, Van Wezel RJA, Boon P, Temel Y, Heida T, Van Kranen-Mastenbroek VHJM, Rouhl RPW. Single-Cell Recordings to Target the Anterior Nucleus of the Thalamus in Deep Brain Stimulation for Patients with Refractory Epilepsy. Int J Neural Syst. 2019 May;29(4):1850012. doi: 10.1142/S0129065718500120. Epub 2018 Apr 2. PubMed PMID: 29768988.

35: Son BC, Choi JG, Ha SW. Cerebrospinal Fluid Egress from the Quadripolar Deep Brain Stimulation Electrode for Anterior Nucleus of the Thalamus for Refractory Epilepsy. Asian J Neurosurg. 2018 Apr-Jun;13(2):407-410. doi: 10.4103/ajns.AJNS_148_16. PubMed PMID: 29682045; PubMed Central PMCID: PMC5898116.

36: Nowacki A, Schlaier J, Debove I, Pollo C. Validation of diffusion tensor imaging tractography to visualize the dentatorubrothalamic tract for surgical planning. J Neurosurg. 2018 Mar 23;130(1):99-108. doi: 10.3171/2017.9.JNS171321. PubMed PMID: 29570012.

37: Lehtimäki K, Coenen VA, Gonçalves Ferreira A, Boon P, Elger C, Taylor RS, Ryvlin P, Gil-Nagel A, Gielen F, Brionne TC, Abouihia A, Beth G; MORE investigators. The Surgical Approach to the Anterior Nucleus of Thalamus in Patients With Refractory Epilepsy: Experience from the International Multicenter Registry (MORE). Neurosurgery. 2019 Jan 1;84(1):141-150. doi: 10.1093/neuros/nyy023. PubMed PMID: 29554309.

38: Dandekar MP, Fenoy AJ, Carvalho AF, Soares JC, Quevedo J. Deep brain stimulation for treatment-resistant depression: an integrative review of preclinical and clinical findings and translational implications. Mol Psychiatry. 2018 May;23(5):1094-1112. doi: 10.1038/mp.2018.2. Epub 2018 Feb 27. Review. PubMed PMID: 29483673.

39: Hupalo M, Wojcik R, Jaskolski DJ. Intracerebral electroencephalography in targeting anterior thalamic nucleus for deep brain stimulation in refractory epilepsy. Neurol Neurochir Pol. 2018 May - Jun;52(3):379-385. doi: 10.1016/j.pjnns.2018.01.003. Epub 2018 Feb 6. PubMed PMID: 29454470.

40: Kohl S, Baldermann JC. Progress and challenges in deep brain stimulation for obsessive-compulsive disorder. Pharmacol Ther. 2018 Jun;186:168-175. doi: 10.1016/j.pharmthera.2018.01.011. Epub 2018 Jan 31. Review. PubMed PMID: 29406245.

41: Carlson JD, McLeod KE, Mark JB, McLeod PS, Bremer BA. Dysgeusia in deep brain stimulation for essential tremor. J Clin Neurosci. 2018 Apr;50:242-246. doi: 10.1016/j.jocn.2018.01.013. PubMed

PMID: 29402567.

42: Akram H, Dayal V, Mahlknecht P, Georgiev D, Hyam J, Foltynie T, Limousin P, De Vita E, Jahanshahi M, Ashburner J, Behrens T, Hariz M, Zrinzo L. Connectivity derived thalamic segmentation in deep brain stimulation for tremor. Neuroimage Clin. 2018 Jan 28;18:130-142. doi: 10.1016/j.nicl.2018.01.008. eCollection 2018. PubMed PMID: 29387530; PubMed Central PMCID: PMC5790021.

43: Ibrahim GM, Wong S, Morgan BR, Lipsman N, Fallah A, Weil AG, Krishna V, Wennberg RA, Lozano AA. Phase-amplitude coupling within the anterior thalamic nuclei during seizures. J Neurophysiol. 2018 Apr 1;119(4):1497-1505. doi: 10.1152/jn.00832.2017. Epub 2017 Dec 27. PubMed PMID: 29357461.

44: Martinez-Ramirez D, Jimenez-Shahed J, Leckman JF, Porta M, Servello D, Meng FG, Kuhn J, Huys D, Baldermann JC, Foltynie T, Hariz MI, Joyce EM, Zrinzo L, Kefalopoulou Z, Silburn P, Coyne T, Mogilner AY, Pourfar MH, Khandhar SM, Auyeung M, Ostrem JL, Visser-Vandewalle V, Welter ML, Mallet L, Karachi C, Houeto JL, Klassen BT, Ackermans L, Kaido T, Temel Y, Gross RE, Walker HC, Lozano AM, Walter BL, Mari Z, Anderson WS, Changizi BK, Moro E, Zauber SE, Schrock LE, Zhang JG, Hu W, Rizer K, Monari EH, Foote KD, Malaty IA, Deeb W, Gunduz A, Okun MS. Efficacy and Safety of Deep Brain Stimulation in Tourette Syndrome: The International Tourette Syndrome Deep Brain Stimulation Public Database and Registry. JAMA Neurol. 2018 Mar 1;75(3):353-359. doi: 10.1001/jamaneurol.2017.4317. Erratum in: JAMA Neurol. 2018 Mar;75(3):384. PubMed PMID: 29340590; PubMed Central PMCID: PMC5885852.

45: Sandoe C, Krishna V, Basha D, Sammartino F, Tatsch J, Picillo M, di Biase L, Poon YY, Hamani C, Reddy D, Munhoz RP, Lozano AM, Hutchison WD, Fasano A. Predictors of deep brain stimulation outcome in tremor patients. Brain Stimul. 2018 May - Jun;11(3):592-599. doi: 10.1016/j.brs.2017.12.014. Epub 2018 Jan 2. PubMed PMID: 29330020.

46: Tuleasca C, Najdenovska E, Régis J, Witjas T, Girard N, Champoudry J, Faouzi M, Thiran JP, Bach Cuadra M, Levivier M, Van De Ville D. Pretherapeutic functional neuroimaging predicts tremor arrest after thalamotomy. Acta Neurol Scand. 2018 May;137(5):500-508. doi: 10.1111/ane.12891. Epub 2018 Jan 7. PubMed PMID: 29315459.

47: Bouwens van der Vlis TAM, Schijns OEMG, Schaper FLWVJ, Hoogland G, Kubben P, Wagner L, Rouhl R, Temel Y, Ackermans L. Deep brain stimulation of the anterior nucleus of the thalamus for drug-resistant epilepsy. Neurosurg Rev. 2019 Jun;42(2):287-296. doi: 10.1007/s10143-017-0941-x. Epub 2018 Jan 6. Review. PubMed PMID: 29306976; PubMed Central PMCID: PMC6502776.

48: Kundu B, Schrock L, Davis T, House PA. Thalamic Deep Brain Stimulation for Essential Tremor Also Reduces Voice Tremor. Neuromodulation. 2018 Dec;21(8):748-754. doi: 10.1111/ner.12739. Epub 2017 Dec 12. PubMed PMID: 29232019.

49: Li JJ, Shi L, Chen YC, Zhu GY, Zhang JG. Ultrahigh-Magnitude Brain Magnetic Resonance Imaging Scan on Rhesus Monkeys With Implanted Deep Brain Stimulation Hardware. Neuromodulation. 2018 Feb;21(2):168-175. doi: 10.1111/ner.12735. Epub 2017 Dec 8. PubMed PMID: 29219219.

50: Balak N, Balkuv E, Karadag A, Basaran R, Biceroglu H, Erkan B, Tanriover N. Mammillothalamic and Mammillotegmental Tracts as New Targets for Dementia and Epilepsy Treatment. World Neurosurg. 2018 Feb;110:133-144. doi: 10.1016/j.wneu.2017.10.168. Epub 2017 Nov 10. Review. PubMed PMID: 29129763.

51: Basha D, Dostrovsky JO, Kalia SK, Hodaie M, Lozano AM, Hutchison WD. Gamma oscillations in the somatosensory thalamus of a patient with a phantom limb: case report. J Neurosurg. 2018

Oct;129(4):1048-1055. doi: 10.3171/2017.5.JNS17170. Epub 2017 Nov 10. PubMed PMID: 29125416.

52: Kim SH, Lim SC, Yang DW, Cho JH, Son BC, Kim J, Hong SB, Shon YM. Thalamo-cortical network underlying deep brain stimulation of centromedian thalamic nuclei in intractable epilepsy: a multimodal imaging analysis. Neuropsychiatr Dis Treat. 2017 Oct 17;13:2607-2619. doi: 10.2147/NDT.S148617. eCollection 2017. PubMed PMID: 29089767; PubMed Central PMCID: PMC5655132.

53: Raymaekers S, Luyten L, Bervoets C, Gabriëls L, Nuttin B. Deep brain stimulation for treatment-resistant major depressive disorder: a comparison of two targets and long-term follow-up. Transl Psychiatry. 2017 Oct 31;7(10):e1251. doi: 10.1038/tp.2017.66. PubMed PMID: 29087373; PubMed Central PMCID: PMC5682606.

54: Chazen JL, Sarva H, Stieg PE, Min RJ, Ballon DJ, Pryor KO, Riegelhaupt PM, Kaplitt MG. Clinical improvement associated with targeted interruption of the cerebellothalamic tract following MR-guided focused ultrasound for essential tremor. J Neurosurg. 2018 Aug;129(2):315-323. doi: 10.3171/2017.4.JNS162803. Epub 2017 Oct 20. PubMed PMID: 29053074.

55: Kim SH, Lim SC, Kim J, Son BC, Lee KJ, Shon YM. Long-term follow-up of anterior thalamic deep brain stimulation in epilepsy: A 11-year, single center experience. Seizure. 2017 Nov;52:154-161. doi: 10.1016/j.seizure.2017.10.009. Epub 2017 Oct 14. PubMed PMID: 29040867.

56: Ferreira ES, Vieira LG, Moraes DM, Amorim BO, Malheiros JM, Hamani C, Covolan L. Long-Term Effects of Anterior Thalamic Nucleus Deep Brain Stimulation on Spatial Learning in the Pilocarpine Model of Temporal Lobe Epilepsy. Neuromodulation. 2018 Feb;21(2):160-167. doi: 10.1111/ner.12688. Epub 2017 Sep 28. PubMed PMID: 28960670.

