

**Seizures — Child  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
1. About Epilepsy. <i>Epilepsy and Seizure Statistics</i> . <a href="http://www.epilepsyfoundation.org/about/statistics.cfm">http://www.epilepsyfoundation.org/about/statistics.cfm</a> . Accessed 1 May 2012.	Review/Other-Dx	N/A	Estimates of the incidence and prevalence of seizures and epilepsy in the U.S.	N/A	4
2. Fisher RS, van Emde Boas W, Blume W, et al. Epileptic seizures and epilepsy: definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE). <i>Epilepsia</i> 2005; 46(4):470-472.	Review/Other-Dx	N/A	Review definitions for epileptic seizures and epilepsy.	According to the International League Against Epilepsy and the International Bureau for Epilepsy, epileptic seizure is a brief occurrence of signs and/or symptoms while epilepsy is characterized by an enduring tendency to generate epileptic seizures.	4
3. Weitemeyer L, Kellinghaus C, Weckesser M, et al. The prognostic value of [F]FDG-PET in nonrefractory partial epilepsy. <i>Epilepsia</i> 2005; 46(10):1654-1660.	Observational-Dx	90	To determine the value of FDG-PET in non-refractory partial epilepsy.	43/90 had regional asymmetry of tracer distribution. Not predictive of success of anticonvulsants. Regional hypometabolism in FDG-PET is not significantly associated with a lower likelihood of successful anticonvulsant drug therapy.	4
4. Baykan B, Ertas NK, Ertas M, Aktekin B, Saygi S, Gokyigit A. Comparison of classifications of seizures: a preliminary study with 28 participants and 48 seizures. <i>Epilepsy Behav</i> 2005; 6(4):607-612.	Review/Other-Dx	48 seizures; 28 reviewers	To compare three available seizure classifications: International classification of epileptic seizures (ICES), semiological seizure classification (SSC), and proposal of a new diagnostic scheme for seizures (PDSS).	Overall diagnostic success rates were 81.4% for ICES, 80.5% for PDSS, and 87.5% for SSC. In reliability analysis, Cronbach's alpha was 0.94 for ICES, 0.88 for PDSS, and 0.70 for SSC. 19 reviewers chose SSC, 8 chose ICES, and one chose PDSS as their preference.	4
5. Pellock JM. The classification of childhood seizures and epilepsy syndromes. <i>Neurol Clin</i> 1990; 8(3):619-632.	Review/Other-Dx	N/A	Review classification of childhood seizures and epilepsy syndromes.	Classification scheme helps in evaluation and treatment of patients.	4
6. Scheuer ML, Pedley TA. The evaluation and treatment of seizures. <i>N Engl J Med</i> 1990; 323(21):1468-1474.	Review/Other-Dx	N/A	To review diagnosis and treatment of seizures.	Electroencephalography is recommended for evaluating patients with known or suspected seizure disorder. MRI or x-ray CT can be combined with electrophysiologic studies, but MRI is more sensitive than CT in detecting cerebral lesions related to epilepsy.	4
7. Engel J, Jr. Report of the ILAE classification core group. <i>Epilepsia</i> 2006; 47(9):1558-1568.	Review/Other-Dx	N/A	To examine epileptic seizure types and epilepsy syndromes. Purpose of report is to identify research which will make possible the creation of a new classification.	No results.	4
8. Panayiotopoulos CP. Neonatal Epileptic Seizures and Syndromes. Available at: <a href="http://professionals.epilepsy.com/page/neonatal_seizures_and_syndromes.html">http://professionals.epilepsy.com/page/neonatal_seizures_and_syndromes.html</a> . Accessed 1 May 2012.	Review/Other-Dx	N/A	To review neonatal epileptic seizures and syndromes.	Epileptic syndromes that help in diagnosis and management of seizure disorders are a major advancement.	4

