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The Cost of After-Hour Electroencephalography

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Abstract

Background and Objectives

High costs associated with after-hour electroencephalography (EEG) constitute a barrier for financially constrained hospitals to provide this neurodiagnostic procedure outside regular working hours. Our study aims to deepen our understanding of the cost elements involved in delivering EEG services during after-hours.

Methods

We accessed publicly available data sets and created a cost model depending on 3 most commonly seen staffing scenarios: (1) technologist on-site, (2) technologist on-call from home, and (3) a hybrid of the two.

Results

Cost of EEG depends on the volume of testing and the staffing plan. Within the various cost elements, labor cost of EEG technologists is the predominant expenditure, which varies across geographic regions and urban areas.

Discussion

We provide a model to explain why access to EEGs during after-hours has a substantial expense. This model provides a cost calculator tool (made available as part of this publication in eAppendix 1, links.lww.com/CPJ/A513) to estimate the cost of EEG platform based on site-specific staffing scenarios and annual volume.

Introduction

Electroencephalography (EEG) is not widely available across hospitals after regular working hours.[1-3] EEG is the only reliable means of diagnosis of nonconvulsive status epilepticus,[4] and timely access to emergent EEG for inpatients is associated with improved mortality,[5] greater confidence in physician care decisions,[2] and reduced interhospital transfers.[6,7] One of the main reasons for deficient access to after-hour EEG diagnostics is the financial cost of the EEG that prohibits hospitals with limited means from adopting a 24/7 EEG infrastructure. Important studies have highlighted the high cost of inpatient conventional EEG.[8,9] However, to our knowledge, no model exists to help estimate the annual cost of after-hour EEG depending on the predicted annual number of procedures and whether after-hour EEGs are performed by an in-house EEG technologist by an on-call from-home EEG technologist or a hybrid of the two. This study was designed to fill this gap of information by gaining a systematic understanding of the cost of providing conventional EEG during after-hours given these scenarios.

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Methods

Overview and Cost Equations

Annual costs (C_{ann}) for the 3 scenarios were the sum of labor costs, equipment costs, and space costs required to provide after-hour services for 1 year (t_{ann}). Our model includes the fixed costs of in-house hourly wages (w) for full-time equivalent (t_{fte}) technologists(n_{fte}), nondisposable equipment costs(c_{nde}), and annual costs for space in a hospital for both the EEG machine (c_{speeg}) and the in-house technologist (c_{space}). Variable costs varied based on annual EEG demand (n_{eeg}) and the time from ordering to completion of EEG (t_{eeg}), including travel time to/from home, as well as disposable equipment costs (c_{de}). Wages are modified by benefit rate (r_b) for full-time equivalent in-house technologists, the overtime rate for in-house services (r_{ot}), and home call rate (r_{hc}). We do not include the costs for professional EEG interpretation in the model.

In scenario 1, all costs are fixed with the exception of disposable equipment costs, and all services are in-house by 3 nonoverlapping technologists.

$$C_{ann} = wr_b t_{fte} n_{fte} + wr_{ot}\left(t_{ann} - t_{fte} n_{fte}\right) + c_{nde} + c_{speeg} + c_{sptech} + c_{de} n_{eeg} \quad (1)$$

In scenario 2, salaried EEG technologists cover all after-hour EEG from home at a home call rate that is a fraction of their regular salary, with in-house overtime rate applied only for the time when EEG is required. There are no technologist space costs (although space for housing the EEG machine is included) in this scenario.

$$C_{ann} = wr_{hc}\left(t_{ann} - n_{eeg} t_{eeg}\right) + wr_{ot} n_{eeg} t_{eeg} + c_{nde} + c_{speeg} + c_{de} n_{eeg} \quad (2)$$

In scenario 3, one dedicated technologist provides full-time equivalent in-house EEG services similar to scenario 1, with the remainder of after-hour EEG covered by home call as in scenario 2. The proportion of EEG demand covered by in-house is equivalent to the proportion of hours covered by the in-house technologist $\left(\frac{t_{fte} n_{fte}}{t_{ann}}\right)$.

$$C_{ann} = wr_b t_{fte} n_{fte} + wr_{hc}\left(t_{ann} - t_{fte} n_{fte} - n_{eeg} t_{eeg} \frac{t_{ann} - t_{fte} n_{fte}}{t_{ann}}\right) + wr_{ot} n_{eeg} t_{eeg} \frac{t_{ann} - t_{fte} n_{fte}}{t_{ann}} + c_{de} n_{eeg} + c_{nde} + c_{speeg} + c_{sptech} \quad (3)$$

We develop base cases for all 3 staffing scenarios.