57: Chang B, Xu J. Deep brain stimulation for refractory temporal lobe epilepsy: a systematic review and meta-analysis with an emphasis on alleviation of seizure frequency outcome. Childs Nerv Syst. 2018 Feb;34(2):321-327. doi: 10.1007/s00381-017-3596-6. Epub 2017 Sep 18. PubMed PMID: 28921161.

58: Chen YC, Zhu GY, Wang X, Shi L, Du TT, Liu DF, Liu YY, Jiang Y, Zhang X, Zhang JG. Anterior thalamic nuclei deep brain stimulation reduces disruption of the blood-brain barrier, albumin extravasation, inflammation and apoptosis in kainic acid-induced epileptic rats. Neurol Res. 2017 Dec;39(12):1103-1113. doi: 10.1080/01616412.2017.1379241. Epub 2017 Sep 18. PubMed PMID: 28918702.

59: King NKK, Krishna V, Sammartino F, Bari A, Reddy GD, Hodaie M, Kalia SK, Fasano A, Munhoz RP, Lozano AM, Hamani C. Anatomic Targeting of the Optimal Location for Thalamic Deep Brain Stimulation in Patients with Essential Tremor. World Neurosurg. 2017 Nov;107:168-174. doi: 10.1016/j.wneu.2017.07.136. Epub 2017 Jul 31. PubMed PMID: 28774764.

60: Chen YC, Shi L, Zhu GY, Wang X, Liu DF, Liu YY, Jiang Y, Zhang X, Zhang JG. Effects of anterior thalamic nuclei deep brain stimulation on neurogenesis in epileptic and healthy rats. Brain Res. 2017 Oct 1;1672:65-72. doi: 10.1016/j.brainres.2017.07.021. Epub 2017 Jul 29. PubMed PMID: 28764934.

61: Raju SS, Niranjan A, Monaco EA, Flickinger JC, Lunsford LD. Stereotactic radiosurgery for medically refractory multiple sclerosis-related tremor. J Neurosurg. 2018 Apr;128(4):1214-1221. doi: 10.3171/2017.1.JNS162512. Epub 2017 Jun 30. Review. PubMed PMID: 28665251.

62: Oliveria SF, Rodriguez RL, Bowers D, Kantor D, Hilliard JD, Monari EH, Scott BM, Okun MS, Foote KD. Safety and efficacy of dual-lead thalamic deep brain stimulation for patients with treatment-refractory multiple sclerosis tremor: a single-centre, randomised, single-blind, pilot trial. Lancet Neurol. 2017 Sep;16(9):691-700. doi: 10.1016/S1474-4422(17)30166-7. Epub 2017 Jun 20. PubMed PMID: 28642125.

63: Bot M, van den Munckhof P, Bakay R, Stebbins G, Verhagen Metman L. Accuracy of Intraoperative Computed Tomography during Deep Brain Stimulation Procedures: Comparison with Postoperative Magnetic Resonance Imaging. Stereotact Funct Neurosurg. 2017;95(3):183-188. doi: 10.1159/000475672. Epub 2017 Jun 10. PubMed PMID: 28601874; PubMed Central PMCID: PMC5516417.

64: Lendvai IS, Kinfe TM. Migraine Improvement After Anterior Thalamic Deep Brain Stimulation for Drug-Resistant Idiopathic Generalized Seizure: A Case Report. Headache. 2017 Jun;57(6):964-966. doi: 10.1111/head.13097. Epub 2017 May 2. PubMed PMID: 28466541.

65: Niranjan A, Raju SS, Monaco EA, Flickinger JC, Lunsford LD. Is staged bilateral thalamic radiosurgery an option for otherwise surgically ineligible patients with medically refractory bilateral tremor? J Neurosurg. 2018 Feb;128(2):617-626. doi: 10.3171/2016.11.JNS162044. Epub 2017 Apr 7. PubMed PMID: 28387629.

66: Poologaindran A, Ivanishvili Z, Morrison MD, Rammage LA, Sandhu MK, Polyhronopoulos NE, Honey CR. The effect of unilateral thalamic deep brain stimulation on the vocal dysfunction in a patient with spasmodic dysphonia: interrogating cerebellar and pallidal neural circuits. J Neurosurg. 2018 Feb;128(2):575-582. doi: 10.3171/2016.10.JNS161025. Epub 2017 Mar 17. PubMed PMID: 28304188.

67: Kim W, Sharim J, Tenn S, Kaprealian T, Bordelon Y, Agazaryan N, Pouratian N. Diffusion tractography imaging-guided frameless linear accelerator stereotactic radiosurgical thalamotomy for tremor: case report. J Neurosurg. 2018 Jan;128(1):215-221. doi: 10.3171/2016.10.JNS161603. Epub 2017 Feb 24. PubMed PMID: 28298033; PubMed Central PMCID: PMC5568966.

68: Silva SM, Cunha-Cabral D, Andrade JP. Neurosurgical relevance of the dissection of the diencephalic white matter tracts using the Klingler technique. Clin Neurol Neurosurg. 2017 May;156:35-40. doi: 10.1016/j.clineuro.2017.03.001. Epub 2017 Mar 2. PubMed PMID: 28292695.

69: Thuberg D, Voges J, Holtkamp M, Schmitt FC. Patience can be a virtue with deep brain stimulation of the anterior thalami: another case report. Epileptic Disord. 2017 Mar 1;19(1):114-115. doi: 10.1684/epd.2017.0903. PubMed PMID: 28256446.

70: Smeets AYJM, Duits AA, Leentjens AFG, Schruers K, van Kranen-Mastenbroek V, Visser-Vandewalle V, Temel Y, Ackermans L. Thalamic Deep Brain Stimulation for Refractory Tourette Syndrome: Clinical Evidence for Increasing Disbalance of Therapeutic Effects and Side Effects at Long-Term Follow-Up. Neuromodulation. 2018 Feb;21(2):197-202. doi: 10.1111/ner.12556. Epub 2017 Jan 19. PubMed PMID: 28102636.

71: Chen YC, Zhu GY, Wang X, Shi L, Jiang Y, Zhang X, Zhang JG. Deep brain stimulation of the anterior nucleus of the thalamus reverses the gene expression of cytokines and their receptors as well as neuronal degeneration in epileptic rats. Brain Res. 2017 Feb 15;1657:304-311. doi: 10.1016/j.brainres.2016.12.020. Epub 2016 Dec 24. PubMed PMID: 28027874.

72: Meidahl AC, Orlowski D, Sørensen JC, Bjarkam CR. The Retrograde Connections and Anatomical Segregation of the Göttingen Minipig Nucleus Accumbens. Front Neuroanat. 2016 Dec 5;10:117.

eCollection 2016. PubMed PMID: 27994542; PubMed Central PMCID: PMC5136552.

73: Franco A, Pimentel J, Campos AR, Morgado C, Pinelo S, Ferreira AG, Bentes C. Stimulation of the bilateral anterior nuclei of the thalamus in the treatment of refractory epilepsy: two cases of subcortical band heterotopia. Epileptic Disord. 2016 Dec 1;18(4):426-430. doi: 10.1684/epd.2016.0878. PubMed PMID: 27965181.

74: Wennberg R, Del Campo JM, Shampur N, Rowland NC, Valiante T, Lozano AM, Garcia Dominguez L. Feasibility of magnetoencephalographic source imaging in patients with thalamic deep brain stimulation for epilepsy. Epilepsia Open. 2016 Dec 9;2(1):101-106. doi: 10.1002/epi4.12027. eCollection 2017 Mar. PubMed PMID: 29750219; PubMed Central PMCID: PMC5939388.

75: Lee CY, Lim SN, Wu T, Lee ST. Successful Treatment of Refractory Status Epilepticus Using Anterior Thalamic Nuclei Deep Brain Stimulation. World Neurosurg. 2017 Mar;99:14-18. doi: 10.1016/j.wneu.2016.11.097. Epub 2016 Nov 25. PubMed PMID: 27894945.

76: Wu C, D'Haese PF, Pallavaram S, Dawant BM, Konrad P, Sharan AD. Variations in Thalamic Anatomy Affect Targeting in Deep Brain Stimulation for Epilepsy. Stereotact Funct Neurosurg. 2016;94(6):387-396. doi: 10.1159/000449009. Epub 2016 Nov 16. PubMed PMID: 27846633; PubMed Central PMCID: PMC5285402.

77: Valentín A, Selway RP, Amarouche M, Mundil N, Ughratdar I, Ayoubian L, Martín-López D, Kazi F, Dar T, Jiménez-Jiménez D, Hughes E, Alarcón G. Intracranial stimulation for children with epilepsy. Eur J Paediatr Neurol. 2017 Jan;21(1):223-231. doi: 10.1016/j.ejpn.2016.10.011. Epub 2016 Nov 1. PubMed PMID: 27840024.

78: Hartl E, Feddersen B, Bötzel K, Mehrkens JH, Noachtar S. Seizure Control and Active Termination by Anterior Thalamic Deep Brain Stimulation. Brain Stimul. 2017 Jan - Feb;10(1):168-170. doi: 10.1016/j.brs.2016.10.003. Epub 2016 Oct 6. PubMed PMID: 27810228.

79: Dougherty DD, Chou T, Corse AK, Arulpragasam AR, Widge AS, Cusin C, Evans KC, Greenberg BD, Haber SN, Deckersbach T. Acute deep brain stimulation changes in regional cerebral blood flow in obsessive-compulsive disorder. J Neurosurg. 2016 Nov;125(5):1087-1093. Epub 2016 Feb 19. PubMed PMID: 26894459.

80: Garcia-Garcia D, Guridi J, Toledo JB, Alegre M, Obeso JA, Rodríguez-Oroz MC. Stimulation sites in the subthalamic nucleus and clinical improvement in Parkinson's disease: a new approach for active contact localization. J Neurosurg. 2016 Nov;125(5):1068-1079. Epub 2016 Feb 5. PubMed PMID: 26848922.

81: Son BC, Shon YM, Kim SH, Choi JG, Kim J. Relationship between Postoperative EEG Driving Response and Lead Location in Deep Brain Stimulation of the Anterior Nucleus of the Thalamus for Refractory Epilepsy. Stereotact Funct Neurosurg. 2016;94(5):336-341. Epub 2016 Oct 11. PubMed PMID: 27723660.