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9. Calciolari G, Perlman JM, Volpe JJ. Seizures in the neonatal intensive care unit of the 1980s. Types, Etiologies, Timing. <i>Clin Pediatr (Phila)</i> 1988; 27(3):119-123.	Review/Other-Dx	150	Retrospective review to determine distribution of clinical seizure types, etiologies, and timing of neonatal seizures.	Hypoxic-ischemic encephalopathy (65% of total) was most common. Seizures with hypoxic-ischemic encephalopathy occurred 90% in the first 2-days of life. 80% of all seizures in the first 2-days of life were related to hypoxic-ischemic encephalopathy.	4
10. Sheth RD. Neonatal Seizures. Available at: <a href="http://www.emedicine.com/neuro/topic240.htm">http://www.emedicine.com/neuro/topic240.htm</a> . Accessed 1 May 2012.	Review/Other-Dx	N/A	To review diagnosis, treatment and follow-up of neonatal seizures.	MRI is most sensitive for determining etiology for neonatal seizures. Cranial US is useful when determining whether intracranial hemorrhage (intraventricular hemorrhage) has occurred. Cranial CT is a more sensitive than US in detecting parenchymal abnormalities.	4
11. Glass HC, Bonifacio SL, Sullivan J, et al. Magnetic resonance imaging and ultrasound injury in preterm infants with seizures. <i>J Child Neurol</i> 2009; 24(9):1105-1111.	Observational-Dx	236 infants	To compare the incidence and type of brain abnormality detected by MRI and ultrasound in a large cohort of prematurely born neonates with seizures.	During the hospital course, 9 infants (3.8%) had clinical suspicion of seizures. Magnetic resonance imaging was abnormal in each case. Periventricular hemorrhagic infarct was more common in infants with seizures. Infants with seizures were more likely to have white matter injury, though the difference was not significant. Head ultrasound failed to detect the extent of brain abnormality in 8 (89%) of the infants. In this large cohort, infants with clinical suspicion of seizures had a high rate of MRI abnormalities that were not as well characterized by head ultrasound. Magnetic resonance imaging may be the study of choice for evaluating preterm infants with seizures.	3
12. Krishnamoorthy KS, Soman TB, Takeoka M, Schaefer PW. Diffusion-weighted imaging in neonatal cerebral infarction: clinical utility and follow-up. <i>J Child Neurol</i> 2000; 15(9):592-602.	Review/Other-Dx	8 neonates; 19 lesions	To describe the utility of echo-planar DWI in neonatal cerebral infarction.	DWI shows findings not evident on CT or routine MRI.	4

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13. Hsieh DT, Chang T, Tsuchida TN, et al. New-onset afebrile seizures in infants: role of neuroimaging. <i>Neurology</i> 2010; 74(2):150-156.	Observational-Dx	317 infants	To investigate the presenting characteristics of new-onset afebrile seizures in infants (age 1-24 months) and the yield of neuroimaging.	Half of the infants had partial features to their seizures, yet evidence for primary generalized seizures was rare. The majority had more than 1 seizure upon presentation. Seizures in this age group tended to be brief, with 44% lasting <1 minute. EEG abnormalities were found in half. One-third of CTs were abnormal, with 9% of all CTs requiring acute medical management. Over half of MRIs were abnormal, with cerebral dysgenesis being the most common abnormality (P<0.05). One-third of normal CTs had a subsequent abnormal MRI-only 1 resulted in altered medical management.	3
14. Hesdorffer DC, Chan S, Tian H, et al. Are MRI-detected brain abnormalities associated with febrile seizure type? <i>Epilepsia</i> 2008; 49(5):765-771.	Observational-Dx	159 children	To determine the frequency of MRI-detected brain abnormalities and to evaluate their association with febrile seizures type and with specific features of complex febrile seizures.	In 159 children with a first febrile seizure, imaging abnormalities occurred in 12.6% (n=20). 8/54 with complex febrile seizures had imaging abnormalities compared to 12/105 with simple febrile seizures. Compared to children with simple febrile seizures, children with both focal and prolonged febrile seizures (n=14) were more likely to have imaging abnormality (OR 4.3, 95% CI: 1.2-15.0), even after adjustment for abnormal neurological examination. Imaging abnormalities included those known to be associated with seizures (e.g., focal cortical dysplasia) and those not typically associated with seizures (e.g., subcortical focal hyperintensities $\geq 5$ mm).	2
15. DiMario FJ, Jr. Children presenting with complex febrile seizures do not routinely need computed tomography scanning in the emergency department. <i>Pediatrics</i> 2006; 117(2):528-530.	Review/Other-Dx	N/A	Examine imaging of children presenting with complex febrile seizures.	MRI is sensitive and clinically useful for most patients who are undergoing neurologic evaluation in the absence of suspected trauma or an immediate neurosurgical problem.	4

