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## Assessment of a Study of Continuous vs Repeat-Spot Electroencephalography in Patients With Critical Illness

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### To the Editor

Rossetti et al<sup>1</sup> report findings of a trial of continuous electroencephalography (cEEG) monitoring vs repeat-spot electroencephalography (rEEG) in patients with critical illness, suggesting that cEEG does not improve the outcome (mortality at 6 months) compared with rEEG. While we congratulate the authors on this trial, the delayed manner in which cEEG recording and review was carried out, the lack of any prespecified intervention, and the infrequent changes in treatment that resulted limit any conclusions on the potential effects of cEEG on the outcome.

Indeed, cEEG was initiated at a mean of 60 hours after admission, and the time from electroencephalography (EEG) indication to application was not reported.<sup>1</sup> In a *JAMA Neurology* podcast on this topic, the first author mentioned that EEGs were only monitored "during working hours,"<sup>1</sup> further postponing detection and treatment of nonconvulsive seizures (NCSz) and status epilepticus. Delayed diagnosis, delayed treatment, seizure duration, and seizure burden are all associated with increased refractoriness, worse functional outcome, and mortality.<sup>2-4</sup> Just recording an EEG cannot possibly improve outcome; only timely intervention that results from it might do that. Yet the study did not include an intervention. Treatment changes that did occur varied widely and were not described in detail, and their effect on seizure burden was not reported at all,<sup>1</sup> making it impossible to assess how acting on cEEG findings might have led to a reduction in NCSz. Continuous EEG led to changes in treatment in 21% of cases, lower than in a prior study (52%),<sup>5</sup> suggesting less aggressive interventions and indicating that only those cases had any chance of improvement in outcome, leading to a markedly underpowered study. The expected long-term benefit of early NCSz control is to prevent seizure-associated neuronal injury, cognitive decline, functional disability, and possibly epilepsy. All of those outcomes correlate with

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NCSz burden in children and adults. Yet none of those were included in the primary or secondary outcomes of this trial (although 6-month overall function was reported as a tertiary outcome).

It is important to stress that patients with recent clinical seizures were excluded; the group randomized to rEEGs could be converted to cEEG; causative mechanisms varied widely, including in the one-third of patients with cardiac arrest; and mortality in those without cardiac arrest favored cEEG by 4.5% (not significant). The study thus mostly highlights the need for more rapid diagnosis and treatment of status epilepticus. Its findings should not dissuade centers from attempting to perform and review cEEG as quickly as possible in patients at risk for status epilepticus.

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