82: So RQ, Krishna V, King NKK, Yang H, Zhang Z, Sammartino F, Lozano AM, Wennberg RA, Guan C. Prediction and detection of seizures from simultaneous thalamic and scalp electroencephalography recordings. J Neurosurg. 2017 Jun;126(6):2036-2044. doi: 10.3171/2016.7.JNS161282. Epub 2016 Oct 7. PubMed PMID: 27715438.

83: Kim HY, Hur YJ, Kim HD, Park KM, Kim SE, Hwang TG. Modification of electrophysiological activity

pattern after anterior thalamic deep brain stimulation for intractable epilepsy: report of 3 cases. J Neurosurg. 2017 Jun;126(6):2028-2035. doi: 10.3171/2016.6.JNS152958. Epub 2016 Sep 16. PubMed PMID: 27636181.

84: Blahak C, Sauer T, Baezner H, Wolf ME, Saryyeva A, Schrader C, Capelle HH, Hennerici MG, Krauss JK. Long-term follow-up of chronic spinal cord stimulation for medically intractable orthostatic tremor. J Neurol. 2016 Nov;263(11):2224-2228. Epub 2016 Aug 13. PubMed PMID: 27522355.

85: Sweeney-Reed CM, Zaehle T, Voges J, Schmitt FC, Buentjen L, Kopitzki K, Richardson-Klavehn A, Hinrichs H, Heinze HJ, Knight RT, Rugg MD. Clinical, neuropsychological, and pre-stimulus dorsomedial thalamic nucleus electrophysiological data in deep brain stimulation patients. Data Brief. 2016 Jun 15;8:557-61. doi: 10.1016/j.dib.2016.06.008. eCollection 2016 Sep. PubMed PMID: 27508216; PubMed Central PMCID: PMC4961763.

86: Maarouf M, Neudorfer C, El Majdoub F, Lenartz D, Kuhn J, Sturm V. Deep Brain Stimulation of Medial Dorsal and Ventral Anterior Nucleus of the Thalamus in OCD: A Retrospective Case Series. PLoS One. 2016 Aug 9;11(8):e0160750. doi: 10.1371/journal.pone.0160750. eCollection 2016. PubMed PMID: 27504631; PubMed Central PMCID: PMC4978440.

87: Reddy S, Fenoy A, Furr-Stimming E, Schiess M, Mehanna R. Does the Use of Intraoperative Microelectrode Recording Influence the Final Location of Lead Implants in the Ventral Intermediate Nucleus for Deep Brain Stimulation? Cerebellum. 2017 Apr;16(2):421-426. doi: 10.1007/s12311-016-0816-7. PubMed PMID: 27491538.

88: Sweeney-Reed CM, Lee H, Rampp S, Zaehle T, Buentjen L, Voges J, Holtkamp M, Hinrichs H, Heinze HJ, Schmitt FC. Thalamic interictal epileptiform discharges in deep brain stimulated epilepsy patients. J Neurol. 2016 Oct;263(10):2120-6. doi: 10.1007/s00415-016-8246-5. Epub 2016 Aug 2. PubMed PMID: 27485172.

89: Son BC, Shon YM, Choi JG, Kim J, Ha SW, Kim SH, Lee SH. Clinical Outcome of Patients with Deep Brain Stimulation of the Centromedian Thalamic Nucleus for Refractory Epilepsy and Location of the Active Contacts. Stereotact Funct Neurosurg. 2016;94(3):187-97. doi: 10.1159/000446611. Epub 2016 Jul 20. PubMed PMID: 27434073.

90: Jiltsova E, Möttönen T, Fahlström M, Haapasalo J, Tähtinen T, Peltola J, Öhman J, Larsson EM, Kiekara T, Lehtimäki K. Imaging of Anterior Nucleus of Thalamus Using 1.5T MRI for Deep Brain Stimulation Targeting in Refractory Epilepsy. Neuromodulation. 2016 Dec;19(8):812-817. doi: 10.1111/ner.12468. Epub 2016 Jul 11. PubMed PMID: 27398710.

91: Gee LE, Walling I, Ramirez-Zamora A, Shin DS, Pilitsis JG. Subthalamic deep brain stimulation alters neuronal firing in canonical pain nuclei in a 6-hydroxydopamine lesioned rat model of Parkinson's disease. Exp Neurol. 2016 Sep;283(Pt A):298-307. doi: 10.1016/j.expneurol.2016.06.031. Epub 2016 Jul 1. PubMed PMID: 27373204.

92: Sweeney-Reed CM, Zaehle T, Voges J, Schmitt FC, Buentjen L, Kopitzki K, Richardson-Klavehn A, Hinrichs H, Heinze HJ, Knight RT, Rugg MD. Pre-stimulus thalamic theta power predicts human memory formation. Neuroimage. 2016 Sep;138:100-108. doi: 10.1016/j.neuroimage.2016.05.042. Epub 2016 May 19. PubMed PMID: 27208861.

93: Gibson WS, Ross EK, Han SR, Van Gompel JJ, Min HK, Lee KH. Anterior Thalamic Deep Brain Stimulation: Functional Activation Patterns in a Large Animal Model. Brain Stimul. 2016 Sep-Oct;9(5):770-773. doi: 10.1016/j.brs.2016.04.012. Epub 2016 Apr 15. PubMed PMID: 27160467; PubMed Central PMCID: PMC5007150.

94: Cukiert A. Commentary: Anterior Nucleus Deep Brain Stimulation for Refractory Epilepsy: Insights Into Patterns of Seizure Control and Efficacious Target. Neurosurgery. 2016 Jun;78(6):812. doi: 10.1227/NEU.0000000000001243. PubMed PMID: 27077595.

95: Meng DW, Liu HG, Yang AC, Zhang K, Zhang JG. Stimulation of Anterior Thalamic Nuclei Protects Against Seizures and Neuronal Apoptosis in Hippocampal CA3 Region of Kainic Acid-induced Epileptic Rats. Chin Med J (Engl). 2016 Apr 20;129(8):960-6. doi: 10.4103/0366-6999.179799. PubMed PMID: 27064042; PubMed Central PMCID: PMC4831532.

96: Gibson WS, Cho S, Abulseoud OA, Gorny KR, Felmlee JP, Welker KM, Klassen BT, Min HK, Lee KH. The Impact of Mirth-Inducing Ventral Striatal Deep Brain Stimulation on Functional and Effective Connectivity. Cereb Cortex. 2017 Mar 1;27(3):2183-2194. doi: 10.1093/cercor/bhw074. PubMed PMID: 27001680; PubMed Central PMCID: PMC5939229.

97: Girgis F, Miller JP. White matter stimulation for the treatment of epilepsy. Seizure. 2016 Apr;37:28-31. doi: 10.1016/j.seizure.2016.02.004. Epub 2016 Feb 19. Review. PubMed PMID: 26926734.

98: Baldermann JC, Schüller T, Huys D, Becker I, Timmermann L, Jessen F, Visser-Vandewalle V, Kuhn J. Deep Brain Stimulation for Tourette-Syndrome: A Systematic Review and Meta-Analysis. Brain Stimul. 2016 Mar-Apr;9(2):296-304. doi: 10.1016/j.brs.2015.11.005. Epub 2015 Dec 29. Review. PubMed PMID: 26827109.

99: Choi JG, Lee SH, Shon YM, Son BC. Long-Term Migration of a Deep Brain Stimulation (DBS) Lead in the Third Ventricle Caused by Cerebral Atrophy in a Patient with Anterior Thalamic Nucleus DBS. J Epilepsy Res. 2015 Dec 31;5(2):96-100. doi: 10.14581/jer.15016. eCollection 2015 Dec. PubMed PMID: 26819942; PubMed Central PMCID: PMC4724858.

100: Krishna V, King NK, Sammartino F, Strauss I, Andrade DM, Wennberg RA, Lozano AM. Anterior Nucleus Deep Brain Stimulation for Refractory Epilepsy: Insights Into Patterns of Seizure Control and Efficacious Target. Neurosurgery. 2016 Jun;78(6):802-11. doi: 10.1227/NEU.0000000000001197. PubMed PMID: 26813858.

101: Le Reste PJ, Haegelen C, Gibaud B, Moreau T, Morandi X. Connections of the dorsolateral prefrontal cortex with the thalamus: a probabilistic tractography study. Surg Radiol Anat. 2016 Aug;38(6):705-10. doi: 10.1007/s00276-015-1603-8. Epub 2015 Dec 22. PubMed PMID: 26696378.

102: Lehtimäki K, Möttönen T, Järventausta K, Katisko J, Tähtinen T, Haapasalo J, Niskakangas T, Kiekara T, Öhman J, Peltola J. Outcome based definition of the anterior thalamic deep brain stimulation target in refractory epilepsy. Brain Stimul. 2016 Mar-Apr;9(2):268-75. doi: 10.1016/j.brs.2015.09.014. Epub 2015 Oct 9. PubMed PMID: 26680105.

103: Klinger NV, Mittal S. Clinical efficacy of deep brain stimulation for the treatment of medically refractory epilepsy. Clin Neurol Neurosurg. 2016 Jan;140:11-25. doi: 10.1016/j.clineuro.2015.11.009. Epub 2015 Nov 14. Review. PubMed PMID: 26615464.

104: Krishna V, Sammartino F, King NK, So RQ, Wennberg R. Neuromodulation for Epilepsy. Neurosurg Clin N Am. 2016 Jan;27(1):123-31. doi: 10.1016/j.nec.2015.08.010. Epub 2015 Oct 24. Review. PubMed PMID: 26615114.

105: Štillová K, Jurák P, Chládek J, Chrastina J, Halámek J, Bočková M, Goldemundová S, Říha I, Rektor

I. The Role of Anterior Nuclei of the Thalamus: A Subcortical Gate in Memory Processing: An Intracerebral Recording Study. PLoS One. 2015 Nov 3;10(11):e0140778. doi: 10.1371/journal.pone.0140778. eCollection 2015. PubMed PMID: 26529407; PubMed Central PMCID: PMC4631321.

106: Walter U, Müller JU, Rösche J, Kirsch M, Grossmann A, Benecke R, Wittstock M, Wolters A. Magnetic resonance-transcranial ultrasound fusion imaging: A novel tool for brain electrode location. Mov Disord. 2016 Mar;31(3):302-9. doi: 10.1002/mds.26425. Epub 2015 Sep 12. PubMed PMID: 26362398.

