Table S1. Studies involving technical standards of EEG recording

First author Year	Study type Category (I-IV)	Objective	N (subjects/EEGs)	Outcome measure(s)	Reference
Ferree 2001	Prospective observational III	To evaluate the effect of electrode-scalp impedance on EEG data quality	10	Frequency domain spectral amplitude of EEG signal	EEG recorded with electrode impedance less than 10 kΩ
Kappenman 2010	Prospective observational III	To determine whether data quality is meaningfully reduced by high electrode impedance	17	Frequency domain spectral amplitude of EEG evoked potential signal Noise level (RMS voltage)	EEG recorded with electrode impedance less than 5 kΩ
Rosenzweig 2014	Retrospective observational III	To evaluate utility of subtemporal electrodes in diagnosis of ictal EEG activity originating in the temporal lobe	40	Localization of ictal activity	The decision of the multidisciplinary epilepsy surgery team on the seizure onset zone
Koessler 2015	Retrospective observational III	To evaluate the contribution of mesial temporal and/or neocortical epileptic sources in scalp EEG	7	Localization of spike in interictal 64 channel scalp EEG	Localization of interictal spike in intracranial EEG
Halford 2016	Prospective observational III	To evaluate the usefulness of a prototype battery-powered dry electrode system EEG recording headset	21	Setup time, patient comfort, subject preference and technical quality (visual blinded assessing and power spectra of EEG signal)	EEG recorded with standard electrode system
Keller 2018	Retrospective observational III	To evaluate utility of subtemporal electrodes in presurgical evaluation	37	Identification of ictal and interictal patterns using subtemporal electrodes	Identification of ictal and interictal patterns using standard 10-20 electrode montage

Table S2. Studies addressing the optimal duration of routine and sleep EEG by comparing different length of EEGs

First author Year	Study design (Category)	Comparisons	Total no. of EEGs	% of epileptiform EEGs	Ages (y) (median)	Outcome measure	Results
Reardon 1999	Prospective broad-spectrum observational (I)	[I] 15 min EEG [II] 25 min EEG	420	≈1/3 of patients	Children and adults	IED and non-epileptiform abnormalities	The sensitivity of the 15 min EEG was 94.1% for any abnormality [C:I 88.7-97.4%], and the specificity was 99.3% [CI: 97.5-99.9%]. The sensitivity for IEDs alone was 97.1% [CI: 92.6-99.2%].
Losey 2008	Retrospective broad-spectrum observational (II)	[I] 20 min **SD-EEG** [II] 30 min **SD-EEG** [III] 90 min **SD-EEG** (descriptive)	171	26	NA Adults	Latency to the first IED in 65-384 min **SD-EEG**	Yield of 20 min **SD-EEG** 53% Yield of 30 min **SD-EEG** 71% Yield of 90 min **SD-EEG** 93%
Agbenu 2012	Retrospective broad-spectrum cross-sectional observational (II)	[I] 10 min EEG [II] 15 min EEG [III] 20 min EEG	297	37	0.2- 17 (9.0)	IED and non-epileptiform abnormalities	2.36% of all patients [95% CI: 0.63–4.09%] showed IEDs only in 20 min EEG. 6.42% of patients with IEDs [95% CI: 2.2–11.8%] showed IEDs only in 20 min EEG.
Lee 2013	Retrospective broad-spectrum observational (II)	[I] 10 min EEG [II] 20 min EEG [III] 30 min EEG (descriptive)	328	46	NA Adults	Latency to the first IED or clinical event in 3 h outpatient video-EEG	Yield of 10 min EEG 28% Yield of 20 min EEG 48% Yield of 30 min EEG 64%
Craciun 2014	Retrospective broad-spectrum observational (II)	Routine EEG: [I] 10 [II] 15 [III] 20 [IV] 25 **SD- EEG:** [I] 10 [II] 20 [III] 30 [IV] 40 [IV] 50	1005	44	1-90 (26)	Latency to the second of the same type of IED or non-epileptiform abnormality	There was no significant difference between 20 min and 30 min routine EEG, or 30 min and 60 min **SD-EEG**. Less than 20 min recordings had significantly lower yield compared to longer ones. Yield of 20 min EEG 38% Yield of 30 min **SD- EEG** 45%
Miskin 2015	Retrospective broad-spectrum observational cross-sectional	[I] 20 min EEG [I] 40 min EEG	150	23	0.2-21.5 (6.5)	IED	Yield of 20 min EEG 89% compared to 40 min EEG (p=.0001)

