

Epilepsy diagnosis

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The accurate diagnosis of seizures is essential as some patients will be misdiagnosed with [epilepsy](#), whereas others will receive an incorrect diagnosis. Indeed, errors in diagnosis are common, and many patients fail to receive the correct treatment, which often has severe consequences

Imaging

Imaging is pivotal in the evaluation and management of patients with seizure disorders.

[Positron emission tomography](#) (PET) is the most commonly performed interictal functional neuroimaging technique that may reveal a focal hypometabolic region concordant with seizure onset. [Single-photon emission computed tomography](#) (SPECT) studies may assist the performance of ictal neuroimaging in patients with pharmacoresistant focal epilepsy being considered for neurosurgical treatment ¹.

Magnetic resonance imaging

Elegant structural neuroimaging with [magnetic resonance imaging](#) (MRI) may assist in determining the etiology of focal epilepsy and demonstrating the anatomical changes associated with seizure activity. The high diagnostic yield of MRI to identify the common pathological findings in individuals with focal seizures including [mesial temporal sclerosis](#), vascular anomalies, [Low-grade glioma](#) and malformations of cortical development has been demonstrated.

Positron emission tomography in epilepsy

[Positron emission tomography](#) (PET) imaging in [epilepsy](#) is an in vivo technique that allows the localization of a possible [seizure onset zone](#) (SOZ) during the interictal period. Stereo-electro-encephalography (SEEG) is the gold standard to define the SOZ. The objective of aresearch was to evaluate the accuracy of PET imaging in localizing the site of SOZ compared with SEEG.

Seven patients with refractory temporal lobe epilepsy (Ep) and 2 healthy controls (HC) underwent 2 PET scans, one with 2-[18F]-fluoro-2-deoxy-D-glucose (FDG) and another with 2'-[18F]fluoroflumazenil (FFMZ), acquired 1 day apart. FDG was acquired for 10 min (static scan) 1 h after administration. An FFMZ scan was acquired for 60 min from radiopharmaceutical administration in a dynamic mode. Each brain PET image was segmented using a standard template implemented in PMOD 3.8. The pons was used as the reference region for modeling of the nondisplaceable binding potential (BPND) for FFMZ, and to obtain uptake ratios for FDG. SEEG studies of patients were performed as a part of their surgical evaluation to define the SOZ.

Well-defined differences between HC and Ep were found with both radiopharmaceuticals, showing the utility to identify abnormal brain regions using quantitative PET imaging. Lateralization of the SOZ findings by PET (lower uptake/binding in a specific brain hemisphere) matched in 86% for FFMZ and 71% for FDG with SEEG data.

Quantitative PET imaging is an excellent complementary tool that matches reasonably well with [SEEG](#) to define SOZ in presurgical evaluation ²⁾.

Cerebrospinal fluid analysis

[Cerebrospinal fluid analysis for epilepsy](#)

Automatic seizure detection

[Automatic seizure detection.](#)

Genetic testing

Results of a [cross-sectional](#) study suggest that [genetic testing](#) of individuals with [epilepsy](#) may be materially associated with clinical [decision-making](#) and improved patient [outcomes](#) ³⁾.

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Cendes F, Theodore WH, Brinkmann BH, Sulc V, Cascino GD. Neuroimaging of epilepsy. Handb Clin Neurol. 2016;136:985-1014. doi: 10.1016/B978-0-444-53486-6.00051-X. PubMed PMID: 27430454.

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Avendaño-Estrada A, Velasco F, Velasco AL, Cuellar-Herrera M, Saucedo-Alvarado PE, Marquez-Franco R, Rivera-Bravo B, Ávila-Rodríguez MA. Quantitative Analysis of [18F]FFMZ and [18F]FDG PET Studies in the Localization of Seizure Onset Zone in Drug-Resistant Temporal Lobe Epilepsy. Stereotact Funct Neurosurg. 2019 Nov 13:1-9. doi: 10.1159/000503692. [Epub ahead of print] PubMed PMID: 31722358.

³⁾

McKnight D, Morales A, Hatchell KE, Bristow SL, Bonkowsky JL, Perry MS, Berg AT, Borlot F, Esplin ED, Moretz C, Angione K, Ríos-Pohl L, Nussbaum RL, Aradhya S; ELEVIATE Consortium, Haldeman-Englert CR, Levy RJ, Parachuri VG, Lay-Son G, de Montellano DJD, Ramirez-Garcia MA, Benítez Alonso EO, Ziobro J, Chirita-Emandi A, Felix TM, Kulasa-Luke D, Megarbane A, Karkare S, Chagnon SL, Humberson JB, Assaf MJ, Silva S, Zarroli K, Boyarchuk O, Nelson GR, Palmquist R, Hammond KC, Hwang ST, Boutlier SB, Nolan M, Batley KY, Chavda D, Reyes-Silva CA, Miroshnikov O, Zuccarelli B, Amlie-Wolf L,

Wheless JW, Seinfeld S, Kanhangad M, Freeman JL, Monroy-Santoyo S, Rodriguez-Vazquez N, Ryan MM, Machie M, Guerra P, Hassan MJ, Candee MS, Bupp CP, Park KL, Muller E 2nd, Lupo P, Pedersen RC, Arain AM, Murphy A, Schatz K, Mu W, Kalika PM, Plaza L, Kellogg MA, Lora EG, Carson RP, Svystilnyk V, Venegas V, Luke RR, Jiang H, Stetsenko T, Dueñas-Roque MM, Trasmonte J, Burke RJ, Hurst ACE, Smith DM, Massingham LJ, Pisani L, Costin CE, Ostrander B, Filloux FM, Ananth AL, Mohamed IS, Nechai A, Dao JM, Fahey MC, Aliu E, Falchek S, Press CA, Treat L, Eschbach K, Starks A, Kammeyer R, Bear JJ, Jacobson M, Chernuha V, Meibos B, Wong K, Sweney MT, Espinoza AC, Van Orman CB, Weinstock A, Kumar A, Soler-Alfonso C, Nolan DA, Raza M, Rojas Carrion MD, Chari G, Marsh ED, Shiloh-Malawsky Y, Parikh S, Gonzalez-Giraldo E, Fulton S, Sogawa Y, Burns K, Malets M, Montiel Blanco JD, Habela CW, Wilson CA, Guzmán GG, Pavliuk M. Genetic Testing to Inform Epilepsy Treatment Management From an International Study of Clinical Practice. JAMA Neurol. 2022 Oct 31. doi: 10.1001/jamaneurol.2022.3651. Epub ahead of print. PMID: 36315135.

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