107: Boccard SG, Fernandes HM, Jbabdi S, Van Hartevelt TJ, Kringelbach ML, Quaghebeur G, Moir L, Mancebo VP, Pereira EA, Fitzgerald JJ, Green AL, Stein J, Aziz TZ. Tractography Study of Deep Brain Stimulation of the Anterior Cingulate Cortex in Chronic Pain: Key to Improve the Targeting. World Neurosurg. 2016 Feb;86:361-70.e1-3. doi: 10.1016/j.wneu.2015.08.065. Epub 2015 Sep 4. PubMed PMID: 26344354.

108: Amorim BO, Covolan L, Ferreira E, Brito JG, Nunes DP, de Morais DG, Nobrega JN, Rodrigues AM, deAlmeida AC, Hamani C. Deep brain stimulation induces antiapoptotic and anti-inflammatory effects in epileptic rats. J Neuroinflammation. 2015 Sep 4;12:162. doi: 10.1186/s12974-015-0384-7. PubMed PMID: 26337974; PubMed Central PMCID: PMC4558969.

109: Yang AC, Shi L, Li LM, Li JJ, Jiang Y, Meng DW, Zhu GY, Chen YC, Lu DH, Zhang JG. Potential Protective Effects of Chronic Anterior Thalamic Nucleus Stimulation on Hippocampal Neurons in Epileptic Monkeys. Brain Stimul. 2015 Nov-Dec;8(6):1049-57. doi: 10.1016/j.brs.2015.07.041. Epub 2015 Aug 1. PubMed PMID: 26298643.

110: Winter C, Bregman T, Voget M, Raymond R, Hadar R, Nobrega JN, Hamani C. Acute high frequency stimulation of the prefrontal cortex or nucleus accumbens does not increase hippocampal neurogenesis in rats. J Psychiatr Res. 2015 Sep;68:27-9. doi: 10.1016/j.jpsychires.2015.05.012. Epub 2015 May 30. PubMed PMID: 26228396; PubMed Central PMCID: PMC5303012.

111: Alonso P, Cuadras D, Gabriëls L, Denys D, Goodman W, Greenberg BD, Jimenez-Ponce F, Kuhn J, Lenartz D, Mallet L, Nuttin B, Real E, Segalas C, Schuurman R, du Montcel ST, Menchon JM. Deep Brain Stimulation for Obsessive-Compulsive Disorder: A Meta-Analysis of Treatment Outcome and Predictors of Response. PLoS One. 2015 Jul 24;10(7):e0133591. doi: 10.1371/journal.pone.0133591. eCollection 2015. PubMed PMID: 26208305; PubMed Central PMCID: PMC4514753.

112: Piacentino M, Durisotti C, Garofalo PG, Bonanni P, Volzone A, Ranzato F, Beggio G. Anterior thalamic nucleus deep brain Stimulation (DBS) for drug-resistant complex partial seizures (CPS) with or without generalization: long-term evaluation and predictive outcome. Acta Neurochir (Wien). 2015 Sep;157(9):1525-32; discussion 1532. doi: 10.1007/s00701-015-2498-1. Epub 2015 Jul 8. PubMed PMID: 26153778.

113: Boccard SG, Pereira EA, Aziz TZ. Deep brain stimulation for chronic pain. J Clin Neurosci. 2015 Oct;22(10):1537-43. doi: 10.1016/j.jocn.2015.04.005. Epub 2015 Jun 26. Review. PubMed PMID: 26122383.

114: Hescham S, Jahanshahi A, Meriaux C, Lim LW, Blokland A, Temel Y. Behavioral effects of deep brain stimulation of different areas of the Papez circuit on memory- and anxiety-related functions. Behav Brain Res. 2015 Oct 1;292:353-60. doi: 10.1016/j.bbr.2015.06.032. Epub 2015 Jun 25. PubMed PMID: 26119240.

115: Möttönen T, Katisko J, Haapasalo J, Tähtinen T, Kiekara T, Kähärä V, Peltola J, Öhman J, Lehtimäki

K. Defining the anterior nucleus of the thalamus (ANT) as a deep brain stimulation target in refractory epilepsy: Delineation using 3 T MRI and intraoperative microelectrode recording. Neuroimage Clin. 2015 Mar 5;7:823-9. doi: 10.1016/j.nicl.2015.03.001. eCollection 2015. PubMed PMID: 26082891; PubMed Central PMCID: PMC4459042.

116: Hayes DJ, Lipsman N, Chen DQ, Woodside DB, Davis KD, Lozano AM, Hodaie M. Subcallosal Cingulate Connectivity in Anorexia Nervosa Patients Differs From Healthy Controls: A Multi-tensor Tractography Study. Brain Stimul. 2015 Jul-Aug;8(4):758-68. doi: 10.1016/j.brs.2015.03.005. Epub 2015 May 21. PubMed PMID: 26073966.

117: Voges BR, Schmitt FC, Hamel W, House PM, Kluge C, Moll CK, Stodieck SR. Deep brain stimulation of anterior nucleus thalami disrupts sleep in epilepsy patients. Epilepsia. 2015 Aug;56(8):e99-e103. doi: 10.1111/epi.13045. Epub 2015 Jun 4. PubMed PMID: 26041007.

118: Cleary DR, Ozpinar A, Raslan AM, Ko AL. Deep brain stimulation for psychiatric disorders: where we are now. Neurosurg Focus. 2015 Jun;38(6):E2. doi: 10.3171/2015.3.FOCUS1546. Review. PubMed PMID: 26030702.

119: Zhang C, Hu WH, Wu DL, Zhang K, Zhang JG. Behavioral effects of deep brain stimulation of the anterior nucleus of thalamus, entorhinal cortex and fornix in a rat model of Alzheimer's disease. Chin Med J (Engl). 2015 May 5;128(9):1190-5. doi: 10.4103/0366-6999.156114. PubMed PMID: 25947402; PubMed Central PMCID: PMC4831546.

120: Kowski AB, Voges J, Heinze HJ, Oltmanns F, Holtkamp M, Schmitt FC. Nucleus accumbens stimulation in partial epilepsy–a randomized controlled case series. Epilepsia. 2015 Jun;56(6):e78-82. doi: 10.1111/epi.12999. Epub 2015 May 4. PubMed PMID: 25940212.

121: Akakın A, Yılmaz B, Kılıç T, Rhoton AL Jr. Anatomy of the subthalamic nucleus, with correlation of deep brain stimulation [RETRACTED]. J Neurosurg. 2015 Apr 24. doi: 10.3171/2014.10.JNS145. Epub 2015 Apr 24. Retraction in: J Neurosurg. 2016 Jan;124(1):278. J Neurosurg. 2016 Jan;2016(1):278. PubMed PMID: 25909575.

122: Selvakumar T, Alavian KN, Tierney T. Analysis of gene expression changes in the rat hippocampus after deep brain stimulation of the anterior thalamic nucleus. J Vis Exp. 2015 Mar 8;(97). doi: 10.3791/52457. PubMed PMID: 25867749; PubMed Central PMCID: PMC4401213.

123: Kilbane C, Ramirez-Zamora A, Ryapolova-Webb E, Qasim S, Glass GA, Starr PA, Ostrem JL. Pallidal stimulation for Holmes tremor: clinical outcomes and single-unit recordings in 4 cases. J Neurosurg. 2015 Jun;122(6):1306-14. doi: 10.3171/2015.2.JNS141098. Epub 2015 Mar 20. PubMed PMID: 25794341.

124: Schüller T, Gruendler TO, Jocham G, Klein TA, Timmermann L, Visser-Vandewalle V, Kuhn J, Ullsperger M. Rapid feedback processing in human nucleus accumbens and motor thalamus. Neuropsychologia. 2015 Apr;70:246-54. doi: 10.1016/j.neuropsychologia.2015.02.032. Epub 2015 Feb 26. PubMed PMID: 25726897.

125: Pepper J, Hariz M, Zrinzo L. Deep brain stimulation versus anterior capsulotomy for obsessive-compulsive disorder: a review of the literature. J Neurosurg. 2015 May;122(5):1028-37. doi: 10.3171/2014.11.JNS132618. Epub 2015 Jan 30. Review. PubMed PMID: 25635480.

126: Eskandar EN. Editorial: Anterior capsulotomy and deep brain stimulation. J Neurosurg. 2015

May;122(5):1026. doi: 10.3171/2014.9.JNS14925. Epub 2015 Jan 30. PubMed PMID: 25635479.

127: Shi L, Yang AC, Li JJ, Meng DW, Jiang B, Zhang JG. Favorable modulation in neurotransmitters: effects of chronic anterior thalamic nuclei stimulation observed in epileptic monkeys. Exp Neurol. 2015 Mar;265:94-101. doi: 10.1016/j.expneurol.2015.01.003. Epub 2015 Jan 14. PubMed PMID: 25596526.

128: Anthofer JM, Steib K, Fellner C, Lange M, Brawanski A, Schlaier J. DTI-based deterministic fibre tracking of the medial forebrain bundle. Acta Neurochir (Wien). 2015 Mar;157(3):469-77. doi: 10.1007/s00701-014-2335-y. Epub 2015 Jan 15. PubMed PMID: 25585836.

129: Dürschmid S, Zaehle T, Hinrichs H, Heinze HJ, Voges J, Garrido MI, Dolan RJ, Knight RT. Sensory Deviancy Detection Measured Directly Within the Human Nucleus Accumbens. Cereb Cortex. 2016 Mar;26(3):1168-1175. doi: 10.1093/cercor/bhu304. Epub 2015 Jan 9. PubMed PMID: 25576536; PubMed Central PMCID: PMC4737607.

130: Mathon B, Bédos-Ulvin L, Baulac M, Dupont S, Navarro V, Carpentier A, Cornu P, Clemenceau S. [Evolution of ideas and techniques, and future prospects in epilepsy surgery]. Rev Neurol (Paris). 2015 Feb;171(2):141-56. doi: 10.1016/j.neurol.2014.09.010. Epub 2014 Dec 29. Review. French. PubMed PMID: 25554491.

131: Jaseja H. Expanding the therapeutic spectrum of anterior thalamic nucleus deep brain stimulation in intractable epilepsy: a postulation. Epilepsy Behav. 2015 Feb;43:46-7. doi: 10.1016/j.yebeh.2014.11.013. Epub 2014 Dec 29. PubMed PMID: 25553391.

132: Sweeney-Reed CM, Zaehle T, Voges J, Schmitt FC, Buentjen L, Kopitzki K, Esslinger C, Hinrichs H, Heinze HJ, Knight RT, Richardson-Klavehn A. Corticothalamic phase synchrony and cross-frequency coupling predict human memory formation. Elife. 2014 Dec 23;3:e05352. doi: 10.7554/eLife.05352. PubMed PMID: 25535839; PubMed Central PMCID: PMC4302268.