	(II)						
Burkholder 2016	Prospective broad-spectrum observational cross-sectional (I)	[I] 30 min EEG [II] 45 min EEG	1803	24	NA 29% children 71% adults	IED	19.1% (95% CI: 15.6–23%) of IEDs occurred only after the initial 30 minutes.
Doudoux 2018	Retrospective broad-spectrum observational (III)	[I] 5 min EEG [II] 12 min EEG [II] 14 min EEG [III] 18 min EEG [IV] 20 min EEG (descriptive)	364	24	19-94 (56)	IED and non-epileptiform abnormalities	Yield of 5 min EEG 71%, Yield of 12 min EEG 92%
Mahuwala 2019	Retrospective broad-spectrum cohort selection observational cross-sectional study (II)	[I] 30 min EEG [II] 2-hour EEG	14 144	17	NA Children and adults, mean age 46.7	IED and non-epileptiform abnormalities	The yield of 30 min EEG was 3.3%, and was not significantly different from 2 h EEG

IED, interictal epileptiform discharge; NA, not available; CI, confidence interval; SD-EEG, sleep-deprived EEG

Table S3. Studies comparing the yield of sleep in EEGs with partial sleep deprivation to EEGs without sleep deprivation

First author Year	Study design (Category)	Objective	Comparison	N	Ages (y) (median)	Sleep deprivation -protocol	Duration of sleep-deprived EEG (min)	Sleep as a type of outcome measure	Yield of sleep (% of patients)	Adverse effects
Carpay 1997	Prospective narrow-spectrum (patients with newly diagnosed seizures) observational (II)	To evaluate diagnostic yield of sleep-deprived EEG after normal routine EEG	[I] Sleep-deprived EEG [II] Routine EEG	560	0.1-16 (NA) Mean age 6.0	0-2 y: No SD 3-10 y: 7 h sleep 11-15 y: 5 h sleep	90 min	Secondary	[I] 81% [II] 20% (p, NA)	One sleep-deprived child had a generalized tonic-clonic seizure when he was kept awake and during EEG.
Liamsuwan 2000	Retrospective broad-spectrum observational (II)	To evaluate utility of sleep-deprivation to induce sleep	[I] Sleep-deprived EEG [II] Routine EEG	396	< 17 (NA)	1-18 mo.: to stay awake at least 1 hour prior to the EEG >18 mo. – 3 y: child should lose at least 3 h of sleep ≥3 y: child should lose at least 5 h of sleep	90 including prepara-tion	Primary	[I] 77% [II] 44% (p<0.001)	Generalized tonic-clonic seizure in one patient at home in the the morning of recoding.
Gilbert 2004	Retrospective broad-spectrum observational (II)	To evaluate diagnostic yield of sleep-deprived EEG and its utility in sleep induction	[I] Sleep-deprived EEG (two protocols) [II] routine EEG	820	0-18 (NA) Mean age 7.8	< 3 y: to stay awake after 4 AM. 3-11 y: to stay awake after 2 AM >11 y: to stay awake after 12 AM	30	Primary	[I] 44% and 57% [II] 22% (p<0.001)	No data
De Roos 2009	RCT single-blind	To evaluate diagnostic yield of sleep-deprived EEG	[I] Sleep-deprived EEG [II] Routine EEG	99	0.4-18 (8.5)	< 3 y: to stay awake after 04 AM 3-11 y: to stay awake after 02 AM >11y: to stay awake after 12 AM	30	Secondary	[I] 73% [II] 12% (p=0.009)	No data

Table S4. Comparison of the sleep-inducing effects of melatonin or combination of melatonin and partial sleep deprivation to partial sleep deprivation only

First author Year	Study design (Category)	Comparison	N (total) (age range)	Melatonin dose	Sleep-inducing efficacy	Yield of IED in EEG	Adverse effects (frequency)
Wassmer 2001	Prospective broad-spectrum observational (I)	[I] Melatonin [II] pSD	60 163 for adverse effects (1-16 yrs)	2-10 mg	Sleep induction: [I] 80% [II] 80% (NS) *Sleep-onset latency*: [I] 21 min [II] 34 min (p<0.012)	No difference	[I] Tiredness, vomiting, headache (8%)
Sander 2012	Prospective broad-spectrum observational (I)	[I] pSD and melatonin [II] pSD alone	50 (1-18 yrs)	5mg (≤ 7 yrs), 10mg (> 7 yrs)	Sleep induction: [I] 88% [II] 96% (NS) No difference in sleep latency	No difference	None
Gustafsson 2015	Retrospective broad-spectrum observational (II)	[I] Melatonin [II] pSD	240 (1-16 yrs)	3mg (1-4 yrs); 6mg (5-16 yrs)	Sleep induction: Whole group [I] 70% [II] 70% (NS) Children 1-4 yrs [I] 82% [II] 58% (p<0.01)	No difference	No data
Alix 2019	Prospective broad-spectrum observational (51 UK centers) (I)	[I] Melatonin [II] pSD alone [III] melatonin and pSD	565 (1-17 yrs)	2-10mg	N2 sleep induction: [I] 77% [II] 69% [III] 90% (p<0.001)	No difference	No data