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16. Kimiwada T, Juhasz C, Makki M, et al. Hippocampal and thalamic diffusion abnormalities in children with temporal lobe epilepsy. <i>Epilepsia</i> 2006; 47(1):167-175.	Observational-Dx	14 patients; 14 control	To assess hippocampal and thalamic diffusion abnormalities in children with temporal lobe epilepsy. Fractional anisotropy and ADC values were compared with diffusion tensor imaging data of 14 controls (no epilepsy), as well as glucose PET findings.	Decreased fractional anisotropy ( $P < 0.001$ ) and increased ADC ( $P = 0.003$ ) values were found in the hippocampi ipsilateral to the seizure focus. Significant fractional anisotropy decreases ( $P = 0.002$ ) also were seen in the contralateral hippocampi, despite unilateral seizure onset and excellent surgical outcome in patients who underwent surgery. ADC values showed a trend for increase in the thalami ipsilateral to the epileptic focus in the seven children with secondarily generalized seizures ( $P = 0.09$ ). No group differences of ADC or fractional anisotropy were found in the lentiform nuclei. The diffusion tensor imaging variables did not correlate with regional glucose metabolism in any of the structures analyzed. Diffusion tensor imaging seems to be sensitive for detecting abnormalities in children with partial epilepsy, even in structures without apparent changes on conventional MRI.	3
17. Natsume J, Bernasconi N, Miyauchi M, et al. Hippocampal volumes and diffusion-weighted image findings in children with prolonged febrile seizures. <i>Acta Neurol Scand</i> 2007; 115(4 Suppl):25-28.	Observational-Dx	12 patients; 13 controls	To assess hippocampal volumes and DWI findings in children with prolonged febrile seizures.	Seizure duration ranged from 40 to 95 min. In 7/12 patients, seizures were refractory and lasted for 60 min or longer despite intravenous infusion of diazepam. In the patients with prolonged febrile seizures for 60 min or longer, hippocampal volumes were significantly larger than that of controls. In all patients, there was a positive correlation between hippocampal volumes and seizure duration. DWI showed hyperintensity in unilateral hippocampus in three patients with intractable seizures, ipsilateral thalamus in two, and cingulate in one. EEG showed abnormalities in temporal areas ipsilateral to the DWI abnormalities in these patients.	3
18. Provenzale JM, Barboriak DP, VanLandingham K, MacFall J, DeLong D, Lewis DV. Hippocampal MRI signal hyperintensity after febrile status epilepticus is predictive of subsequent mesial temporal sclerosis. <i>AJR</i> 2008; 190(4):976-983.	Observational-Dx	11 patients; 30 healthy children; 2 observers	Prospective blinded study to determine whether hippocampal MRI signal hyperintensity after febrile status epilepticus is predictive of subsequent mesial temporal sclerosis.	7 children had hyperintense signal intensity ranging from 1 (minimally increased) to 4 (markedly increased). MRI findings of a markedly hyperintense hippocampus in children with febrile status epilepticus was highly associated with mesial temporal sclerosis.	2