133: Le Goff F, Derrey S, Lefaucheur R, Borden A, Fetter D, Jan M, Wallon D, Maltête D. Decline in verbal fluency after subthalamic nucleus deep brain stimulation in Parkinson's disease: a microlesion effect of the electrode trajectory? J Parkinsons Dis. 2015;5(1):95-104. doi: 10.3233/JPD-140443. PubMed PMID: 25374271.

134: Miranda MF, Hamani C, de Almeida AC, Amorim BO, Macedo CE, Fernandes MJ, Nobrega JN, Aarão MC, Madureira AP, Rodrigues AM, Andersen ML, Tufik S, Mello LE, Covolan L. Role of adenosine in the antiepileptic effects of deep brain stimulation. Front Cell Neurosci. 2014 Oct 2;8:312. doi: 10.3389/fncel.2014.00312. eCollection 2014. PubMed PMID: 25324724; PubMed Central PMCID: PMC4183090.

135: Keifer OP Jr, Riley JP, Boulis NM. Deep brain stimulation for chronic pain: intracranial targets, clinical outcomes, and trial design considerations. Neurosurg Clin N Am. 2014 Oct;25(4):671-92. doi: 10.1016/j.nec.2014.07.009. Review. PubMed PMID: 25240656; PubMed Central PMCID: PMC4659490.

136: Schlaier J, Anthofer J, Steib K, Fellner C, Rothenfusser E, Brawanski A, Lange M. Deep brain stimulation for essential tremor: targeting the dentato-rubro-thalamic tract? Neuromodulation. 2015 Feb;18(2):105-12. doi: 10.1111/ner.12238. Epub 2014 Sep 11. PubMed PMID: 25209587.

137: Han CL, Hu W, Stead M, Zhang T, Zhang JG, Worrell GA, Meng FG. Electrical stimulation of hippocampus for the treatment of refractory temporal lobe epilepsy. Brain Res Bull. 2014 Oct;109:13-21. doi: 10.1016/j.brainresbull.2014.08.007. Epub 2014 Sep 6. Review. PubMed PMID: 25200252.

138: Grabska N, Rudzińska M, Dec-Ćwiek M, Tutaj M, Pietraszko W, Michalski M, Szczudlik A. Deep brain stimulation in the treatment of Holmes tremor - a long-term case observation. Neurol Neurochir Pol. 2014;48(4):292-5. doi: 10.1016/j.pjnns.2014.06.002. Epub 2014 Jun 27. PubMed PMID: 25168330.

139: Seibell PJ, Hollander E. Management of obsessive-compulsive disorder. F1000Prime Rep. 2014 Aug 1;6:68. doi: 10.12703/P6-68. eCollection 2014. Review. PubMed PMID: 25165567; PubMed Central PMCID: PMC4126524.

140: Coenen VA, Allert N, Paus S, Kronenbürger M, Urbach H, Mädler B. Modulation of the cerebello-thalamo-cortical network in thalamic deep brain stimulation for tremor: a diffusion tensor imaging study. Neurosurgery. 2014 Dec;75(6):657-69; discussion 669-70. doi: 10.1227/NEU.0000000000000540. PubMed PMID: 25161000.

141: Yang JC, Papadimitriou G, Eckbo R, Yeterian EH, Liang L, Dougherty DD, Bouix S, Rathi Y, Shenton M, Kubicki M, Eskandar EN, Makris N. Multi-tensor investigation of orbitofrontal cortex tracts affected in subcaudate tractotomy. Brain Imaging Behav. 2015 Jun;9(2):342-52. doi: 10.1007/s11682-014-9314-z. PubMed PMID: 25103312; PubMed Central PMCID: PMC4320992.

142: Huys D, Bartsch C, Koester P, Lenartz D, Maarouf M, Daumann J, Mai JK, Klosterkötter J, Hunsche S, Visser-Vandewalle V, Woopen C, Timmermann L, Sturm V, Kuhn J. Motor Improvement and Emotional Stabilization in Patients With Tourette Syndrome After Deep Brain Stimulation of the Ventral Anterior and Ventrolateral Motor Part of the Thalamus. Biol Psychiatry. 2016 Mar 1;79(5):392-401. doi: 10.1016/j.biopsych.2014.05.014. Epub 2014 Jun 2. PubMed PMID: 25034948.

143: Covolan L, de Almeida AC, Amorim B, Cavarsan C, Miranda MF, Aarão MC, Madureira AP, Rodrigues AM, Nobrega JN, Mello LE, Hamani C. Effects of anterior thalamic nucleus deep brain stimulation in chronic epileptic rats. PLoS One. 2014 Jun 3;9(6):e97618. doi: 10.1371/journal.pone.0097618. eCollection 2014. PubMed PMID: 24892420; PubMed Central PMCID: PMC4043725.

144: Pereira EA, Aziz TZ. Neuropathic pain and deep brain stimulation. Neurotherapeutics. 2014 Jul;11(3):496-507. doi: 10.1007/s13311-014-0278-x. Review. PubMed PMID: 24867325; PubMed Central PMCID: PMC4121442.

145: Anthofer J, Steib K, Fellner C, Lange M, Brawanski A, Schlaier J. The variability of atlas-based targets in relation to surrounding major fibre tracts in thalamic deep brain stimulation. Acta Neurochir (Wien). 2014 Aug;156(8):1497-504; discussion 1504. doi: 10.1007/s00701-014-2103-z. Epub 2014 May 15. PubMed PMID: 24829155.

146: Suetens K, Nuttin B, Gabriëls L, Van Laere K. Differences in metabolic network modulation between capsulotomy and deep-brain stimulation for refractory obsessive-compulsive disorder. J Nucl Med. 2014 Jun;55(6):951-9. doi: 10.2967/jnumed.113.126409. Epub 2014 Apr 10. PubMed PMID: 24722531.

147: Stypulkowski PH, Stanslaski SR, Jensen RM, Denison TJ, Giftakis JE. Brain stimulation for epilepsy–local and remote modulation of network excitability. Brain Stimul. 2014 May-Jun;7(3):350-8. doi: 10.1016/j.brs.2014.02.002. Epub 2014 Feb 10. PubMed PMID: 24613614.

148: Chen N, Dong S, Yan T, Yan N, Ma Y, Yu C. High-frequency stimulation of anterior nucleus thalamus improves impaired cognitive function induced by intra-hippocampal injection of Aβ1-40 in rats. Chin Med J (Engl). 2014;127(1):125-9. PubMed PMID: 24384437.

149: Hardenacke K, Shubina E, Bührle CP, Zapf A, Lenartz D, Klosterkötter J, Visser-Vandewalle V, Kuhn J. Deep brain stimulation as a tool for improving cognitive functioning in Alzheimer's dementia: a systematic review. Front Psychiatry. 2013 Dec 4;4:159. doi: 10.3389/fpsyt.2013.00159. Review. PubMed PMID: 24363647; PubMed Central PMCID: PMC3850165.

150: Franzini A, Cordella R, Rizzi M, Marras CE, Messina G, Zorzi G, Caldiroli D. Deep brain stimulation in critical care conditions. J Neural Transm (Vienna). 2014 Apr;121(4):391-8. doi: 10.1007/s00702-013-1122-x. Epub 2013 Nov 30. PubMed PMID: 24292857.

151: Buentjen L, Kopitzki K, Schmitt FC, Voges J, Tempelmann C, Kaufmann J, Kanowski M. Direct targeting of the thalamic anteroventral nucleus for deep brain stimulation by T1-weighted magnetic resonance imaging at 3 T. Stereotact Funct Neurosurg. 2014;92(1):25-30. doi: 10.1159/000351525. Epub 2013 Nov 8. PubMed PMID: 24216749.

152: Rotsides J, Mammis A. The use of deep brain stimulation in Tourette's syndrome. Neurosurg Focus. 2013 Nov;35(5):E4. doi: 10.3171/2013.8.FOCUS13292. Review. PubMed PMID: 24175864.

153: Kim SH, Son BC, Lim SC, Kim WJ, Bae DW, Shon YM. EEG driving response during low-frequency stimulation of anterior thalamic nucleus: Is it a good predictor of the correct location of DBS electrode? Clin Neurophysiol. 2014 May;125(5):1065-6. doi: 10.1016/j.clinph.2013.09.010. Epub 2013 Oct 7. PubMed PMID: 24113329.

154: Pereira EA, Green AL, Aziz TZ. Deep brain stimulation for pain. Handb Clin Neurol. 2013;116:277-94. doi: 10.1016/B978-0-444-53497-2.00023-1. Review. PubMed PMID: 24112902.

155: Fisher RS. Deep brain stimulation for epilepsy. Handb Clin Neurol. 2013;116:217-34. doi: 10.1016/B978-0-444-53497-2.00017-6. Review. PubMed PMID: 24112896.

156: Paek SH. The role of ultra-high field magnetic resonance imaging for track density imaging: application in neuromodulation of the brain. World Neurosurg. 2015 Jan;83(1):4-6. doi: 10.1016/j.wneu.2013.09.033. Epub 2013 Sep 19. PubMed PMID: 24056219.

157: Ge Y, Hu W, Liu C, Zhang JG, Meng FG. Brain stimulation for treatment of refractory epilepsy. Chin Med J (Engl). 2013;126(17):3364-70. Review. PubMed PMID: 24033966.

158: Chang WS, Roh D, Kim CH, Chang JW. Combined bilateral anterior cingulotomy and ventral capsule/ventral striatum deep brain stimulation for refractory obsessive-compulsive disorder with major depression: do combined procedures have a long-term benefit? Restor Neurol Neurosci. 2013;31(6):723-32. doi: 10.3233/RNN-120290. PubMed PMID: 23979095.

159: Sarnthein J, Péus D, Baumann-Vogel H, Baumann CR, Sürücü O. Stimulation sites in the subthalamic nucleus projected onto a mean 3-D atlas of the thalamus and basal ganglia. Acta Neurochir (Wien). 2013 Sep;155(9):1655-60. doi: 10.1007/s00701-013-1780-3. Epub 2013 Jun 1. PubMed PMID: 23728503.

160: Lüttjohann A, van Luijtelaar G. Thalamic stimulation in absence epilepsy. Epilepsy Res. 2013 Sep;106(1-2):136-45. doi: 10.1016/j.eplepsyres.2013.03.009. Epub 2013 Apr 17. PubMed PMID: 23602552.

