

ELECTROENCEPHALOGRAPH (EEG) CUP ELECTRODE APPLICATION: A MULTICENTER PROSPECTIVE STUDY

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David Hoffman MSPH¹, MBA, Ian Haislip MPH¹, Christina Cool MPH¹
¹Ambu USA, Columbia, MD, USA

BACKGROUND

Given the evolution of technology and the rising pressures in healthcare facilities, understanding the requirements of EEG cup electrode application has become essential for neurodiagnostic departments. Limited research currently exists on the required time and staffing to properly execute EEG cup electrode application. To correctly hook up and monitor a patient, an EEG tech must carefully carry out steps such as:

- Collect Materials
- Supply and Patient Preparation
- Electrode Application and Securing
- Wire Management

The purpose of this study was to understand the time required to properly apply and remove EEG cup electrodes and investigate potential (in)efficiencies.

METHODS

EEG cup electrode applications were followed at 3 university hospitals in the United States from July 2023 to February 2024.

Time increments were captured for:

- Electrode preparation
- Transportation to and from the patient
- Placement
- Setup
- Head wrapping, when applicable
- Removal
- Delays, when applicable

RESULTS

The average electrode application (preparation, transport to and from patient, placement, wrapping, and setup) and removal (transport to and from patient and removal) times were found to be 36:33 (n=25) and 8:40 (n=10), respectively.

The active time required for each step can be found in Table 1.



Table 1. Active Time Required for Electrode Placement and Removal

Step	Average Time (mm:ss)	N
Setup		
Preparation	02:01	11
Transport to Patient	03:20	25
Delays	06:34	6
Electrode Placement	23:55	25
Computer Setup	04:32	14
Placement and Setup	26:28	25
Head Wrapping	04:43	12
Walk Back	03:17	24
Setup Time (Average)*	36:33	25
Removal		
Transport to Removal	02:08	5
Removal	05:18	10
Transport Back	03:49	6
Removal (Average)*	08:40	10
*Average for each case and may not include each step listed		

DISCUSSION

The results of this study are lower than literature which found the average time to properly apply EEG electrodes to be 50:18.¹ Given the variability in steps and time to apply EEG electrodes, further research should be performed as efficiencies in the hospital become more critical for patient care.

This study does not capture the time required to reapply electrodes that were removed either by the patient or for a procedure. Further research should be performed to capture the frequency of electrode reapplication per patient.

CONCLUSION

The average electrode application and removal times were found to be 36:33 (n=25) and 8:40 (n=10), respectively. Further research should be performed to better understand what improvements in efficiency can be made in EEG cup electrode application and removal.

1. Hoffman D, Haislip I, Cool C. Estimated time to properly apply electroencephalogram (EEG) electrodes: A survey (P11-1.009). Neurology. 2024;102(17_supplement_1). doi:10.1212/wnl.0000000000206322