

APPENDIX 1: Search strings

Table I: Pubmed search for EEG and delirium.

Pubmed		
	Search term	Hits
#1	“delirium” [Title/Abstract] OR “delirious” [Title/Abstract] OR “icu syndrome” [Title/Abstract] OR “intensive care syndrome” [Title/Abstract] OR “intensive care unit syndrome” [Title/Abstract] OR “delusion” [Title/Abstract] OR “delusions” [Title/Abstract] OR “delusional” [Title/Abstract] OR “factual” [Title/Abstract] OR "ICU psychosis" [Title/Abstract] OR "acute confusional state" [Title/Abstract] OR "brain failure" [Title/Abstract]	16,446
#2	"Delirium"[Mesh]	4,612
#3	#1 OR #2	17,638
#4	“eeg” [Title/Abstract] OR “electroencephalogram” [Title/Abstract] OR “electroencephalography” [Title/Abstract] OR “brain waves” [Title/Abstract] OR “alpha rhythm” [Title/Abstract] OR “beta rhythm” [Title/Abstract] OR “delta rhythm” [Title/Abstract] OR “theta rhythm” [Title/Abstract]	57,165
#5	"Electroencephalography"[Mesh]	111,827
#6	#4 OR #5	123,948
#7	#3 AND #6 AND [humans]/lim AND ([english]/lim) OR [french]/lim) OR [dutch/lim] OR [german]/lim)	472
	Total	472

Table II: Embase search for EEG and delirium.

Embase		
	Search term	Hits
#1	'delirium':ab,ti OR 'delirious':ab,ti OR 'icu syndrome':ab,ti OR 'intensive care syndrome':ab,ti OR 'intensive care unit syndrome':ab,ti OR 'delusion':ab,ti OR 'delusions':ab,ti OR 'delusional':ab,ti OR 'factual':ab,ti OR 'icu psychosis':ab,ti OR 'acute confusional state':ab,ti OR 'brain failure':ab,ti	21,894
#2	'eeg':ab,ti OR 'electroencephalogram':ab,ti OR 'electroencephalography':ab,ti OR 'brain waves':ab,ti OR 'alpha rhythm':ab,ti OR 'beta rhythm':ab,ti OR 'delta rhythm':ab,ti OR 'theta rhythm':ab,ti	75,391
#3	#1 AND #2 AND [humans]/lim AND ([english]/lim OR [french]/lim OR [dutch]/lim OR [german]/lim)	299
	Total	299

APPENDIX 2: Quantitative EEG

Background quantitative EEG

In quantitative electroencephalography (QEEG), multichannel recordings of EEG are visually or automatically edited to create a sample of artifact-free data. These artifact free-data samples are analyzed using the Fast Fourier Transform. With this technique the power can be quantified at each EEG frequency. The power represents the amount of EEG activity in a particular frequency band measured in μV^2 .^{1} Visually this can be represented in a *power spectrum*. The power spectrum of clinical interest is usually considered to extend from about 1.5 Hz to 20 Hz.^{2} This frequency range has traditionally been separated into 4 frequency bands: delta (1.5 -4 Hz), theta (4-8 Hz), alpha (8-13 Hz), and beta (13-20 Hz).^{1}

Quantitative EEG Parameters

Absolute power:

Amount of EEG activity in a particular frequency band measured in μV^2 .^{1}

BIS index

The Bispectral (BIS) index is determined from frontal EEG data using a complex mathematical algorithm.

Dominant/Peak frequency

Frequency with the maximal power.

Mean/Centroid frequency

The mean or centroid frequency is the frequency that divides the area of the spectrum into two equal parts.^{3}

Peak power

Value of maximal power in certain frequency interval.

Relative power:

Quotient between power in one frequency band and total power across all bands, expressed as a percentage. {1}

Spectral edge frequency

The frequency below which 95 percent the total power of a given signal is located.

α/θ or θ/α :

Quotient of relative power of alpha and theta frequency bands. {1}

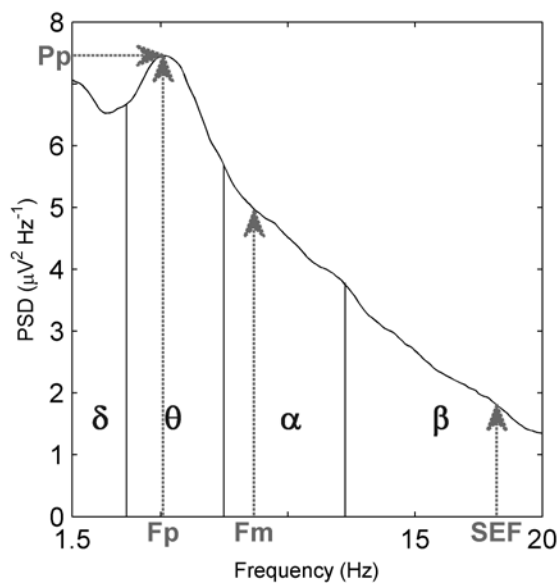
$\beta+\alpha/\theta+\delta$:

Quotient of the relative power of alpha plus beta frequency bands and the relative power of theta +delta frequency bands. {1}

% theta time/% alpha time

The ratio of wave output over time (wave % time) of theta waves (indicative of slowing of EEG activity) to alpha waves. {4}

Power spectrum



Definitions of abbreviations: PSD= Power Spectral Density; Pp= Peak Power; Fp= Peak Frequency; Fm= Mean Frequency; SEF= Spectral Edge Frequency.

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