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19. Lee ST, Lui TN. Early seizures after mild closed head injury. <i>J Neurosurg</i> 1992; 76(3):435-439.	Review/Other-Dx	4,232	Review CT findings to determine incidence of seizure in patients with mild closed head injury.	100 patients (2.36%) had seizures within 1-week after head injury. Most of these seizures were the generalized tonic-clonic type. Early post-traumatic seizures after mild closed head injury have a high incidence (53%) in patients with normal CT findings.	4
20. Sharma S, Riviello JJ, Harper MB, Baskin MN. The role of emergent neuroimaging in children with new-onset afebrile seizures. <i>Pediatrics</i> 2003; 111(1):1-5.	Observational-Dx	500	Retrospective review to determine the frequency of clinically significant abnormal neuroimaging in children with new-onset afebrile seizures, and identify children at high-risk or low-risk for abnormal neuroimaging.	95% of patients (475/500) with new-onset afebrile seizures had neuroimaging. Clinically significant abnormal neuroimaging was noted in 8% (95% CI: 6, 11; 38/475) of patients. Recursive partition analysis identified 2 criteria associated with high risk for clinically significant abnormal neuroimaging: 1) the presence of a predisposing condition, and 2) focal seizure if <33 months old. Of the high-risk patients, 26% (95% CI: 17, 35; 32/121) had clinically significant abnormal neuroimaging compared with 2% (95% CI: 0.6, 3.7; 6/354) in the low-risk group.	3
21. Garvey MA, Gaillard WD, Rusin JA, et al. Emergency brain computed tomography in children with seizures: who is most likely to benefit? <i>J Pediatr</i> 1998; 133(5):664-669.	Observational-Dx	99	Retrospective review to determine if emergency brain CT in patients with new-onset seizures will benefit children.	19 children had brain abnormalities on CT. CT abnormalities requiring treatment or monitoring were more frequently seen in children with their first unprovoked seizure ( $P<.01$ ) and in those whose seizure onset had been focal or who had focal abnormalities identified on postictal neurologic examination ( $P<.04$ ).	3

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22. Jan M, Neville BG, Cox TC, Scott RC. Convulsive status epilepticus in children with intractable epilepsy is frequently focal in origin. <i>Can J Neurol Sci</i> 2002; 29(1):65-67.	Review/Other-Dx	18	A study on children with recurrent non-febrile convulsive status epilepticus to assess the evidence for focal origin. Clinical and radiological data was reviewed.	The patient's ages ranged between 6-22 years (mean 15.3, standard deviation 4), and 67% were males. Most children (89%) had a severe cognitive and/or behavioral disorder. Most patients (89%) had multiple seizure types and 95% of these were partial seizures. 12 (67%) children had at least one episode of convulsive status epilepticus with focal features identified clinically. Focal brain abnormalities were detected on 18% and 55% of CT and MRI films, respectively. Overall, 53% had a focal abnormality on structural neuroimaging. Interictal EEG revealed focal or multifocal abnormalities on at least one occasion in 94% and 22% of patients, respectively. Overall, 17 patients had focal features on at least one EEG. 13 ictal EEGs were recorded on 11 (61%) patients. 10 (91%) of these recordings revealed a focal onset.	4
23. Young AC, Costanzi JB, Mohr PD, Forbes WS. Is routine computerised axial tomography in epilepsy worth while? <i>Lancet</i> 1982; 2(8313):1446-1447.	Observational-Dx	220	To determine the value of routine CT of the brain in patients with epilepsy or isolated seizures.	CT was normal in 94% of patients without focal features. Only a quarter of the abnormalities on CT were potentially treatable by surgery, and only 10% of all the patients had their management changed as a result of CT.	4
24. Ibrahim K, Appleton R. Seizures as the presenting symptom of brain tumours in children. <i>Seizure</i> 2004; 13(2):108-112.	Observational-Dx	81	To retrospectively review frequency of brain tumors presenting with seizures.	In 10 (12%) of 81 children with brain tumor, seizures were the presenting clinical symptom.	4