Model Parameter Sources

We used the results of the American Society of Electrodiagnostic Technologists (ASET) Neurodiagnostic Profession Salary and Benefits Report,[10] a survey of 2,530 neurodiagnostic technologists reporting salary data, overtime rates, annual afterhours EEG volume (taken as half of reported mean survey-reported inpatient EEG cases), and time allotted for EEG. Equipment costs were based on the practice expense costs for CPT 95819 (EEG, awake, and asleep) for relative value unit determination by CMS[11] as the sum of disposable supplies and durable equipment (inclusive of 1-year depreciation). Space costs were obtained from the General Services Administration pay rates for leased hospital space,[12] per square foot (Table 1). All costs were adjusted to more recent US Dollar values using the Consumer Price Index for Medical Care from the Bureau of Labor Statistics.[13]

Model Assumptions

Our model is based on 5 assumptions: (1) all after-hours time is covered by regular full-time technologists, in-house overtime, or home call paid at an overtime rate; (2) in-house technologists would not overlap in times covered; (3) EEG technologists would only be hired up to but not exceeding the annual total after-hours coverage requirement (through 1.0 FTE hours) with any remainder covered through overtime; (4) the time per week covered would be the same for all 52 weeks, comprising 80 hours on weekdays and 48 hours on weekends; and (5) for inpatient 1.0 FTE technologists in scenarios 1 and 3, salaries would be identical with similar benefits including paid time off.

Table 1 Model Parameters

Category	Parameter	Cost equation Variable	Base case value
Labor[a]	Salary	w	$72,480.73
	Weeks/yr	t_{fte}	50
	Benefits rate	r_b	1.3
	Full-time hours/week	t_{fte}	40
	OT rate	r_{ot}	1.5
	Home call rate	r_{hc}	0.1
Equipment+	Nondisposable equipment costs	c_{nde}	$9,181.15
Supplies[b]	Disposable supplies costs	c_{de}	$34.13
	Electrode costs	c_{de}	$31.50
Space[c]	On-call space costs	c_{sptech}	$4,214.98
	EEG space costs	c_{speeg}	$309.54
Time variables	Annual after-hours	t_{ann}	6,656 h
	Time to EEG completion[d]	t_{eeg}	2 h
EEG demand	After-hour EEG/year[a]	n_{eeg}	425

Cost equation variable column indicates parameter contributed (directly or was used to calculate) to cost equation variable. All costs inflated to 2020 US Dollars using the Consumer Price Index for Medical Care.[13]
[a] From 2018 ASET Neurodiagnostic Professions Salary and Benefits Report.[10]
[b] From CMS 98519 Practice Expense delineated expenditures including 1-y depreciation costs for nondisposable equipment.[11]
[c] General Services Administration 2019 Hospital Lease costs, per square foot (8′ × 10′ on-call space, 3′ × 3′ for EEG space).[12]
[d] Sum of total time for inpatient EEG reported in ASET Neurodiagnostic time + technologist commute time from Bureau of Labor Statistics).[26]

Reporting

We report the total and per-EEG annual costs for each scenario, with subcategories of labor, equipment, and space costs. We examined a one-way sensitivity analysis of varying annual EEG demand for each of the scenarios described above. All models and statistical analysis were created using Microsoft Excel 365 (Microsoft Corp, Redmond, WA) and Stata 16.0 (StataCorp, College Park, TX.)

Data Availability

Data will be publicly available. We will also make the equations and formulas available for public use.

