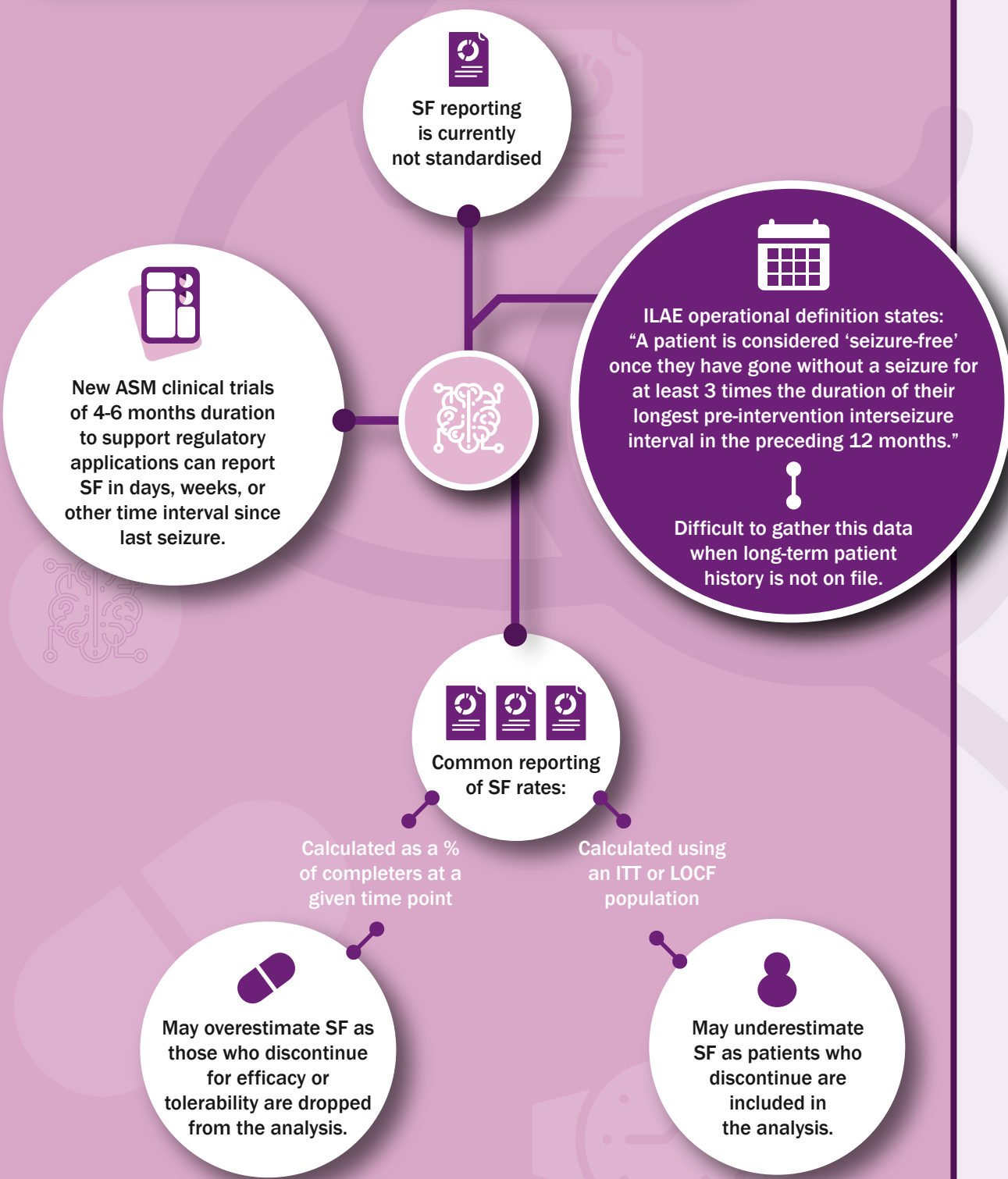


WHAT DOES SEIZURE FREEDOM REALLY MEAN?