NS, not significant; pSD, partial sleep-deprivation; IED, interictal epileptiform discharges

Table S5. Comparison of the sleep-inducing effects of melatonin and various other drugs and of various drugs other than melatonin

First author Year	Study design	Comparison	N total (age)	Melatonin dose	Sleep-inducing efficacy	Yield of ED in EEG	Adverse effects, frequency
Milstein 1998	RCT, double-blind	[I] Melatonin; [II] secobarbital (100mg)	40 (adults)	3 mg	[I] 50%, [II] 65%	No difference	Locomotor impairment, [I] 5%; [II] 30%
Fallah 2014a	RCT, single-blind	[I] Melatonin; [II] oral MDZ (0.75mg/kg)	60 (1-8 yrs)	0.3 mg/kg	[I] 73.3%, [II] 36.7% (p=0.004).	No difference	Transient agitation, [I] 0%; [II] 6.6%

MDZ, midazolam

Table S6. Comparison of the sedative effects of various drugs other than melatonin

Authors	Study design (Category)	Comparison	N (total) (age)	Sleep-inducing efficacy	Yield of ED in EEG	Adverse effects, frequency
Sezer 2013	RCT, open-label	[I] CH (50 mg/kg); [II] Hx (1mg/kg)	282 (4-9 yrs)	[I] 98% [II] 92% (p<0.001)	No difference	Irritability, nausea, vomiting: [I] 8%; [II] 7%
Bektas 2014	RCT, open-label	[I] CH (mean 26.38 mg/kg) [II] Hx (mean 1.43 mg/kg)	141 (0-18 yrs)	[I] 90.7% [II] 89.6% (NS)	No difference	None
Gumus 2015	RCT, open-label	[I] CH (50mg/kg) [II] CH (100mg/kg) [III] Dx (2 µg/kg) [IV] Dx (3 µg/kg) +12h SD in all groups	160 (1-9 yrs)	[I] 77.8% [II] 95% [III] 83.3% [IV] 92.9% (NS)	No information	Vomiting, nausea: [I] 11.1%; [II] 25% [III] 2.4%; [IV] 2.4%
Fallah 2014b	RCT, single-blind	[I] CH [II] CH+promethazine [III] CH+Hx	90 (1-7yrs)	[I] 70% [II] 96.7%	No difference	Vomiting: [I] 6.7%; [III] 6.7%; [III] 16.7% Agitation: [II] 3.3% Hypotension: [III] 3.3%

						[III] 83.3% (p=0.02)	

CH, chloral hydrate; Hz, hydroxyzine; Dx, dexmedetomidine

Table S7. Studies addressing the yield or adverse effects of hyperventilation in EEG

First author and year	Study type (Category)	N of patients or EEGs	Patient characteristics	Patient age (y)	HV protocol	Outcome/ Efficacy measure	Benefit of HV
Ahdab 2014	Retrospective broad-spectrum observational study (II)	1172 consecutive EEGs; 997 patients; 226 EEGs with IED in 191 patients	141 EEGs with IED and appropriate HV	0-94	3 min forcefully inspire and expire (effort "good" or "poor")	Comparison: baseline-HV, Seizures during HV or IED exclusively during HV	HV-exclusive IED (7) or epileptic seizure (1) in 8/141= 5.7% 3 PNES induced by HV, 2.1%) total 7.8%
Angus-Leppan 2007	Retrospective broad-spectrum observational study (II)	580 with HV out of 1000 randomly chosen records	Under 50% received the diagnosis of epilepsy, the majority being generalized epilepsy (based on the analyzed EEG)	0- 101 (mean 31.3)	3 min, sitting up, 20-30 c/min (omitted in age 50+)	Comparison: baseline-HV, IED or seizures exclusively during HV	IED only during HV in 5/60=8,3%; 2 seizures only due to HV 2/580=0.34%
Aurlien 2009	Retrospective narrow-spectrum observational study (III)	325 EEGs, HV performed in 199 patients	EEG with first generalized epileptiform activity	0-90	Not described	Age related occurrence of specific features of generalized epileptiform activity	Sensitivity of generalized IEDs 22.6 % (45/199)
Baldin 2017	Retrospective narrow-spectrum observational study, population based (III)	449	With newly diagnosed epilepsy, at least one EEG; residents of Rochester, Minnesota	≥ 1	American Clinical Neurophysiology Society	Yield of activation-related IED and predictors of finding an activation-related abnormality with multiple EEGs	Low yield for HV Added value overall 7.9%; 10.3 (age 1-19), 5% (age 20 or elder)
Craciun 2015	Prospective broad-spectrum observational study (I)	877	Referred to EEG on suspicion of epilepsy -patients with generalized/focal seizures/PNES	mean 33.8	5 min, 20-30 breaths/min, children: windmill	Comparison: baseline-HV Interictal abnormality (IED or focal slowing) and seizures which occurred only during HV	Seizures in 2.9% after 5 min HV (25/877); in 2,4% (21/877) after 3 min; interictal EEG abnormality only during HV in 2.6% (23/877) after 5 min; 1.8% (16/877) after 3 min