Results

For the base case demand of 425 after-hour EEGs, total and per EEG were the highest for scenario 1(technologists in-house), with costs 2.8 times greater than scenario 2 (home call) and 1.8 times greater than scenario 3 (hybrid labor was the largest cost driver in each scenario (88% of scenario 1 costs, 70% of scenario 2 costs, 78% of scenario 3), followed by equipment (11%–30% of totals) and space(<1% of total cost in all scenarios) (Table 2).

In one-way sensitivity analysis of EEG demand, costs converged at demand of 2,000 EEGs per year in all 3 scenarios. Varying EEG demand at ±50% of the base case value demonstrated the markedly high cost per EEG at lower demands in scenario 1 (quadruple the costs of scenario 2 for 200 EEGs/year), dropping precipitously to just over twice the per-EEG cost at a demand of 675 EEGs/year (Figure).

Discussion

Our study provides a micro-costing model to explain why access to EEGs during after-hours has a substantial expense and why in-house technologists providing after-hour EEG, providing EEG services without out of hospital drive time, is the costliest alternative. Among the cost centers, labor is by far the largest expenditure, and although we use a national mean salary for registered EEG technologists to estimate labor costs, this parameter may be even greater in some geographic regions and urban areas.[10] We demonstrate that the needs for after-hour EEG can be fulfilled as in-house or home-call programs, but implications for timeliness of EEG also need to be considered.

To offset cost, in-house after-hour technologists are often asked to perform other neurophysiologic tasks, including monitoring multiple patients in the EMU for long-term monitoring, at the cost of delayed access to EEG because the technologists attempt to juggle their other duties. In keeping with this, 5 large hospitals in the United States with several dedicated EEG technologists in-house during after-hours (i.e., scenario 1 with more than one EEG technologist) reported a median time of 4 hours to EEG.[2] In a survey of US EEG laboratory medical directors,[1] the mean time to completion and preliminary interpretation of EEG from ordering was estimated to be more than 3 hours.

Given the high cost of after-hour EEG, some hospitals with limited resources decide to offer no EEGs at all during after-hours. More than ¾ of hospital operation time is during after-hours; this option has the lowest up-front cost. Eighty percent of surveyed US EEG laboratory medical directors indicated their institution has at least some capability of performing emergent EEG after-hours,[1] but most were at academic medical centers. Respondents without 24/7 EEG services cited lack of technologist support and insufficient reimbursement as the major impediments to providing after-hour inpatient EEG. Similarly, technologist coverage has been identified as among the primary obstacles to

Table 2 Base Case Results for Annual Demand of 425 After-Hour Inpatient EEGs

	Scenario 1–in-house only		Scenario 2–home call only		Scenario 3–in-house + home call hybrid	
	Total	Per EEG	Total	Per EEG	Total	Per EEG
Costs						
Labor	$306,091.70	$720.22	$85,394.84	$200.93	$150,336.25	$353.73
Equipment	$37,073.90	$87.23	$37,073.90	$87.23	$37,073.90	$87.23
Space	$4,524.51	$10.65	$309.54	$0.73	$4,524.51	$10.65
Total	$347,690.11	$818.09	$122,778.28	$288.89	$191,934.66	$451.61
Hours worked						
Regular FTE	6,000 h		0 h		2000 h	
OT in-house[a]	656 h		1,275 h		892 h	
Home call	0 h		5,381 h		3,764 h	

Abbreviations: FTE = full-time equivalent; OT = overtime.
For each scenario, depicts total and per EEG labor hours.
[a] Includes all time spent in hospital in home call scenarios.

providing emergency EEG.[14] Moreover, only 27.3% of US hospitals in 2018 had any EEG capability (during work hours or after-hours).[6] However, lack of EEG availability may lead to delayed detection of nonconvulsive status epilepticus (NCSE), which can only be detected with EEG. Failure to identify these seizures in time can lead to undertreatment of patients who continue to seize without abortive antiseizure medications, which may lead to ultimately more difficult (and expensive) to treat seizures, and potentially deleterious effects on patient morbidity, mortality, and long-term outcome for cognitive disability, overall neurologic function, and development of chronic epilepsy.[4,5,15-21]