161: Chen N, Yan N, Liu C, Ge Y, Zhang JG, Meng FG. Neuroprotective effects of Electrostimulation of the anterior nucleus of the thalamus for hippocampus neurons in intractable epilepsy. Med Hypotheses. 2013 May;80(5):517-9. doi: 10.1016/j.mehy.2013.02.002. Epub 2013 Mar 5. PubMed PMID: 23481284.

162: Tykocki T, Mandat T, Kornakiewicz A, Koziara H, Nauman P. Deep brain stimulation for refractory epilepsy. Arch Med Sci. 2012 Nov 9;8(5):805-16. doi: 10.5114/aoms.2012.31135. Epub 2012 Oct 8. PubMed PMID: 23185188; PubMed Central PMCID: PMC3506228.

163: Schneider TM, Beynon C, Sartorius A, Unterberg AW, Kiening KL. Deep brain stimulation of the lateral habenular complex in treatment-resistant depression: traps and pitfalls of trajectory choice. Neurosurgery. 2013 Jun;72(2 Suppl Operative):ons184-93; discussion ons193. doi: 10.1227/NEU.0b013e318277a5aa. PubMed PMID: 23147781.

164: Rizzi M, Casazza M, Broggi G. Proceedings from the Workshop on Palliative Epilepsy Surgery: Why, when, how?: Organized by Marina Casazza and Giovanni Broggi on February 2-3, 2012, in Milano, Italy. World Neurosurg. 2013 Nov;80(5):e95-9. doi: 10.1016/j.wneu.2012.10.073. Epub 2012 Nov 3. PubMed PMID: 23131433.

165: Liu HG, Yang AC, Meng DW, Zhang K, Zhang JG. Effect of anterior nucleus of thalamus stimulation on glucose metabolism in hippocampus of epileptic rats. Chin Med J (Engl). 2012 Sep;125(17):3081-6. PubMed PMID: 22932185.

166: Lee KJ, Shon YM, Cho CB. Long-term outcome of anterior thalamic nucleus stimulation for intractable epilepsy. Stereotact Funct Neurosurg. 2012;90(6):379-85. doi: 10.1159/000339991. Epub 2012 Aug 23. PubMed PMID: 22922474.

167: Saleh C, Gonzalez V, Cif L, Coubes P. Deep brain stimulation of the globus pallidus internus and Gilles de la Tourette syndrome: Toward multiple networks modulation. Surg Neurol Int. 2012;3(Suppl 2):S127-42. doi: 10.4103/2152-7806.95424. Epub 2012 Apr 26. PubMed PMID: 22826816; PubMed Central PMCID: PMC3400493.

168: Jiménez F, Nicolini H, Lozano AM, Piedimonte F, Salín R, Velasco F. Electrostimulation of the inferior thalamic peduncle in the treatment of major depression and obsessive compulsive disorders. World Neurosurg. 2013 Sep-Oct;80(3-4):S30.e17-25. doi: 10.1016/j.wneu.2012.07.010. Epub 2012 Jul 21. Review. PubMed PMID: 22824558.

169: Laxton AW, Lozano AM. Deep brain stimulation for the treatment of Alzheimer disease and dementias. World Neurosurg. 2013 Sep-Oct;80(3-4):S28.e1-8. doi: 10.1016/j.wneu.2012.06.028. Epub 2012 Jun 19. Review. PubMed PMID: 22722036.

170: Bourne SK, Eckhardt CA, Sheth SA, Eskandar EN. Mechanisms of deep brain stimulation for obsessive compulsive disorder: effects upon cells and circuits. Front Integr Neurosci. 2012 Jun 14;6:29. doi: 10.3389/fnint.2012.00029. eCollection 2012. PubMed PMID: 22712007; PubMed Central PMCID: PMC3375018.

171: Viswanathan A, Jimenez-Shahed J, Baizabal Carvallo JF, Jankovic J. Deep brain stimulation for Tourette syndrome: target selection. Stereotact Funct Neurosurg. 2012;90(4):213-24. doi: 10.1159/000337776. Epub 2012 Jun 14. Review. PubMed PMID: 22699684.

172: Chabardès S, Polosan M, Krack P, Bastin J, Krainik A, David O, Bougerol T, Benabid AL. Deep brain stimulation for obsessive-compulsive disorder: subthalamic nucleus target. World Neurosurg. 2013 Sep-Oct;80(3-4):S31.e1-8. doi: 10.1016/j.wneu.2012.03.010. Epub 2012 Mar 30. Review. PubMed PMID: 22469523.

173: Lehman RM, Augustine JR. Evolution and rebirth of functional stereotaxy in the subthalamus.

World Neurosurg. 2013 Nov;80(5):521-33. doi: 10.1016/j.wneu.2012.03.006. Epub 2012 Mar 30. PubMed PMID: 22465370.

174: Luigjes J, de Kwaasteniet BP, de Koning PP, Oudijn MS, van den Munckhof P, Schuurman PR, Denys D. Surgery for psychiatric disorders. World Neurosurg. 2013 Sep-Oct;80(3-4):S31.e17-28. doi: 10.1016/j.wneu.2012.03.009. Epub 2012 Mar 30. Review. PubMed PMID: 22465369.

175: Fridley J, Thomas JG, Navarro JC, Yoshor D. Brain stimulation for the treatment of epilepsy. Neurosurg Focus. 2012 Mar;32(3):E13. doi: 10.3171/2012.1.FOCUS11334. Review. PubMed PMID: 22380854.

176: Hamani C, Stone SS, Garten A, Lozano AM, Winocur G. Memory rescue and enhanced neurogenesis following Electrostimulation of the anterior thalamus in rats treated with corticosterone. Exp Neurol. 2011 Nov;232(1):100-4. doi: 10.1016/j.expneurol.2011.08.023. Epub 2011 Aug 30. PubMed PMID: 21906593.

177: Pouratian N, Zheng Z, Bari AA, Behnke E, Elias WJ, Desalles AA. Multi-institutional evaluation of deep brain stimulation targeting using probabilistic connectivity-based thalamic segmentation. J Neurosurg. 2011 Nov;115(5):995-1004. doi: 10.3171/2011.7.JNS11250. Epub 2011 Aug 19. PubMed PMID: 21854118.

178: Caire F, Maubon A, Moreau JJ, Cuny E. The mamillothalamic tract is a good landmark for the anterior border of the subthalamic nucleus on axial MR images. Stereotact Funct Neurosurg. 2011;89(5):286-90. doi: 10.1159/000329356. Epub 2011 Aug 18. PubMed PMID: 21849812.

179: Cukiert A, Cukiert CM, Argentoni-Baldochi M, Baise C, Forster CR, Mello VA, Burattini JA, Lima AM. Intraoperative neurophysiological responses in epileptic patients submitted to hippocampal and thalamic deep brain stimulation. Seizure. 2011 Dec;20(10):748-53. doi: 10.1016/j.seizure.2011.07.003. Epub 2011 Jul 22. PubMed PMID: 21782475.

180: Duerden EG, Finnis KW, Peters TM, Sadikot AF. Three-dimensional somatotopic organization and probabilistic mapping of motor responses from the human internal capsule. J Neurosurg. 2011 Jun;114(6):1706-14. doi: 10.3171/2011.1.JNS10136. Epub 2011 Mar 4. PubMed PMID: 21375376.

181: Stypulkowski PH, Giftakis JE, Billstrom TM. Development of a large animal model for investigation of deep brain stimulation for epilepsy. Stereotact Funct Neurosurg. 2011;89(2):111-22. doi: 10.1159/000323343. Epub 2011 Feb 17. PubMed PMID: 21336007.

182: Basnayake SD, Hyam JA, Pereira EA, Schweder PM, Brittain JS, Aziz TZ, Green AL, Paterson DJ. Identifying cardiovascular neurocircuitry involved in the exercise pressor reflex in humans using functional neurosurgery. J Appl Physiol (1985). 2011 Apr;110(4):881-91. doi: 10.1152/japplphysiol.00639.2010. Epub 2010 Dec 16. PubMed PMID: 21164158.

183: Hariz MI, Robertson MM. Gilles de la Tourette syndrome and deep brain stimulation. Eur J Neurosci. 2010 Oct;32(7):1128-34. doi: 10.1111/j.1460-9568.2010.07415.x. Review. PubMed PMID: 21039952.

184: Hamani C, Dubiela FP, Soares JC, Shin D, Bittencourt S, Covolan L, Carlen PL, Laxton AW, Hodaie M, Stone SS, Ha Y, Hutchison WD, Lozano AM, Mello LE, Oliveira MG. Anterior thalamus deep brain stimulation at high current impairs memory in rats. Exp Neurol. 2010 Sep;225(1):154-62. doi: 10.1016/j.expneurol.2010.06.007. Epub 2010 Jun 14. PubMed PMID: 20558163.

185: Nowinski WL, Chua BC, Volkau I, Puspitasari F, Marchenko Y, Runge VM, Knopp MV. Simulation

and assessment of cerebrovascular damage in deep brain stimulation using a stereotactic atlas of vasculature and structure derived from multiple 3- and 7-tesla scans. J Neurosurg. 2010 Dec;113(6):1234-41. doi: 10.3171/2010.2.JNS091528. Epub 2010 Mar 26. PubMed PMID: 20345226.

186: Thobois S, Ardouin C, Lhommée E, Klinger H, Lagrange C, Xie J, Fraix V, Coelho Braga MC, Hassani R, Kistner A, Juphard A, Seigneuret E, Chabardes S, Mertens P, Polo G, Reilhac A, Costes N, LeBars D, Savasta M, Tremblay L, Quesada JL, Bosson JL, Benabid AL, Broussolle E, Pollak P, Krack P. Non-motor dopamine withdrawal syndrome after surgery for Parkinson's disease: predictors and underlying mesolimbic denervation. Brain. 2010 Apr;133(Pt 4):1111-27. doi: 10.1093/brain/awq032. Epub 2010 Mar 17. PubMed PMID: 20237128.

187: Burdick A, Foote KD, Goodman W, Ward HE, Ricciuti N, Murphy T, Haq I, Okun MS. Lack of benefit of accumbens/capsular deep brain stimulation in a patient with both tics and obsessive-compulsive disorder. Neurocase. 2010 Aug;16(4):321-30. doi: 10.1080/13554790903560422. Epub 2010 Feb 22. PubMed PMID: 20178034.