De Marchi 2017	Retrospective narrow-spectrum observational study (III)	100 (328 EEGs)	Genetic (idiopathic) generalized epilepsy	10-70 (mean 24.9)	5 min	A discharge index was calculated by dividing the number of IEDs per recording time (number/min) in each activation task by the rate (number/min) in awake condition. Discharge index above 2.0 was considered as "provocative effect"	HV had a provocative effect in 31% of patients No adverse events
Gelziniene 2015	Prospective (not explicit) narrow-spectrum observational study (III)	59	GGE (49% with JME)	14-17	2.5 minutes	Comparison: baseline-HV, IED, no effect vs provocative (>2x increase in IED)	IED found only during HV in 23.7% of patients.
Hoepner 2013	Retrospective narrow-spectrum controlled study (III)	34 study group 80 controls	Patients with PNES	18-58 study group vs 18-74 control	HV 5 min	No of PNES events in the patient group who were informed about potential adverse effects including seizures vs. control	Significantly more PNES in those who got information. PNES occurred in 6 patients during hyperventilation.
Holmes 2004	Retrospective narrow-spectrum observational study (III)	433	Consecutive patients with VEEG proven epilepsy	10-64	5 minutes	Seizures	Seizures in 0.52% of patients with focal onset epilepsy, none in 49 patients with generalized epilepsy (not characterized structural vs. genetic).
Jabbari 2000	Prospective narrow-spectrum observational study (III)	100	Asymptomatic male volunteers, sleep deprived	18-45	standard	IED, focal or generalized slowing, patterns of uncertain significance	No subject with IED
Kane 2014	Prospective broad-spectrum observational study (I)	3475	Epilepsy or possible epilepsy	1-91	1-7 min (median 3 min in 83% of patients).	Adverse events, seizures and IED seen in association with HV during EEG	Seizures in 2.2% , 0,03% bilateral/generalized tonic-clonic, increase in IED in 12,2%, PNES in 0,9%

Millichap 2006	Case study (IV)	6	Children with sickle cell disease or trait	4-14	3 min	Adverse events	3 patients with neurological symptoms due to HV (review)
Prengler 2005	Case study (IV)	6	Children with sickle cell disease and seizures	3-21	NA	Adverse events	No severe complications
Raybarman 2009	Retrospective narrow-spectrum observational study (III)	275	Genetic generalized epilepsy (generalized tonic-clonic seizures and absences)	3-18 (mean 11)	5 min	Comparison: baseline-HV, IED or seizures	11.6% had increase in IED from baseline, 0.7% had subclinical discharge, 0 had clinical seizures
Romaniuk 2011	Retrospective narrow-spectrum observational study (IV)	139	Genetically proven mitochondrial disease	NA	NA	Stroke like episodes on HV	HV is safe in patients with mitochondrial disease
Siddiqui 2011	Prospective broad-spectrum observational study (I)	326	Consecutive patients in EEG	mean 22.12 (+/-12.79)	3 min	Comparison: baseline-HV, slowing, increase in IED or IED only during HV	21% (43/326) remarkable 9/326 increase in IED (more in genetic generalized epilepsy), 3/326 IED only during HV (2 with absence seizures and 1 with focal IED)
Watemberg 2015	Retrospective narrow-spectrum observational study (III)	62	Childhood absence epilepsy with seizures during HV (no control group)	4-15 (mean 9.3)	3 min HV and 2 min post-HV	Time to the first seizure	Median time to the first seizure: 32s; median time to the second seizure (24/62): 100s; median time to the third seizure (4/62): 109s. 85.5% had a seizure under 90s of HV.
Yenjun 2015	Retrospective narrow-spectrum observational study (III)	76	47 adolescent onset or 29 adult-onset idiopathic generalized epilepsy	11.7-19. (mean 16.5) 20-75 (mean 16.5)	3 min	Generalized IED	Epileptiform discharges in 43% (adolescent onset) and 37 % (in adult onset)