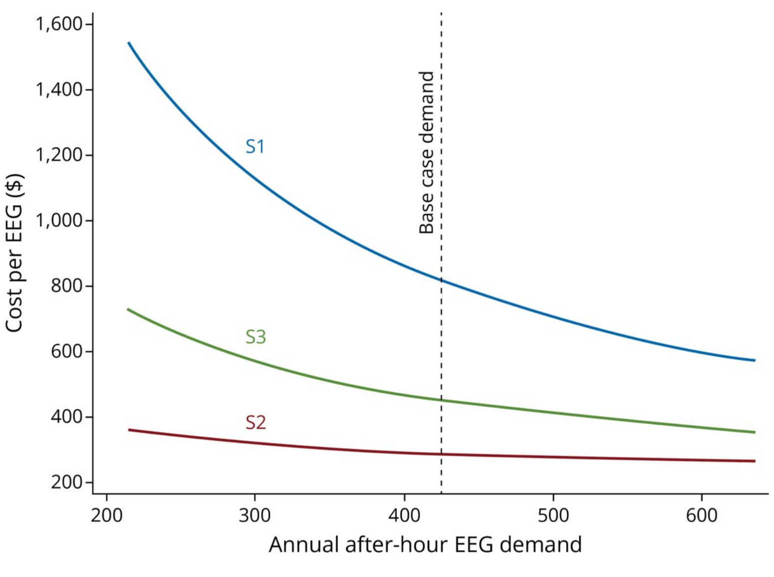
Beyond NCSE, access to after-hour EEG has implications for improved medical decision-making and patient outcomes. For a day ending at 5 PM, a request for EEG that is only performed the next working day could lead to delays of 16 hours or more. In a study at several large academic medical centers, early EEG acquisition was found to increase the diagnostic accuracy of clinician's seizure detection and improve confidence in medical decision-making.[2] An analysis of 625 neonates and pediatric ICU patient records found that the time to EEG was an independent risk factor for in-hospital death,[5] with each hour of delay associated with a cumulative 0.1%–0.2% increase in relative risk of in-hospital mortality. For an EEG that was ordered after hours and not performed until the next working day, the increased relative risk of in-hospital death attributable to delayed EEG may be as high as 3.2%. EEG can be predictive as well as diagnostic, with the highest predicted inpatient seizure risk in the hours immediately after the EEG.[22] Waiting until the next working day to perform the EEG may reduce its prognostic value for seizure considerably.

Without timely access to EEG, patients not seizing can be empirically (and unnecessarily) intubated or treated with parenteral antiseizure medications or transferred to tertiary care centers and hence increasing the cost of patient care.[23] An analysis of nationally representative inpatient data in the United States[6] demonstrated that lack of EEG services in hospitals where patients were admitted for status epilepticus increased the likelihood of interhospital transfer by 22% and that those hospitals in the lowest quartile of inpatient EEG utilization were 2.2 times more likely to transfer patients with status epilepticus. While our analysis focuses on the cost of provision of after-hour EEG rather than the cost-effectiveness of the service, the implications for patient health outcomes and subsequent hospital costs are considerable.

Reimbursement for EEG technologists providing care to hospitalized patients is assumed to be part of the Inpatient Prospective Payment System (Medicare Part A) Diagnosis Related Group (DRG) bundling of services for a final reimbursable cost by third-party payers,.[24] Unlike out-patient and office-based EEGs, the technologist fees (representing the bulk of routine EEG reimbursement) cannot be charged separately for in-patient EEG procedures.[25] The EEG itself may have no consequence on final reimbursement to the hospital unless the results of EEG alter the DRG coding by triggering Major Complications and Comorbidity or Complications and Comorbidity codes. In hospitals without EEG during after-hours, this could be a substantial loss of reimbursement.

We also acknowledge that other approaches to after-hours EEG exist. EEG technologist labor may be provided through outside vendors and potentially covering multiple hospitals is a viable option in some locations. Similarly, locum tenens EEG technologists could potentially provide some or all after-hours

Figure Cost per EEG vs Annual EEG Demand



The cost of an EEG depends on the volume of testing and the staffing plan. Three staffing plans are charted here, showing the decreased cost as the annual test volume increases. It depicts the cost per EEG as annual demand increases, through ±50% of base case demand. The costs are estimated based on 3 staffing scenarios: one single EEG technologist on-site during after-hours (S1); one single EEG technologist on-call from home during after-hours (S2), or the hybrid of S1 and S2. If the same volume of EEGs is performed with a higher number of EEG technologists on-site or on-call, the cost per EEG will be substantially higher.