188: Kahane P, Depaulis A. Deep brain stimulation in epilepsy: what is next? Curr Opin Neurol. 2010 Apr;23(2):177-82. doi: 10.1097/WCO.0b013e3283374a39. Review. PubMed PMID: 20125010.

189: Kobayashi K, Katayama Y, Sumi K, Otaka T, Obuchi T, Kano T, Nagaoka T, Oshima H, Fukaya C, Yamamoto T, Atsumi H. Effects of electrode implantation angle on thalamic stimulation for treatment of tremor. Neuromodulation. 2010 Jan;13(1):31-6. doi: 10.1111/j.1525-1403.2009.00235.x. Epub 2009 Sep 2. PubMed PMID: 21992762.

190: Nagel SJ, Najm IM. Deep brain stimulation for epilepsy. Neuromodulation. 2009 Oct;12(4):270-80. doi: 10.1111/j.1525-1403.2009.00239.x. Epub 2009 Aug 24. PubMed PMID: 22151416.

191: Yu H, Hedera P, Fang J, Davis TL, Konrad PE. Confined stimulation using dual thalamic deep brain stimulation leads rescues refractory essential tremor: report of three cases. Stereotact Funct Neurosurg. 2009;87(5):309-13. doi: 10.1159/000230694. Epub 2009 Jul 29. Erratum in: Stereotact Funct Neurosurg. 2009;87(5):333. PubMed PMID: 19641342.

192: Lega BC, Halpern CH, Jaggi JL, Baltuch GH. Deep brain stimulation in the treatment of refractory epilepsy: update on current data and future directions. Neurobiol Dis. 2010 Jun;38(3):354-60. doi: 10.1016/j.nbd.2009.07.007. Epub 2009 Jul 23. Review. PubMed PMID: 19631750.

193: Sillay KA, Sani S, Starr PA. Deep brain stimulation for medically intractable cluster headache. Neurobiol Dis. 2010 Jun;38(3):361-8. doi: 10.1016/j.nbd.2009.05.020. Epub 2009 Jun 6. Review. PubMed PMID: 19501166.

194: Servello D, Sassi M, Brambilla A, Porta M, Haq I, Foote KD, Okun MS. De novo and rescue DBS leads for refractory Tourette syndrome patients with severe comorbid OCD: a multiple case report. J Neurol. 2009 Sep;256(9):1533-9. doi: 10.1007/s00415-009-5159-6. Epub 2009 May 13. PubMed PMID: 19437063.

195: Sani S, Shimamoto S, Turner RS, Levesque N, Starr PA. Microelectrode recording in the posterior hypothalamic region in humans. Neurosurgery. 2009 Mar;64(3 Suppl):ons161-7; discussion ons167-9. doi: 10.1227/01.NEU.0000334051.91501.E3. PubMed PMID: 19240565; PubMed Central PMCID: PMC3777657.

196: Neuner I, Podoll K, Janouschek H, Michel TM, Sheldrick AJ, Schneider F. From psychosurgery to

neuromodulation: deep brain stimulation for intractable Tourette syndrome. World J Biol Psychiatry. 2009;10(4 Pt 2):366-76. doi: 10.1080/15622970802513317. Review. PubMed PMID: 19005877.

197: Papavassiliou E, Rau G, Heath S, Abosch A, Barbaro NM, Larson PS, Lamborn K, Starr PA. Thalamic deep brain stimulation for essential tremor: relation of lead location to outcome. Neurosurgery. 2008 Feb;62 Suppl 2:884-94. doi: 10.1227/01.neu.0000316290.83360.7e. PubMed PMID: 18596419.

198: Sedrak M, Gorgulho A, De Salles AF, Frew A, Behnke E, Ishida W, Klochkov T, Malkasian D. The role of modern imaging modalities on deep brain stimulation targeting for mental illness. Acta Neurochir Suppl. 2008;101:3-7. PubMed PMID: 18642626.

199: Velasco F, Velasco AL, Velasco M, Carrillo-Ruiz JD, Castro G, Trejo D, Núñez JM. [Central nervous system neuromodulation for the treatment of epilepsy]. Neurochirurgie. 2008 May;54(3):418-27. doi: 10.1016/j.neuchi.2008.02.034. Epub 2008 May 2. Review. French. PubMed PMID: 18448133.

200: Velasco F, Velasco M, Velasco AL, Rocha L, Carrillo-Ruiz JD, Castro G, Cuéllar-Herrera M. [Central nervous system neuromodulation for the treatment of epilepsy. II. Mechanisms of action and perspectives]. Neurochirurgie. 2008 May;54(3):428-35. doi: 10.1016/j.neuchi.2008.02.033. Epub 2008 May 2. Review. French. PubMed PMID: 18448132.

201: Heuer GG, Zaghloul KA, Jaggi JL, Baltuch GH. Use of an integrated platform system in the placement of deep brain stimulators. Neurosurgery. 2008 Mar;62(3 Suppl 1):245-7; discussion 247-8. doi: 10.1227/01.neu.0000317399.00842.fa. PubMed PMID: 18424992.

202: Pilitsis JG, Chu Y, Kordower J, Bergen DC, Cochran EJ, Bakay RA. Postmortem study of deep brain stimulation of the anterior thalamus: case report. Neurosurgery. 2008 Feb;62(2):E530-2; discussion E532. doi: 10.1227/01.neu.0000316024.81786.78. PubMed PMID: 18382294.

203: Pallavaram S, Yu H, Spooner J, D'Haese PF, Bodenheimer B, Konrad PE, Dawant BM. Intersurgeon variability in the selection of anterior and posterior commissures and its potential effects on target localization. Stereotact Funct Neurosurg. 2008;86(2):113-9. doi: 10.1159/000116215. Epub 2008 Feb 13. PubMed PMID: 18270482; PubMed Central PMCID: PMC2719970.

204: Baker KB, Kopell BH, Malone D, Horenstein C, Lowe M, Phillips MD, Rezai AR. Deep brain stimulation for obsessive-compulsive disorder: using functional magnetic resonance imaging and electrophysiological techniques: technical case report. Neurosurgery. 2007 Nov;61(5 Suppl 2):E367-8; discussion E368. doi: 10.1227/01.neu.0000303995.66902.36. PubMed PMID: 18091226.

205: Toda H, Hamani C, Fawcett AP, Hutchison WD, Lozano AM. The regulation of adult rodent hippocampal neurogenesis by deep brain stimulation. J Neurosurg. 2008 Jan;108(1):132-8. doi: 10.3171/JNS/2008/108/01/0132. PubMed PMID: 18173322.

206: Halpern CH, Samadani U, Litt B, Jaggi JL, Baltuch GH. Deep brain stimulation for epilepsy. Neurotherapeutics. 2008 Jan;5(1):59-67. doi: 10.1016/j.nurt.2007.10.065. PubMed PMID: 18164484; PubMed Central PMCID: PMC2941772.

207: Hamani C, Hodaie M, Chiang J, del Campo M, Andrade DM, Sherman D, Mirski M, Mello LE, Lozano AM. Deep brain stimulation of the anterior nucleus of the thalamus: effects of Electrostimulation on pilocarpine-induced seizures and status epilepticus. Epilepsy Res. 2008 Feb;78(2-3):117-23. Epub 2007 Dec 20. PubMed PMID: 18083005.

208: Shields DC, Cheng ML, Flaherty AW, Gale JT, Eskandar EN. Microelectrode-guided deep brain

stimulation for Tourette syndrome: within-subject comparison of different stimulation sites. Stereotact Funct Neurosurg. 2008;86(2):87-91. Epub 2007 Dec 12. PubMed PMID: 18073521.

209: Shields DC, Sharma N, Gale JT, Eskandar EN. Pallidal stimulation for dystonia in pantothenate kinase-associated neurodegeneration. Pediatr Neurol. 2007 Dec;37(6):442-5. PubMed PMID: 18021929.

210: Jiménez F, Velasco F, Salín-Pascual R, Velasco M, Nicolini H, Velasco AL, Castro G. Neuromodulation of the inferior thalamic peduncle for major depression and obsessive compulsive disorder. Acta Neurochir Suppl. 2007;97(Pt 2):393-8. PubMed PMID: 17691327.

211: Samadani U, Baltuch GH. Anterior thalamic nucleus stimulation for epilepsy. Acta Neurochir Suppl. 2007;97(Pt 2):343-6. Review. PubMed PMID: 17691322.

212: Velasco F, Velasco AL, Velasco M, Jiménez F, Carrillo-Ruiz JD, Castro G. Deep brain stimulation for treatment of the epilepsies: the centromedian thalamic target. Acta Neurochir Suppl. 2007;97(Pt 2):337-42. PubMed PMID: 17691321.

213: Pollo C, Villemure JG. Rationale, mechanisms of efficacy, anatomical targets and future prospects of electrical deep brain stimulation for epilepsy. Acta Neurochir Suppl. 2007;97(Pt 2):311-20. Review. PubMed PMID: 17691317.

214: Kishima H, Saitoh Y, Osaki Y, Nishimura H, Kato A, Hatazawa J, Yoshimine T. Motor cortex stimulation in patients with deafferentation pain: activation of the posterior insula and thalamus. J Neurosurg. 2007 Jul;107(1):43-8. PubMed PMID: 17639872.

215: Salanova V, Worth R. Neurostimulators in epilepsy. Curr Neurol Neurosci Rep. 2007 Jul;7(4):315-9. Review. PubMed PMID: 17618538.

216: Bjartmarz H, Rehncrona S. Comparison of accuracy and precision between frame-based and frameless stereotactic navigation for deep brain stimulation electrode implantation. Stereotact Funct Neurosurg. 2007;85(5):235-42. Epub 2007 May 25. PubMed PMID: 17534136.

217: Pereira EA, Green AL, Bradley KM, Soper N, Moir L, Stein JF, Aziz TZ. Regional cerebral perfusion differences between periventricular grey, thalamic and dual target deep brain stimulation for chronic neuropathic pain. Stereotact Funct Neurosurg. 2007;85(4):175-83. Epub 2007 Mar 27. PubMed PMID: 17389817.

218: Lee KJ, Jang KS, Shon YM. Chronic deep brain stimulation of subthalamic and anterior thalamic nuclei for controlling refractory partial epilepsy. Acta Neurochir Suppl. 2006;99:87-91. PubMed PMID: 17370771.