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25. Maytal J, Krauss JM, Novak G, Nagelberg J, Patel M. The role of brain computed tomography in evaluating children with new onset of seizures in the emergency department. <i>Epilepsia</i> 2000; 41(8):950-954.	Observational-Dx	66	Retrospective chart review to determine the diagnostic utility of emergency brain CT in children who present to the emergency department with new onset of seizures.	66 patients, 34 boys and 32 girls with a mean age of 4.9 years, qualified for inclusion in the study. 52 patients (78.8%) had normal CT results and 14 patients (21.2%) had abnormal CT results. Seizure cause was considered cryptogenic in 33 patients, of whom 2 (6%) had abnormal CT results; neither patient required intervention. Seizure cause was considered symptomatic in 20 patients, of whom 12 (60%) had abnormal CT results (P<0.0001). In 2 patients with abnormal CT scans (both acute symptomatic), the imaging findings were of immediate therapeutic significance and were predictable from the clinical history and the physical examination. None of the 13 patients with complex febrile seizure cause had an abnormal CT scan. Patients with partial convulsive seizures were more likely to have abnormal CT scans than patients with generalized convulsive seizures, but the difference was not statistically significant.	4
26. Hart YM, Sander JW, Johnson AL, Shorvon SD. National General Practice Study of Epilepsy: recurrence after a first seizure. <i>Lancet</i> 1990; 336(8726):1271-1274.	Observational-Dx	564	2- to 4-year follow-up of patients with definite seizures.	67% (95% CI: 63%-71%) had a recurrence within 12 months of the first seizure, and 78% (74%-81%) had a recurrence within 36 months. Seizures associated with a neurological deficit (present at birth) had a high rate of recurrence (100% by 12 months), while seizures that occurred within 3 months of an acute insult to the brain, had a lower risk of recurrence (40% [29%-51%] by 12 months).	3
27. Hirtz DG. Generalized tonic-clonic and febrile seizures. <i>Pediatr Clin North Am</i> 1989; 36(2):365-382.	Review/Other-Dx	N/A	Review generalized and febrile seizures.	Relatively few children need daily anticonvulsant therapy.	4

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28. Reinus WR, Wippold FJ, 2nd, Erickson KK. Seizure patient selection for emergency computed tomography. <i>Ann Emerg Med</i> 1993; 22(8):1298-1303.	Observational-Dx	115 patients: 60-known seizure disorder; 38-new onset seizure; 17-possible seizure	To retrospectively evaluate the medical records of patients with seizures to determine the need for emergency CT.	Results of neurologic examination and CT were compared in 105 patients. Abnormal neurologic examination predicted 19/20 positive CT scans (95%) and demonstrated a strong association with CT results ( $P<.00004$ ). Only a history of malignancy correlated to CT findings ( $P<.008$ ). According to the results, the greatest benefit from emergency CT will be from patients with either a history of malignancy or an abnormal neurologic examination.	3
29. Itomi K, Okumura A, Negoro T, et al. Prognostic value of positron emission tomography in cryptogenic West syndrome. <i>Dev Med Child Neurol</i> 2002; 44(2):107-111.	Review/Other-Dx	17	To examine the prognostic value of PET in cryptogenic West syndrome.	Cortical hypometabolism was detected in 11 infants on the first PET and in 5 infants on the second. Rate of developmental delay at the last follow-up was significantly higher in infants with hypometabolism on the second PET than in those without PET abnormalities ( $P<.05$ ). Rate of seizure occurrence after initial treatment was higher in infants with cortical hypometabolism on the second PET, but the difference was not statistically significant.	4
30. Otsubo H, Chuang SH, Hwang PA, Gilday D, Hoffman HJ. Neuroimaging for investigation of seizures in children. <i>Pediatr Neurosurg</i> 1992; 18(2):105-116.	Review/Other-Dx	N/A	Review value of different imaging modalities in children with seizures.	A number of imaging modalities (CT, MRI, and Xenon CT, SPECT and PET) are being used for studying the abnormality in order to help plan surgery.	4
31. Lefkopoulos A, Haritanti A, Papadopoulou E, Karanikolas D, Fotiadis N, Dimitriadis AS. Magnetic resonance imaging in 120 patients with intractable partial seizures: a preoperative assessment. <i>Neuroradiology</i> 2005; 47(5):352-361.	Review/Other-Dx	120	To describe MRI findings in patients with intractable partial seizures and compare different MR sequences.	Coronal, thin images are most useful in the assessment of the hippocampus. Fluid-attenuated inversion recovery and inversion recovery are useful in the detection of lesions abutting cerebrospinal fluid spaces and developmental disorders, respectively, while T1 spin-echo sequences before and after the intravenous administration of gadolinium offer great facility in identifying space-occupying lesions and infections. MRI is the most important diagnostic tool for the assessment of epileptogenic foci.	4