TAKE-HOME POINTS

- Cost of labor for in-house EEG technologists is the most predominant expenditure.
- Cost should vary across geographic regions and urban areas because of differences in labor cost.
- Cost of an EEG depends on the volume of testing per year and the staffing plan.

coverage. Locums technologists and outside vendor costs were not included in the scope of our analysis. For decision makers, our analysis provides valuable information for the creation of an after-hour EEG service with hospital personnel to compare with business proposals for outside services. We are also mindful that other after-hour EEG staffing models may exist. For instance, EEGs can be recorded out of hours by physicians, epilepsy fellows or attending epileptologist on call, or nurses. However, this practice is not common as the conventional EEG systems are often cumbersome to use and may interfere with the already busy schedules of doctors and nurses.

Future prospective studies are needed to quantify the impact of timely EEG on many of the parameters mentioned in our current work, and future modeling work, powered by the results of such prospective studies, will help to assess the EEG's true cost-benefit ratio.

Conclusion

Our study provides a cost model which explains that access to EEGs during after-hours has a substantial expense because of the labor cost of in-house technologists. This cost is directly related to the number of EEGs performed per year. Here, we discuss that the higher cost of after-hour EEG needs to be weighed against the clinical importance of access to this important diagnostic tool, the timeliness of which can influence clinical decisions. A by-product of our work is a cost-calculator that is made available for users to tailor the parameters according to their needs and realities on the ground at the local level (links.lww.com/CPJ/A513). We hope this will be a useful tool for neurology leaders and administrators alike.

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Kellee Trice, BS, R.EEG/EP.T RPSGT	Neurodiagnostic Technology Programs, Institute of Health Sciences, Hunt Valley, MD	Drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; analysis or interpretation of data
Josef Parvizi, MD, PhD	Department of Neurology and Neurological Sciences, Stanford University School of Medicine, CA	Drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; study concept or design

References

1. Quigg M, Shneker B, Domer P. Current practice in administration and clinical criteria of emergent EEG. *J Clin Neurophysiol.* 2001;18(2):162-165. doi:10.1097/00004691-200103000-00007
2. Vespa PM, Olson DM, John S, et al. Evaluating the clinical impact of rapid response electroencephalography: the DECIDE multicenter prospective observational clinical study. *Crit Care Med.* 2020;48(9):1249-1257. doi:10.1097/CCM.0000000000004428
3. Gururangan K, Razavi B, Parvizi J. Utility of electroencephalography: experience from a U.S. tertiary care medical center. *Clin Neurophysiol.* 2016;127(10):3335-3340. doi:10.1016/j.clinph.2016.08.013
4. Young GB, Jordan KG, Doig GS. An assessment of nonconvulsive seizures in the intensive care unit using continuous EEG monitoring: an investigation of variables associated with mortality. *Neurology.* 1996;47(1):83-89. doi:10.1212/wnl.47.1.83
5. Sanchez Fernandez I, Sansevere AJ, Guerriero RM, et al. Time to electroencephalography is independently associated with outcome in critically ill neonates and children. *Epilepsia.* 2017;58(3):420-428. doi:10.1111/epi.13653
6. Suen CG, Wood AJ, Burke JF, Betjemann JP, Guterman EL. Hospital EEG capability and associations with interhospital transfer in status epilepticus. *Neurol Clin Pract.* 2023;13(2):e200143. doi:10.1212/cpj.0000000000200143