HV, hyperventilation; IED, interictal epileptiform discharge; NA, not available

Table S8. Studies addressing the yield of intermittent photic stimulation in EEG

First author and year	Study type (Category)	Number of patients/EEGs	Patient characteristics	Patient age (y)	IPS protocol	Efficacy measure of IPS compared to baseline	Benefit of IPS
Ahdab 2014	Retrospective broad-spectrum observational study (II)	189 patients 219 EEGs	EEGs with epileptiform discharges	5-70	1-30Hz, 5 s train, 5 s interval, lamp 30cm from eyes	PPR	Added value in 11/189 (5,8%) of patients, one patient had a seizure during IPS
Ahmed 2006	Retrospective broad-spectrum observational study (II)	100	Patients with abnormal EEG (mixed diagnoses, also delirium and stroke)	18-94	1-30Hz, ascending and descending for 10 s each, 5s interval	Slowing and IED	3/100 patients with lateralized sharp waves, one with generalized IED, 5 with lateralized slowing (also in baseline).
Angus-Leppan 2007	Retrospective broad-spectrum observational study (II)	732	<50% received the diagnosis of epilepsy, the majority generalized	0-101 (mean 31.3)	"Standard techniques"	IED Seizures	PPR type 4 in 16/732 (2.2%); PPR type 2-3 in 3/732); 5/732 had seizures provoked by IPS (no generalized tonic-clonic seizures);4/732 had "coincidental" seizures during IPS
Baldin 2017	Retrospective narrow-spectrum observational study (III)	449	Newly diagnosed epilepsy with at least one EEG	One year or older	ACNS	IED and predictors of finding an activation-related abnormality with multiple EEGs	Added value overall 5.1%; 6.5% (age 1-19) vs. 3.3% (20y or more) yield for photic stimulation
De Falco 1992	Retrospective observational broad-spectrum study (II)	2888	Consecutive EEGs, 45 patients with epilepsy	Mean 12	Eye closure	PPR	In 24 (53.3%) of these PPR was evident only (24.2%) or strikingly (28.9%) on eye closure during IPS Eye closure during IPS the most useful method to reveal a PPR in photosensitive patients
De Graaf 1995	Retrospective broad-spectrum descriptive observational study	1493	Different ethnic groups of Namibia – patients with epilepsy	All ages	Three protocols, 16 flashes/set for 5 sets variably with eyes open and eyes closed	PPR, not time locked, outlasting at least 100 msec	PPR in 0.4 % of black population, in 4% of colored, and in 5.2% of whites. Almost entirely confined to the age group of 6-25 years.

	(III)				and/or on eye-closure, 1-25-40 Hz		87% the PPR's were evoked at the moment of eye closure or in the eye-closure state.
De Graaf 1995	Retrospective broad-spectrum descriptive observational study (III)	128	Different ethnic groups – patients with chronic epilepsy (>3 seizures/year) in South Africa	All age groups balanced	Idem to de Graaf 1992	PPR	PPR in 2.7% of whites, 0.1% of blacks, and 0.9% of "mixed race" PPR is influenced by genetics more than environmental factors.
De Marchi 2017	Prospective narrow-spectrum observational study (II)	101	Genetic generalized epilepsy	10-70 (mean 24.9)	"Standard protocol"	Provocative effect: Discharge index > 2 (IED during task/min divided by IED awake/min)	No adverse events Provocative effect in 22.8% of patients
Estraneo 2016	Retrospective narrow-spectrum observational study (III)	73	Inpatients 37 Vegetative state, 25 minimally conscious state (MCS) plus, 11, MCS minus	NA	NA	Background and EEG reactivity	IPS reactivity in 37.8% of patients in vegetative state, in 72.7% of patients in minimally conscious state minus and in 92% of patients in minimally conscious state plus.
Gelziniene 2015	Prospective narrow-spectrum observational study (II)	59	Genetic generalized epilepsy (49% with JME)	14-17	1 - 20Hz, 2.5 minutes	Provocative effect: IED only during IPS or > 2 x increase in IED compared to baseline	Provocative effect in 30.5% of patients
Gregory 1993	Retrospective narrow-spectrum observational study (III)	13658	asymptomatic male applicants for Royal Air Force	17-25	3-50 Hz, eyes open and eyes closed	IED	69 (0.5%) IED, 44 (58%) only on photic stimulation, 43 FU (5-29y): 1 epilepsy -> chance 2-3%
Grosso 2006	Retrospective narrow-spectrum observational study (III)	28	Children with chromosomal anomalies - 21 had epilepsy, 24 had IED on EEG	NA	1-30Hz, 10 s train (5s eyes open, then 5 s closed), 7s interval, lamp 20 cm from nasion,	PPR (Waltz)	14% had PPR (type 4) - i.e. 4 patients

