

American Clinical Magnetoencephalography Society Clinical Practice Guideline 4: Qualifications of MEG–EEG Personnel*

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This Clinical Practice Guideline pertains to currently approved, reimbursable, clinical indications for magnetoencephalography (MEG), namely, localization of epileptic foci in surgical candidates with medically refractory epilepsy and functional mapping of eloquent cortices in preparation for surgery of various operable lesions. As new applications are clinically validated and established, the guidelines will be revised as needed.

QUALIFICATIONS OF MEG–EEG PERSONNEL

Minimal Qualifications for Physicians Interpreting Clinical Magnetoencephalography and MEG–EEG Studies

During the pioneering days of clinical MEG, many highly competent professionals of different background propelled the field, advanced clinically with it through different experiences, and currently interpret clinical MEGs within the team while not individually meeting the requirements listed below. A new phase of clinical MEG requires uniform educational standards proposed for individuals entering the clinical MEG field after 2010.

1. A doctoral-level professional interpreting clinical MEG and/or MEG–EEG studies should be a physician preferably with board eligibility or certification in neurology, pediatric neurology, or neurosurgery. Physicians from other specialties need to obtain additional exposure to clinical neurophysiology equivalent to the requirements for board

certification in this subspecialty (see point 2). All physicians interpreting clinical MEG and MEG–EEG studies need to acquire expertise specifically in MEG through additional supervised training (see point 3) and have an appropriate license for the practice of medicine.

2. Additional background training of physicians interpreting clinical MEG and MEG–EEG studies should meet the minimal requirements for examination by the American Board of Clinical Neurophysiology (www.abcn.org) or the American Board of Psychiatry and Neurology Added Qualifications in Clinical Neurophysiology (www.abpn.com).
3. Specific MEG training should also include supervised learning of and practice in clinical MEG recording, reviewing, and source analysis of clinical MEG for at least 6 months and the independent interpretation and reporting of at least 50 MEG studies of epilepsy and 25 MEG studies of evoked fields (auditory, visual, somatosensory, motor, and language). The majority of epilepsy studies should be abnormal and include a mixture of clinical findings.

Minimal Qualifications of Magnetoneurodiagnostic Technologists

1. The background qualifications of magnetoneurodiagnostic technologists shall preferably be those set forth for electro-neurodiagnostic technologists by the American Clinical Neurophysiology Society and allied organizations. Registries in electroencephalographic or evoked potential technology (REEGT and REPT), administered by the American Board of Registration of Electroneurodiagnostic Technologists (www.abret.org), are preferred for MEG technologists. Technologists of related disciplines need to acquire additional exposure to and training in clinical neurophysiology.
2. At least 6 months of supervised clinical experience in an active MEG center, following formal training, is suggested to record MEG–EEG in an unsupervised capacity.
3. A minimum of 3 of the 6 months should include additional supervised training in the principles of MEG technology, technical aspects of MEG systems with competency in operational routines, including helium filling, tuning procedures (as applicable), standard testing procedures, trouble shooting, artifact prevention and elimination, data storage, and sufficient understanding of source localization to preprocess routine clinical data for the analysis by a physician magnetoencephalographer.

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Laboratory (Center) Organization and Reporting of Studies

1. The laboratory (center) director shall have the primary responsibility for the overall operations and policies of the laboratory (center). These policies should be documented in written form in a policy and procedures manual. Under the supervision of the MEG laboratory (center) director, the chief MEG technologist shall be responsible for the daily operation of the laboratory (center). The chief technologist or a designated technologist, together with the laboratory (center) director, shall ensure that the highest standards of MEG–EEG technical practice are maintained.
2. All clinical MEG and MEG–EEG studies should be analyzed, interpreted, and signed by a qualified physician magnetoencephalographer, and co-signatures by an unqualified physician are considered inadequate on clinical reports.
3. The processing and analysis of magnetoencephalograms requires considerable time and skill to complete satisfactorily. In most centers, nonphysician MEG scientists with a doctoral degree in biological sciences and neurophysiological training are expected to help with the processing of MEG data. Technologists, neurologists in training, and physicians from other disciplines with appropriate backgrounds in clinical neurophysiology and MEG also help with the processing of MEG data in most centers. While the assistance of such personnel is critical to the operation of a MEG laboratory (center), only

physician magnetoencephalographers should have the primary responsibility for clinical interpretation of MEG–EEGs.

4. Records should be maintained in an orderly manner and stored according to an established EEG practice.

REFERENCES

- American Clinical Neurophysiology Society (ACNS). Guideline 1: minimum technical requirements for performing clinical electroencephalography. 2006. <http://www.acns.org/pdfs/Guideline%201.pdf>. Accessed April 17, 2011.
- American Clinical Neurophysiology Society (ACNS). Guideline 2: minimum technical standards for pediatric electroencephalography. 2006. <http://www.acns.org/pdfs/Guideline%202.pdf>. Accessed April 17, 2011.
- American Clinical Neurophysiology Society (ACNS). Guideline 4: Standards of practice in clinical electroencephalography. 2006. <http://www.acns.org/pdfs/Guideline%2041.pdf>. Accessed April 17, 2011.
- American Clinical Neurophysiology Society (ACNS). Guideline 7: guidelines for writing EEG reports. 2006. <http://www.acns.org/pdfs/ACFDD50.pdf>. Accessed April 17, 2011.
- American Clinical Neurophysiology Society (ACNS). Guideline 8: guidelines for recording clinical EEG on digital media. 2006. <http://www.acns.org/pdfs/Guideline%208.pdf>. Accessed April 17, 2011.
- American Clinical Neurophysiology Society (ACNS). Technical standard 1: standard for transferring digital neurophysiological data between independent computer systems. 2008. http://www.acns.org/pdfs/3.03_acns-ts1_2008-0306.pdf. Accessed April 17, 2011.
- The CPT 2011 professional edition. 2010. AMA ;494.
- American Medical Association Policy Compendium, H-35.971, Diagnosis of Disease and Diagnostic Interpretation of Tests Constitutes Practice of Medicine to be Performed by or Under the Supervision of Licensed Physicians. Resolution 904, Interim-2006.