7. Madill ES, Gururangan K, Krishnamohan P. Improved access to rapid electroencephalography at a community hospital reduces inter-hospital transfers for suspected nonconvulsive seizures. *Epileptic Disord.* 2022;24(3):507-516. doi:10.1684/epd.2021.1410
8. Gutierrez-Colina AM, Topjian AA, Dlugos DJ, Abend NS. Electroencephalogram monitoring in critically ill children: indications and strategies. *Pediatr Neurol.* 2012; 46(3):158-161. doi:10.1016/j.pediatrneurol.2011.12.009
9. Abend NS, Topjian AA, Williams S. How much does it cost to identify a critically ill child experiencing electrographic seizures? *J Clin Neurophysiol.* 2015;32(3):257-264. doi:10.1097/WNP.0000000000000170
10. *Neurodiagnostic Profession Salary & Benefits Report*. MO ASET-The Neurodiagnostic Society; 2018.
11. *CMS-public Use File-1751-Equipment*. Accessed June 6, 2021. cms.gov.
12. *GSA Facilities Fee Schedule-2019: General Services Administration*. Accessed June 6, 2021. gsa.gov.
13. *Consumer Price Index*. Bureau of Labor Statistics, U.S. Department of Labor. Accessed June 6, 2021. bls.gov/cpi/.
14. Jordan KG, Schneider AL. Counterpoint: emergency ("Stat") EEG in the Era of nonconvulsive status epilepticus. *Am J Electroneurodiagnostic Technol.* 2009;49(1): 94-104. doi:10.1080/1086508x.2009.11079704
15. Vespa P, Prins M, Ronne-Engstrom E, et al. Increase in extracellular glutamate caused by reduced cerebral perfusion pressure and seizures after human traumatic brain injury: a microdialysis study. *J Neurosurg.* 1998;89(6):971-982. doi:10.3171/jns.1998.89.6.0971
16. Topjian AA, Gutierrez-Colina AM, Sanchez SM, et al. Electrographic status epilepticus is associated with mortality and worse short-term outcome in critically ill children. *Crit Care Med.* 2013;41(1):215-223. doi:10.1097/CCM.0b013e3182668035
17. Payne ET, Zhao XY, Frndova H, et al. Seizure burden is independently associated with short term outcome in critically ill children. *Brain.* 2014;137(Pt 5):1429-1438. doi:10.1093/brain/awu042
18. Wagenman KL, Blake TP, Sanchez SM, et al. Electrographic status epilepticus and long-term outcome in critically ill children. *Neurology*. 2014;82(5):396-404. doi: 10.1212/WNL.0000000000000082
19. De Marchis GM, Pugin D, Meyers E, et al. Seizure burden in subarachnoid hemorrhage associated with functional and cognitive outcome. *Neurology*. 2016;86(3): 253-260. doi:10.1212/WNL.0000000000002281
20. Gainza-Lein M, Sanchez Fernandez I, Jackson M, et al; Pediatric Status Epilepticus Research Group. Association of time to treatment with short-term outcomes for pediatric patients with refractory convulsive status epilepticus. *JAMA Neurol.* 2018; 75(4):410-418. doi:10.1001/jamaneurol.2017.4382
21. Zafar SF, Rosenthal ES, Jing J, et al. Automated annotation of epileptiform burden and its association with outcomes. *Ann Neurol* 2021;90(2):300-311. doi:10.1002/ana.26161
22. Struck AF, Tabaeizadeh M, Schmitt SE, et al. Assessment of the validity of the 2HELPS2B score for inpatient seizure risk prediction. *JAMA Neurol.* 2020;77(4): 500-507. doi:10.1001/jamaneurol.2019.4656
23. Ney JP, Gururangan K, Parvizi J. Modeling the economic value of ceribell rapid response EEG in the inpatient hospital setting. *J Med Econ* 2021;24(1):318-327. doi: 10.1080/13696998.2021.1887877
24. Rimler SB, Gale BD, Reede DL. Diagnosis-related groups and hospital inpatient federal reimbursement. *Radiographics.* 2015;35(6):1825-1834. doi:10.1148/rg.2015150043
25. Barkley G, editor. *CPT® and RBRVS 2013 Annual Symposium -Neurology*. CPT® and RBRVS 2013 Annual Symposium 2012 November 16, 2012; Chicago, IL.
26. *American Time Use Survey*. Bureau of Labor Statistics; 2019. Accessed June 6, 2021. bls.gov/atus.

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