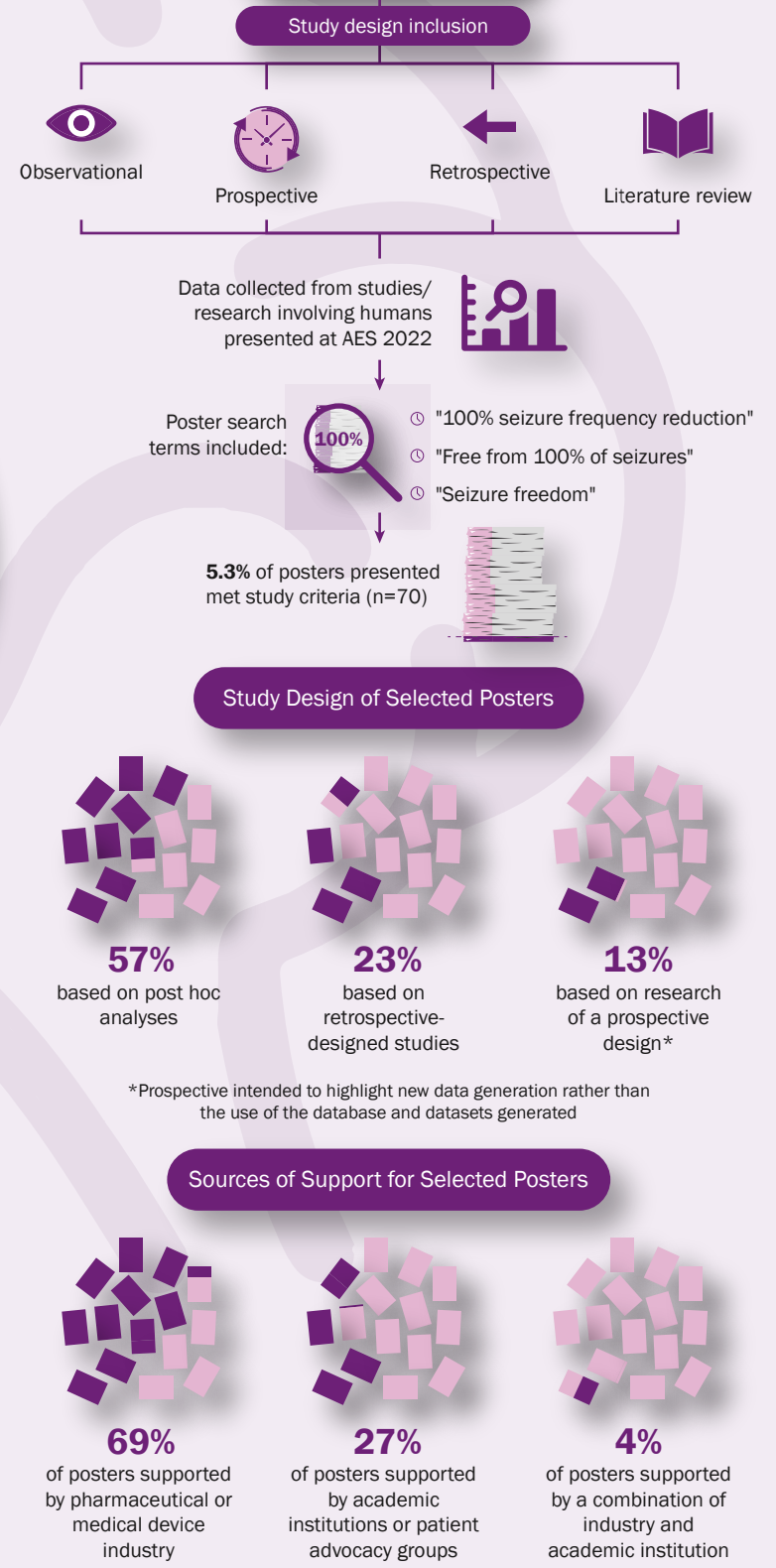
This content was funded by LivaNova PLC. The data presented in this infographic is on file, and has been calculated from analyses of posters presented at the American Epilepsy Society (AES) Annual Meeting 2022. A bibliography of the posters included can be found in the attached appendix.

EMJ Neurol. 2023; DOI/10.33590/emjneuro/10305263. <https://doi.org/10.33590/emjneuro/10305263>.