Guellerin 2012	Retrospective case study (IV)	5	Patients with paroxysmal response in low-frequency IPS	19-66	1-50 Hz, 30 cm from nasion, 5 s after closure of the eyes	Occurrence of low-frequency PPR	5 patients in 2003-2005 during adult routine EEG: -3 epilepsy with myoclonic features -etiology: Creutzfeldt–Jakob disease (1), MELAS (2), Kufs disease (1), unknown (1)
Hoepner 2013	Retrospective narrow-spectrum observational study (III)	34 study group 80 controls	Patients with PNES	18-58	1-50 Hz, eyes open and eyes closed	PNES events in the group who were informed about potential adverse effects of IPS vs. controls	Significantly more psychogenic seizures in patients who were informed.
Jabbari 2000	Prospective narrow-spectrum observational study (II)	100	Asymptomatic young male volunteers, sleep deprived	18-45	"Standard protocol"	IED Slowing	No subject with IED or slowing
Jayakar 1990	Retrospective broad-spectrum observational study Control group (II)	3557 study group 48 controls	Patients with epilepsy Normal control subjects	Infants-80 (patients) 6-18 (normal controls)	1-20 Hz, 5-10 sec, eyes open and eyes closed	PPR prolonged and self-limited	None normal subjects showed a PPR. PPRs were seen in 35 (1%) patients, 27 (77%) of these had a definite history of epilepsy, 3 (9%) had a questionable history, and 5 (14%) had no seizures.
Koutroumanidis 2008	Retrospective narrow-spectrum observational study (III)	33	15 Phantom absences 18 Genetic generalized epilepsy with GTCS only	16-69	NA (hyperventilation with breath counting)	Clinical features of patients with GTCS and gen spike wave; PPR	Photosensitivity: 27.8% in Genetic generalized epilepsy with GTCS only (3 posterior PPR, 2 GPPR), 13.5% in patients with phantom absences
Leijten 1998	Prospective narrow-spectrum observational study (III)	25	Photosensitive patients	7-46	2–60 Hz, eye closure, eyes closed, eyes open and eyes open with diffuser Additional influence of a red filter and fixation	Photosensitivity over frequency	Photosensitivity range was maximal in the condition eyes open with diffuser condition; attenuated by red-white filter
Lu 2008	Retrospective	566	Children diagnosed with	1-18	4-25(-50)Hz, 20s each, eye closure,	PPR (Waltz)	PPR present in 31% of genetic generalized epilepsy and 20% of focal onset epilepsy

	narrow-spectrum observational study (III)		epilepsy (various syndromes)		eyes open, eyes closed		
Nagarajan 2003	Retrospective broad-spectrum observational study (II)	263	Children with EEG and IPS	5-16	1-30 Hz, eyes open, eyes closed 15 s train, 5s off, lamp 30cm from eyes	PPR (Waltz)	21/263 had PPR, 16/21 (76.2%) had epilepsy, 15/16 genetic generalized epilepsy
Obeid 1991	Retrospective broad-spectrum observational study (III)	327 study group 192 control group	Saudi and Yemeni Arabs with epilepsy Controls without epilepsy	>15	1-16 Hz (-50 Hz), eyes open, eyes closed, parallel line pattern behind the lamp	Photoconvulsive response	Photosensitivity in 7.3% of Saudi and Yemeni Arabs with epilepsy and 0% of controls
Radhakrishnan 1998	Retrospective broad-spectrum observational study (III)	575	Epilepsy patients, sleep deprived	0,5-66	1-24 Hz, ascending and descending eyes open, eyes closed	PPR	PPR in 3.5% of epilepsy patients from South India The most sensitive frequencies 15-18 Hz Patterned IPS and red color facilitate PPR
Saleem 1994	Retrospective broad-spectrum observational study (II)	1000	Unselected epilepsy patients from Northern India	Mean age 14.5±3.56	6-60 Hz, ascending and a descending, eyes open, eye closure and eyes closed	PPR significant only if outlasted IPS by at least 100 msec	PPR in 0.6% of epilepsy patients from Northern India
Whitehead 2015	Prospective broad-spectrum observational study , multicenter (I)	5383	Patients mostly investigated for possible epilepsy	<1 - 99	Not collected in questionnaire	PPR Seizures PNES	Generalized PPR in 79 patients (1.5%) Seizure in 39 patients (0.7%), generalized tonic clonic seizure in 2 (0.04%) PNES in 49 patients (0.9%) 122 patients (2.3%) had the only useful EEG information from IPS

