

Table 5 Recommendations: Diagnostic Evaluation

23. Recommendation: All epilepsy centers should have neuropsychologist(s) with training in neuropsychometric evaluation on site or by referral to perform or supervise clinical neuropsychological evaluations for patients manifesting or expressing neurocognitive symptoms or being evaluated for epilepsy surgery. CB Remark: The epilepsy center should have standard protocols that address which patients require neuropsychometric evaluations. CB Remark: Clinical neuropsychologists should be board certified or pursuing board certification. CB Remark: Centers with pediatric patients should have neuropsychologists with specific training and expertise in evaluating children. CB Remark: Individual tests should be performed by neuropsychologists, qualified psychometricians, or clinical staff with formal training in the administration of these tests. CB
24. Recommendation: All epilepsy centers should have CT and MRI with optimized epilepsy-specific MRI protocols. CB Remark: Centers that serve children should have the capability of performing studies, while the patient is under anesthesia with appropriate safety monitoring. CB
25. Recommendation: For centers that perform surgery, PET, SPECT, and/or MEG should be used when appropriate to increase the yield of presurgical localization of the seizure focus and assist in surgical decision-making. CB Remark: The multidisciplinary surgical planning team should make the decision regarding which specific imaging modality to use. CB Remark: Centers that perform surgery but do not have these imaging modalities should have the capability to arrange referrals for surgical patients. CB Remark: Centers that serve children should have the capability of performing studies while the patient is under anesthesia with appropriate safety monitoring. CB
26. Recommendation: For centers that perform surgery, fMRI, MEG, other functional mapping modalities, and/or Wada tests with cerebral angiography should be available to assist in localization of eloquent functions. CB Remark: Centers that perform surgery but do not have these imaging modalities should have the capability to arrange referrals for surgical patients as appropriate. CB
27. Recommendation: Centers that perform diagnostic imaging should have studies interpreted by personnel with appropriate specialty training and certification. CB Remark: Centers that serve children should have studies interpreted by neuroimaging specialists with specific training and expertise in pediatric studies. CB
28. Recommendation: All epilepsy centers should use genetic testing as part of the diagnostic workup for patients with intractable epilepsy of unknown etiology. CB Remark: Genetic testing is useful in evaluation of surgical candidates. CB Remark: Testing can be performed by an external laboratory. CB
29. Recommendation: All epilepsy centers should have an established protocol to identify those patients who would most likely benefit from genetic testing, even if their seizures are well controlled. CB Remark: Protocols should identify populations with a higher risk for genetic disorders, including early-onset epilepsy, developmental and epileptic encephalopathy, neurodevelopmental disabilities, and family history of epilepsy. CB
30. Recommendation: All epilepsy centers should offer genetic counseling from a certified genetic counselor either within the program or by referral. CB Remark: All pediatric centers should have access to medical genetics consultation on site or by referral. CB

Abbreviations: CB = consensus based; MEG = magnetoencephalography.

Additional noninvasive functional imaging capability is necessary in centers performing surgery. Although class I outcome data comparing different functional imaging methods are lacking, there is consensus that functional imaging, including PET, SPECT, and MEG—techniques that localize the regions of abnormal metabolism, blood flow, or electromagnetic activity, respectively—help identify epileptogenic brain regions.³⁸ Functional imaging—particularly fMRI and MEG—can also localize brain regions critical for language, movement, tactile sensation, hearing, and vision, providing landmarks to guide the surgeon.³⁸

The Wada test, the intracarotid administration of sedative to anesthetize 1 hemisphere, is also used to lateralize language and memory and is currently the only method that can assess the potential impact of surgery on memory. As Wada testing is more invasive and carries more risk than functional imaging, it should be used selectively when the benefit of assessing memory outweigh the risks of testing.^{11,29}

Because brain development and epilepsy syndromes differ uniquely in young children, pediatric epilepsy centers should have neuroradiologists with training and expertise in

interpreting pediatric studies. Moreover, the behavioral needs of children require that pediatric centers follow pediatric safety measures, including pediatric anesthesia, if necessary.

Genetic Services

Genetic testing has an increasingly important role in the diagnostic evaluation of epilepsy demonstrating utility in children³⁹ and adults.^{40,41} Testing results may provide insight into mechanisms or prognosis that influence surgical³⁹ decision-making and inform medical management.^{39,41} Because a genetic diagnosis may lead to more effective management and better outcome, testing should occur early in diagnostic evaluation.⁴¹

No consensus exists currently on the optimal genetic testing strategy. Diagnostic yield, age at testing, and cost-effectiveness all influence test choice. Diagnostic yield of genetic tests is higher with DRE,⁴⁰ earlier seizure onset age,^{40,41} and sub-populations such as individuals with developmental epileptic encephalopathy or neurodevelopmental disabilities.⁴⁰ Centers implementing a consistent testing strategy that reflects these factors are more likely to benefit patients than those lacking testing protocols.⁴¹