

# American Clinical Neurophysiology Society: EEG Guidelines Introduction

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**Summary:** This revision to the EEG Guidelines is an update incorporating current EEG technology and practice. "Standards of practice in clinical electroencephalography" (previously Guideline 4) has been removed. It is currently undergoing revision through collaboration among multiple medical societies and will become part of "Qualifications and Responsibilities of Personnel Performing and Interpreting Clinical Neurophysiology

Procedures." The remaining guidelines are reordered and renumbered.

**Key Words:** EEG, Guideline, EEG equipment, EEG electrode, EEG montage, EEG brain death, EEG report, Adult, Pediatric, Neonatal.

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## Guideline 1: Minimum Technical Requirements for Performing Clinical EEG

Digital equipment has many advantages over analog equipment and is now used for EEG in most facilities. Some recommendations in this guideline have changed to reflect the greater functionality of digital equipment, including the ability to record good quality signal with nontraditional electrodes and slightly higher impedances. The list of basic patient information has been expanded to include more factors that can influence the EEG. The sections on calibration, sensitivity, filters, and recording montages have been updated to maintain relevance for digital systems. Newly added sections include those discussing the utility of longer recordings, sleep deprivation, and simultaneous video recording. Other new sections include material on photic stimulation procedure, interpreting physician notification of critical EEG results, and data storage.

## Guideline 2: Guidelines for Standard Electrode Position Nomenclature

This was previously published as Guideline 5. Although the 10-10 system of electrode position nomenclature has been accepted internationally for almost two decades, it has not been used universally. The reasons for this and clinical scenarios when the 10-10 system provides additional localizing information are discussed in this revision. In addition, section IV elaborates on situations in which AF1/2, AF5/6, PO1/2, and PO5/6 electrode positions may be used for EEG recording.

## Guideline 3: A Proposal for Standard Montages to be Used in Clinical EEG

This was previously published as Guideline 6. A discussion of methodology for the appropriate selection of reference electrodes is added. In addition, montages are added to assist with localization of abnormal activity in mesial frontal and anterior temporal regions.

## Guideline 4: Recording Clinical EEG on Digital Media

This was previously published as Guideline 8. Recording parameters have been updated to reflect the higher level of resolution provided by current technology. Also, types of storage devices have changed since the earlier version of this guideline, and recommendations are made for digital storage to ensure durability and Health Insurance Portability and Accountability Act compliant accessibility as computer technology continues to evolve. Finally, details on the minimum computer screen display resolution have been updated.

## Guideline 5: Minimum Technical Standards for Pediatric EEG

This was previously published as Guideline 2, and, similar to the previous guideline, delineates aspects of Guideline 1 that

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should be modified for neonates and young children. Recording conditions for photic stimulation and hyperventilation were revised to enhance provocation of epileptiform discharges. Changes were also made to recognize the difficulties involved in performing an EEG under sedation in young children. Recommended neonatal EEG montages are displayed for the reduced set of electrodes only since the montages in Guideline 3 should be used for a 21 electrode 10-20 system array. Neonatal documentation has also been updated to use current American Academy of Pediatrics term “postmenstrual age” rather than “conceptual age.” Finally, because therapeutic hypothermia alters the prognostic value of neonatal EEG, it is necessary to document the patient’s temperature at the time of recording.

### **Guideline 6: Minimum Technical Standards for EEG Recording in Suspected Cerebral Death**

This was previously published as Guideline 3. This update takes into account more recent publications on brain death criteria and artifacts. With modern technology, grounding from other electrical equipment is no longer a concern, and Guideline 1 recommendations to use a ground electrode should be followed. The 10-10 system electrode positions can be used when equivalent to the recommended 10-20 system locations. Sensitivity settings now reflect digital recording technology. Simultaneous video recording has become available widely and

is recommended as a helpful adjunct in cerebral death recordings. A new section specifies factors that can lead to an inaccurate determination of cerebral death.

### **Guideline 7: Guidelines for Writing EEG Reports**

This is a revision of the previous Guideline 7 “Writing an EEG Report” and is intended to provide an update for routine EEG reporting. The goal is not only to convey clinically relevant information but also to improve interrater reliability by standardizing the format of EEG reports. With this goal in mind, there is expanded documentation of the patient history to include more relevant clinical information that can affect the EEG recording and interpretation. Recommendations for the technical conditions of the recording are also enhanced to include post hoc review parameters and type of EEG recording. Sleep feature documentation is also expanded upon. More descriptive terms are included for background features and interictal discharges that are concordant with recent efforts to standardize terminology. In the clinical correlation section, examples of common clinical scenarios are provided to encourage uniform reporting. Including digital samples of abnormal waveforms is now possible and beneficial in augmenting reports when controversial waveforms or important features are encountered.