ACNS, American Clinical Neurophysiology Society; IPS, intermittent photic stimulation; GTCS, generalized tonic-clonic seizure; PNES, psychogenic non-epileptic seizures; PPR, photoparoxysmal reaction

Table S9. Risk of bias in studies addressing technical standards of recording EEG (Table S1). Index tests and reference standards are variable.

Study	RISK OF BIAS			
	PATIENT SELECTION	INDEX TEST	REFERENCE STANDARD	FLOW AND TIMING
Ferree; 2001	☹	☺	☺	☺
Kappenman; 2010	☺	☺	☺	☺
Rosenzweig; 2014	☺	☺	☺	☺
Koessler; 2015	☺	☺	☺	☺
Halford; 2016	☺	☺	☺	☺
Keller; 2018	☺	☺	☺	☺

☺Low Risk, ☹High Risk

Table S10. Risk of bias in studies addressing optimal duration of routine and sleep EEG. Index test and reference standards are EEGs with variable durations. Outcome measure is the yield of recording interictal epileptiform discharge.

Study	RISK OF BIAS			
	PATIENT SELECTION	INDEX TEST	REFERENCE STANDARD	FLOW AND TIMING
Reardon; 1999	☺	☺	☹	☺
Losey; 2008	☺	NA	NA	☺
Agbenu; 2012	☺	☺	☹	☺
Lee; 2013	☹	☹	☺	☹
Craciun; 2014	☺	☺	☹	☺
Miskin; 2015	☺	☺	☹	☺
Burkholder; 2016	☺	☺	☹	☺
Doudoux; 2019	☺	☺	☹	☺
Mahuwala; 2019	☺	☹	☹	☹

☺Low Risk, ☹High Risk, NA; not applicable

Table S11. Study limitations in RCT studies addressing the efficiency of different methods of sleep induction in EEG (Tables S3, S5 and S6). Outcome is achieving sleep during the EEG recording.

Study (Table)	RISK OF BIAS				
	Allocation concealment	Blinding	Accounting of patients and outcome events	Outcome reporting	Other
DeRoos; 2009 (S3)	☺	☹	☺	☺	☺
Milstein;1998 (S5)	☹	☹	☺	☺	☹
Fallah; 2014a (S5)	☹	☹	☺	☺	☹
Sezer; 2013 (S6)	☹	☹	☺	☺	☹
Bektas;2014 (S6)	☹	☹	☺	☺	☹
Gumus 2015 (S6)	☹	☹	☺	☺	☹
Fallah; 2014b (S6)	☹	☹	☺	☺	☹

☺Low Risk, ☹High Risk, NA; not applicable

Table S12. Study limitations in observational studies addressing the efficiency of different sleep induction methods (Table S3 and S4). Outcome is achieving sleep during the EEG recording.

Study	RISK OF BIAS				
	Eligibility criteria	Measurement of both exposure and outcome	Failure to adequately control confounding	Incomplete follow-up	Other
Gilbert; 2004	☹	☺	☹	☺	☹
Liamsuwan; 2000	☹	☺	☺	☺	☹
Carpay 1997	☺	☺	☺	☺	☹
Wassmer; 2001	☺	☺	☹	☺	☺
Gustafsson; 2015	☹	☺	☹	☺	☺
Alix; 2019	☹	☺	☹	☺	☺
Sander; 2012	☹	☺	☹	☺	☺

☺Low Risk, ☹High Risk, NA; not applicable

Table S13. Assessment of the overall quality of evidence of sleep induction methods.