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32. Wu WC, Huang CC, Chung HW, et al. Hippocampal alterations in children with temporal lobe epilepsy with or without a history of febrile convulsions: evaluations with MR volumetry and proton MR spectroscopy. <i>AJNR Am J Neuroradiol</i> 2005; 26(5):1270-1275.	Observational-Dx	55	To assess the hippocampal alterations in epileptic children with or without a history of febrile convulsions by using MR spectroscopy and volumetry.	Children with temporal lobe epilepsy and early history of febrile convulsion tend to have lower hippocampal volumes and NAA/(Cr + Cho) ratios than do temporal lobe epilepsy children without history of febrile convulsion. MR volumetry and spectroscopy are equally capable of showing the trends of hippocampal alterations in children with temporal lobe epilepsy with or without febrile history.	3
33. Avery RA, Zupal IG, Stokking R, et al. Decreased cerebral blood flow during seizures with ictal SPECT injections. <i>Epilepsy Res</i> 2000; 40(1):53-61.	Observational-Dx	21 patients; 3 observers	To determine if ictal SPECT injections reveal a change in regional cerebral blood flow around 100 s from seizure onset.	There was evidence that reduced regional cerebral blood flow may exist during ictus when ictal SPECT injections made 90 s after seizure onset were examined. The change in regional cerebral blood flow around 90 s is also observed in postictal injections, suggesting a common metabolic mechanism may be responsible.	3
34. Avery RA, Spencer SS, Spanaki MV, Corsi M, Seibyl JP, Zupal IG. Effect of injection time on postictal SPET perfusion changes in medically refractory epilepsy. <i>Eur J Nucl Med</i> 1999; 26(8):830-836.	Observational-Dx	27 patients receiving postictal and interictal SPECT scans	To examine effect of injection time on postictal SPECT perfusion changes in medically refractory epilepsy.	Most patients (8/12, 67%) receiving postictal injections within 100 s after seizure onset demonstrated hyperperfusion, while all patients (15/15, 100%) receiving postictal injections >100 after seizure onset showed hypoperfusion. Explanation of this phenomenon is unknown but findings appear to parallel known changes in cerebral lactate levels.	3
35. Weil S, Noachtar S, Arnold S, Yousry TA, Winkler PA, Tatsch K. Ictal ECD-SPECT differentiates between temporal and extratemporal epilepsy: confirmation by excellent postoperative seizure control. <i>Nucl Med Commun</i> 2001; 22(2):233-237.	Observational-Dx	30	To determine whether SPECT can separate temporal lobe from extra temporal lobe epilepsy.	Ictal SPECT showed isolated temporal hyperperfusion in 90% of temporal lobe patients and normal perfusion in 2 patients. Sensitivity of ictal ECD-SPECT for correct localization of the seizure onset zone was 80% in all patients, 86% in temporal lobe patients and 66% in extra temporal lobe patients. Ictal ECD-SPECT can be used to distinguish between temporal lobe and extra temporal lobe.	3