219: Nishida N, Huang ZL, Mikuni N, Miura Y, Urade Y, Hashimoto N. Deep brain stimulation of the posterior hypothalamus activates the histaminergic system to exert antiepileptic effect in rat pentylenetetrazol model. Exp Neurol. 2007 May;205(1):132-44. Epub 2007 Jan 31. PubMed PMID: 17321522.

220: Lim SN, Lee ST, Tsai YT, Chen IA, Tu PH, Chen JL, Chang HW, Su YC, Wu T. Electrostimulation of the anterior nucleus of the thalamus for intractable epilepsy: a long-term follow-up study. Epilepsia. 2007 Feb;48(2):342-7. PubMed PMID: 17295629.

221: Lim DA, Khandhar SM, Heath S, Ostrem JL, Ringel N, Starr P. Multiple target deep brain stimulation for multiple sclerosis related and poststroke Holmes' tremor. Stereotact Funct Neurosurg. 2007;85(4):144-9. Epub 2007 Jan 26. PubMed PMID: 17259750.

222: Hodaie M, Cordella R, Lozano AM, Wennberg R, Dostrovsky JO. Bursting activity of neurons in the human anterior thalamic nucleus. Brain Res. 2006 Oct 18;1115(1):1-8. Epub 2006 Sep 8. PubMed PMID: 16962566.

223: Foote KD, Seignourel P, Fernandez HH, Romrell J, Whidden E, Jacobson C, Rodriguez RL, Okun MS. Dual electrode thalamic deep brain stimulation for the treatment of posttraumatic and multiple sclerosis tremor. Neurosurgery. 2006 Apr;58(4 Suppl 2):ONS-280-5; discussion ONS-285-6. PubMed PMID: 16582651.

224: Katayama Y, Kano T, Kobayashi K, Oshima H, Fukaya C, Yamamoto T. Difference in surgical strategies between thalamotomy and thalamic deep brain stimulation for tremor control. J Neurol. 2005 Oct;252 Suppl 4:IV17-IV22. Review. PubMed PMID: 16222433.

225: Nakano N, Uchiyama T, Okuda T, Kitano M, Taneda M. Successful long-term deep brain stimulation for hemichorea-hemiballism in a patient with diabetes. Case report. J Neurosurg. 2005 Jun;102(6):1137-41. PubMed PMID: 16028776.

226: Ziai WC, Sherman DL, Bhardwaj A, Zhang N, Keyl PM, Mirski MA. Target-specific catecholamine elevation induced by anticonvulsant thalamic deep brain stimulation. Epilepsia. 2005 Jun;46(6):878-88. PubMed PMID: 15946328.

227: Foote KD, Okun MS. Ventralis intermedius plus ventralis oralis anterior and posterior deep brain stimulation for posttraumatic Holmes tremor: two leads may be better than one: technical note. Neurosurgery. 2005 Apr;56(2 Suppl):E445; discussion E445. PubMed PMID: 15794849.

228: Simon SL, Douglas P, Baltuch GH, Jaggi JL. Error analysis of MRI and leksell stereotactic frame target localization in deep brain stimulation surgery. Stereotact Funct Neurosurg. 2005;83(1):1-5. Epub 2005 Feb 4. PubMed PMID: 15695925.

229: Yamamoto T, Katayama Y, Kano T, Kobayashi K, Oshima H, Fukaya C. Deep brain stimulation for the treatment of parkinsonian, essential, and poststroke tremor: a suitable stimulation method and changes in effective stimulation intensity. J Neurosurg. 2004 Aug;101(2):201-9. PubMed PMID: 15309909.

230: Vayssiere N, van der Gaag N, Cif L, Hemm S, Verdier R, Frerebeau P, Coubes P. Deep brain stimulation for dystonia confirming a somatotopic organization in the globus pallidus internus. J Neurosurg. 2004 Aug;101(2):181-8. PubMed PMID: 15309906.

231: Papavassiliou E, Rau G, Heath S, Abosch A, Barbaro NM, Larson PS, Lamborn K, Starr PA. Thalamic deep brain stimulation for essential tremor: relation of lead location to outcome. Neurosurgery. 2004 May;54(5):1120-29; discussion 1129-30. PubMed PMID: 15113466.

232: Gross RE, Jones EG, Dostrovsky JO, Bergeron C, Lang AE, Lozano AM. Histological analysis of the location of effective thalamic stimulation for tremor. Case report. J Neurosurg. 2004 Mar;100(3):547-52. PubMed PMID: 15035293.

233: Pollo C, Meuli R, Maeder P, Vingerhoets F, Ghika J, Villemure JG. Subthalamic nucleus deep brain stimulation for Parkinson's disease: magnetic resonance imaging targeting using visible anatomical landmarks. Stereotact Funct Neurosurg. 2003;80(1-4):76-81. PubMed PMID: 14745212.

234: Temel Y, Visser-Vandewalle V. Surgery in Tourette syndrome. Mov Disord. 2004 Jan;19(1):3-14. Review. PubMed PMID: 14743354.

235: Sturm V, Lenartz D, Koulousakis A, Treuer H, Herholz K, Klein JC, Klosterkötter J. The nucleus accumbens: a target for deep brain stimulation in obsessive-compulsive- and anxiety-disorders. J Chem Neuroanat. 2003 Dec;26(4):293-9. Review. PubMed PMID: 14729131.

236: Kiss ZH, Wilkinson M, Krcek J, Suchowersky O, Hu B, Murphy WF, Hobson D, Tasker RR. Is the target for thalamic deep brain stimulation the same as for thalamotomy? Mov Disord. 2003 Oct;18(10):1169-75. PubMed PMID: 14534922.

237: Pralong E, Debatisse D, Maeder M, Vingerhoets F, Ghika J, Villemure JG. Effect of deep brain stimulation of GPI on neuronal activity of the thalamic nucleus ventralis oralis in a dystonic patient. Neurophysiol Clin. 2003 Sep;33(4):169-73. PubMed PMID: 14519544.

238: Antonini A, Landi A, Benti R, Mariani C, De Notaris R, Marotta G, Pezzoli G, Gaini SM, Gerundini P. Functional neuroimaging (PET and SPECT) in the selection and assessment of patients with Parkinson's disease undergoing deep brain stimulation. J Neurosurg Sci. 2003 Mar;47(1):40-6. Review. PubMed PMID: 12900731.

239: Rosenow J, Das K, Rovit RL, Couldwell WT. Irving S. Cooper and his role in intracranial stimulation for movement disorders and epilepsy. Stereotact Funct Neurosurg. 2002;78(2):95-112. PubMed PMID: 12566835.

240: Nakajima T, Nimura T, Yamaguchi K, Ando T, Itoh M, Yoshimoto T, Shirane R. The impact of stereotactic pallidal surgery on the dopamine D2 receptor in Parkinson disease: a positron emission tomography study. J Neurosurg. 2003 Jan;98(1):57-63. PubMed PMID: 12546353.

241: Duffner F, Schiffbauer H, Breit S, Friese S, Freudenstein D. Relevance of image fusion for target point determination in functional neurosurgery. Acta Neurochir (Wien). 2002 May;144(5):445-51. PubMed PMID: 12111500.

242: Hodaie M, Wennberg RA, Dostrovsky JO, Lozano AM. Chronic anterior thalamus stimulation for intractable epilepsy. Epilepsia. 2002 Jun;43(6):603-8. PubMed PMID: 12060019.

243: Sterio D, Zonenshayn M, Mogilner AY, Rezai AR, Kiprovski K, Kelly PJ, Beric A. Neurophysiological refinement of subthalamic nucleus targeting. Neurosurgery. 2002 Jan;50(1):58-67; discussion 67-9. PubMed PMID: 11844235.

244: Ghika J, Villemure JG, Miklossy J, Temperli P, Pralong E, Christen-Zaech S, Pollo C, Maeder P, Bogousslavsky J, Vingerhoets F. Postanoxic generalized dystonia improved by bilateral Voa thalamic deep brain stimulation. Neurology. 2002 Jan 22;58(2):311-3. PubMed PMID: 11805266.

245: Zincone A, Landi A, Piolti R, Appollonio I, Mariani CB, Pezzoli G, Gaini SM, Frattola L. Physiologic study of the subthalamic volume. Neurol Sci. 2001 Feb;22(1):111-2. PubMed PMID: 11487185.

246: Yamamoto T, Katayama Y, Fukaya C, Kurihara J, Oshima H, Kasai M. Thalamotomy caused by cardioversion in a patient treated with deep brain stimulation. Stereotact Funct Neurosurg. 2000;74(2):73-82. PubMed PMID: 11251397.

247: Mobin F, De Salles AA, Behnke EJ, Frysinger R. Correlation between MRI-based stereotactic

thalamic deep brain stimulation electrode placement, macroelectrode stimulation and clinical response to tremor control. Stereotact Funct Neurosurg. 1999;72(2-4):225-32. PubMed PMID: 10853082.

248: Lenz FA, Jaeger CJ, Seike MS, Lin YC, Reich SG, DeLong MR, Vitek JL. Thalamic single neuron activity in patients with dystonia: dystonia-related activity and somatic sensory reorganization. J Neurophysiol. 1999 Nov;82(5):2372-92. PubMed PMID: 10561412.

249: Casey KL, Minoshima S, Morrow TJ, Koeppe RA. Comparison of human cerebral activation pattern during cutaneous warmth, heat pain, and deep cold pain. J Neurophysiol. 1996 Jul;76(1):571-81. PubMed PMID: 8836245.

250: Lenz FA, Dostrovsky JO, Tasker RR, Yamashiro K, Kwan HC, Murphy JT. Single-unit analysis of the human ventral thalamic nuclear group: somatosensory responses. J Neurophysiol. 1988 Feb;59(2):299-316. PubMed PMID: 3351564.

251: Cooper IS. Twenty-five years of experience with physiological neurosurgery. Neurosurgery. 1981 Aug;9(2):190-200. PubMed PMID: 6973705.

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Imbach LL, Baumann CR, Poryazova R, Geissler O, Brugger P, Sarnthein J, Mothersill I, Weller M, Oertel MF, Stieglitz LH. Anticonvulsive effect of anterior thalamic deep brain stimulation in super-refractory status epilepticus crucially depends on active stimulation zone-A single case observation. Seizure. 2019 Aug 28;71:286-288. doi: 10.1016/j.seizure.2019.08.015. [Epub ahead of print] PubMed PMID: 31493681.