Outcome: yield of sleep during EEG recording							
Comparisons	Initial quality	**Study limitations**	**Inconsistency**	**Imprecision**	**Indirectness**	**Publication bias**	**Quality of evidence**
Sleep deprivation vs. no sleep deprivation	Moderate	No serious	NA	Yes	Yes	Unlikely	Moderate
Sleep deprivation vs. melatonin or sleep deprivation and melatonin vs. melatonin	Low	Serious	NA	Yes	No	Unlikely	Very low
Melatonin vs. other drugs	High	Very serious	NA	Yes	No	Unlikely	Very low
Other drug than melatonin vs. other drug than melatonin	High	Very serious	NA	Yes	No	Possible	Very low

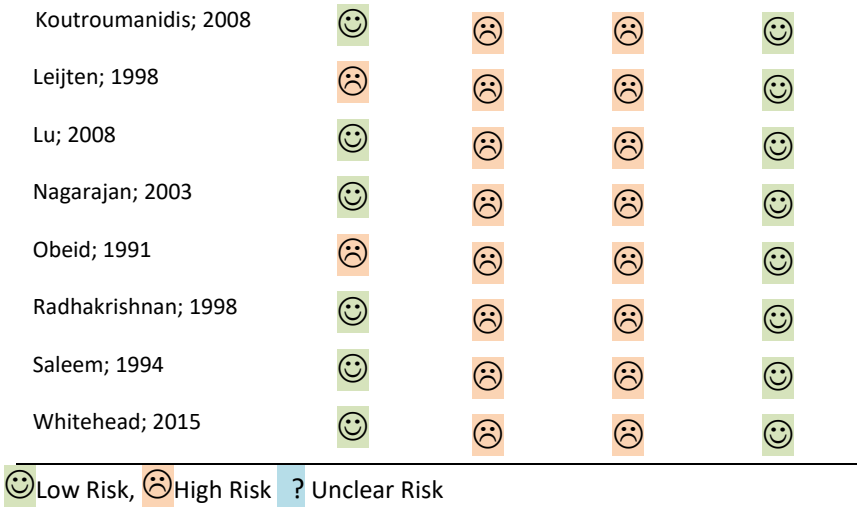
Table S14. Risk of bias in studies addressing yield of hyperventilation in EEG (Table S7). Index test is an EEG with hyperventilation and reference standard is an EEG without activation. Outcome measure is the yield of recording epileptiform discharge.

Study	RISK OF BIAS			
	PATIENT SELECTION	INDEX TEST	REFERENCE STANDARD	FLOW AND TIMING
Ahdab; 2014	☺	☹	☹	☺
Angus-Leppan; 2007	☺	☹	☹	☺
Craciun; 2015	☺	☹	☹	☺
De Marchi; 2017	☺	☹	☹	☺
Gelziniene; 2015	☹	☹	☹	☺
Hoepner; 2013	☹	☹	☹	☹
Holmes; 2004	☺	☹	☹	☺
Jabbari; 2000	☹	☹	☹	☺
Kane; 2014	☺	☹	☹	☺
Millichap; 2006	☹	☹	☹	☺
Prengler; 2005	☹	☹	☹	☺
Raybarman; 2009	☺	☹	☹	☺
Romaniuk; 2011	☹	☹	☹	☺
Siddiqui; 2011	☺	☹	☹	☺
Watemberg; 2015	☺	☹	☹	☺
Yenjun; 2015	☺	☹	☹	☺

☺Low Risk, ☹High Risk

Table S15. Risk of bias in studies addressing the yield of intermittent photic stimulation in EEG (Table S6). Index test is an EEG with photic stimulation and reference test is an EEG without activation. Outcome measure is the yield of recording epileptiform discharge.

Study	RISK OF BIAS			
	PATIENT SELECTION	INDEX TEST	REFERENCE STANDARD	FLOW AND TIMING
Ahdab; 2014	☺	☹	☹	☺
Ahmed; 2006	☺	☹	☹	☺
Angus-Leppan; 2007	☺	☹	☹	☺
Baldin; 2017	☺	☹	☹	☺
De Falco; 1992	☺	☹	☹	☺
De Graaf; 1992	?	☹	☹	☺
De Graaf; 1995	?	☹	☹	☺
De Marchi; 2017	☺	☹	☹	☺
Estraneo; 2016	☺	☹	☹	☺
Gelziniene; 2015	☹	☹	☹	☺
Gregory; 1993	☺	☹	☹	☺
Grosso; 2006	☺	☹	☹	☺
Guellerin; 2012	☺	☹	☹	☺
Hoepner; 2013	☹	☹	☹	☹
Jabbari; 2000	☹	☹	☹	☺
Jayakar; 1990	☺	☹	☹	☺


Koutroumanidis; 2008
Leijten; 1998
Lu; 2008
Nagarajan; 2003
Obeid; 1991
Radhakrishnan; 1998
Saleem; 1994
Whitehead; 2015
Low Risk, High Risk ? Unclear Risk