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36. Calcagni ML, Giordano A, Bruno I, et al. Ictal brain SPET during seizures pharmacologically provoked with pentylentetrazol: a new diagnostic procedure in drug-resistant epileptic patients. <i>Eur J Nucl Med Mol Imaging</i> 2002; 29(10):1298-1306.	Observational-Dx	33	To prove feasibility of pharmacologic induced seizures in ictal SPECT.	In 27/33 patients (82%), interictal-ictal SPECT showed the hypo-hyperperfusion SPECT pattern. Video-EEG showed a single epileptogenic zone in 21/33 patients (64%), and MRI showed anatomical lesions in 19/33 patients (57%). Ictal brain SPECT provides ictal images because (99m)-Tc-ECD is injected immediately upon seizure onset.	2
37. Mohan KK, Chugani DC, Chugani HT. Positron emission tomography in pediatric neurology. <i>Semin Pediatr Neurol</i> 1999; 6(2):111-119.	Review/Other-Dx	N/A	To review utility of PET in pediatric neurology.	In patients with intractable partial seizures, PET helps to localize focus for resection.	4
38. Juhasz C, Chugani DC, Padhye UN, et al. Evaluation with alpha-[11C]methyl-L-tryptophan positron emission tomography for reoperation after failed epilepsy surgery. <i>Epilepsia</i> 2004; 45(2):124-130.	Observational-Dx	33	To determine role of PET using alpha-[11C] methyl-L-tryptophan in detecting nonresected epileptic foci in patients with previously failed neocortical resection.	Alpha-[11C] methyl-L-tryptophan-PET can identify nonresected epileptic cortex and assist in planning reoperation.	3
39. Kalnin AJ, Fastenau PS, deGrauw TJ, et al. Magnetic resonance imaging findings in children with a first recognized seizure. <i>Pediatr Neurol</i> 2008; 39(6):404-414.	Review/Other-Dx	281 children	A large prospective study to characterize structural abnormalities associated with onset of seizures in children, using magnetic resonance imaging and a standardized classification system.	At least one MRI abnormality was identified in 87/281 (31%) children with a first recognized seizure. 2 or more abnormalities were identified in 34 (12%). The commonest abnormalities were ventricular enlargement (51%), leukomalacia/gliosis (23%), gray-matter lesions such as heterotopias and cortical dysplasia (12%), volume loss (12%), other white-matter lesions (9%), and encephalomalacia (6%). Abnormalities defined as significant, or potentially related to seizures, occurred in 40 (14%). Temporal lobe and hippocampal abnormalities were detected at a higher frequency than in previous studies (13/87). MRI and a standardized, reliable, valid scoring system demonstrated a higher rate of abnormal findings than previously reported, including findings formerly considered incidental. Practice parameters may need revision, to expand the definition of significant abnormalities and support wider use of MRI in children with newly diagnosed seizures.	4

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40. Singh RK, Stephens S, Berl MM, et al. Prospective study of new-onset seizures presenting as status epilepticus in childhood. <i>Neurology</i> 2010; 74(8):636-642.	Review/Other-Dx	1,382 patients	To characterize children with new-onset seizures presenting as status epilepticus at a tertiary care children's hospital.	A total of 144 patients presented in status epilepticus. The average age was 3.4 years. The majority of seizures (72%) lasted between 21 and 60 minutes. The majority of patients had no significant past medical history; one-fourth had a family history of epilepsy. Five (4%) patients with EEGs had electrographic seizures during the study, captured only with prolonged monitoring. The most common etiology was febrile convulsion, followed by cryptogenic. The most common acute symptomatic cause was central nervous system infection; the most common remote symptomatic cause was cerebral dysgenesis. Combined CT and MRI provided a diagnosis in 30%. CT was helpful in identifying acute vascular lesions and acute edema, whereas MRI was superior in identifying subtle abnormalities and remote symptomatic etiologies such as dysplasia and mesial temporal sclerosis.	4

## Evidence Table Key

### Study Quality Category Definitions

- *Category 1* The study is well-designed and accounts for common biases.
- *Category 2* The study is moderately well-designed and accounts for most common biases.
- *Category 3* There are important study design limitations.
- *Category 4* The study is not useful as primary evidence. The article may not be a clinical study or the study design is invalid, or conclusions are based on expert consensus. For example:
  - a) the study does not meet the criteria for or is not a hypothesis-based clinical study (e.g., a book chapter or case report or case series description);
  - b) the study may synthesize and draw conclusions about several studies such as a literature review article or book chapter but is not primary evidence;
  - c) the study is an expert opinion or consensus document.

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Dx = Diagnostic

Tx = Treatment

## Abbreviations Key

ADC = Apparent diffusion coefficient

CI = Confidence interval

CT = Computed tomography

DWI = Diffusion-weighted imaging

EEG = Electroencephalogram

FDG-PET = Fluorine-18-2-fluoro-2-deoxy-D-glucose-positron emission tomography

MRI = Magnetic resonance imaging

OR = Odds ratio

SPECT = Single-photon emission computed tomography