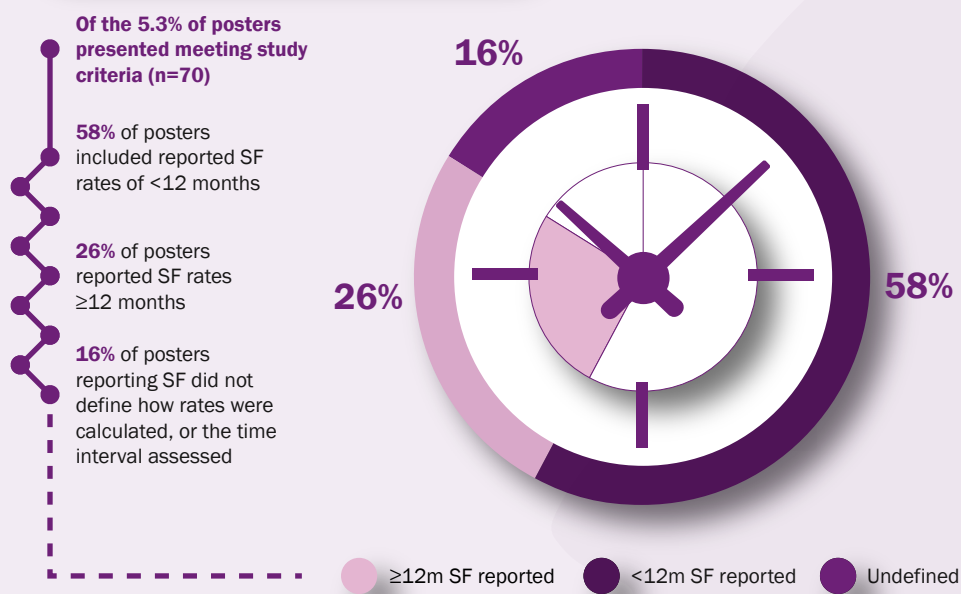
Reporting of Seizure Freedom



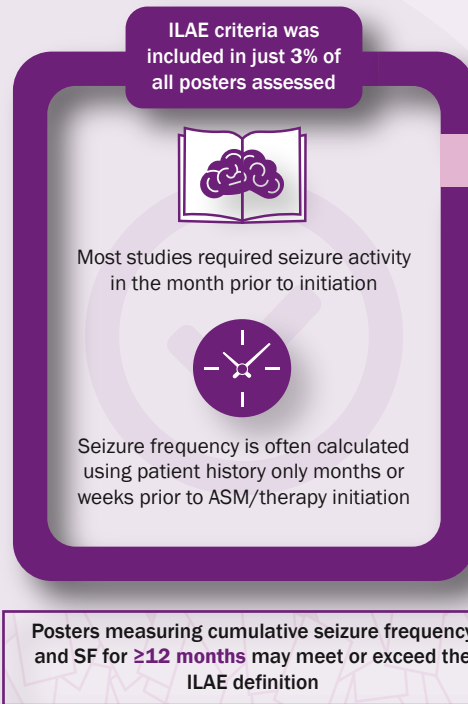
Methodology



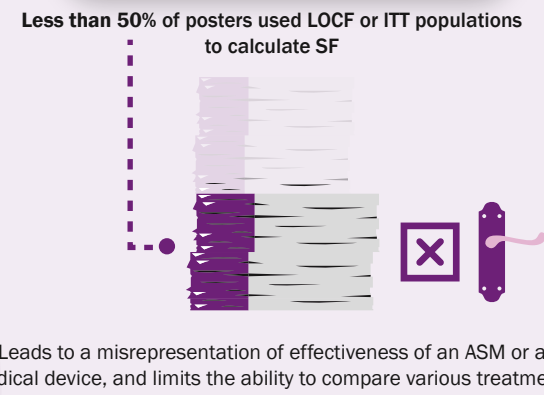
Calculation of Seizure Freedom



Challenges with Comparing Seizure Freedom



Calculation of SF from AES 2022



Clinicians should know the denominator

Researchers focused on epilepsy solutions should highlight methods for SF calculations

Why is Seizure Freedom So HARD to Understand?

Remember:



H
History

What's the longest SF interval over the last 12 months?



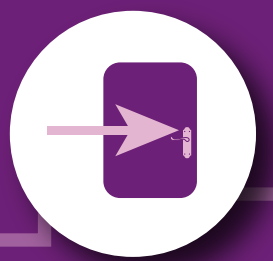
A
Amount of Time

What time interval is being measured for the reported SF rate?



R
Responders

How does the study count patients who responded to therapy with 100% seizure reduction.



D
Dropouts

How are the discontinuations counted in SF calculations?

Abbreviations:

AE: adverse events; AES: American Epilepsy Society; ASM: anti-seizure medication; ILAE: International League Against Epilepsy; ITT: intention to treat; LOCF: last observation carried forward; SF: seizure freedom.

WHAT DOES SEIZURE FREEDOM REALLY MEAN?

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Appendix

- Aboumatar S et al. Reductions in concomitant drug load during adjunctive cenobamate therapy: post-hoc analysis of a subset of patients from a phase 3, multicenter, open-label study. Abstract 2.232. AES Annual Meeting, 2-6 December, 2022.
- Agashe S et al. Cenobamate in genetic generalized epilepsy and combined generalized and focal epilepsy. Abstract 1.224. AES Annual Meeting, 2-6 December, 2022.
- Agrawal S et al. Outcomes with cenobamate use for drug resistant epilepsy in clinical practice. Abstract 3.301. AES Annual Meeting, 2-6 December, 2022.
- Aguglia U et al. Clinical factors associated with response in patients with focal-onset seizures (FOS) in a mirroring clinical practice study of perampanel in adults and adolescents (AMPA). Abstract 2.123. AES Annual Meeting, 2-6 December, 2022.
- Auvin S et al. Seizure-free days as a novel and meaningful outcome in patients with Lennox-Gastaut syndrome: post hoc analysis of patients receiving cannabidiol (CBD) in GWPCARE3 and GWPCARE4. Abstract 1.285. AES Annual Meeting, 2-6 December, 2022.
- Bagary M et al. A 12 month prospective observational study using modified ketogenic diet in adults with drug resistant epilepsy. Abstract 3.448. AES Annual Meeting, 2-6 December, 2022.
- Bansal L et al. Efficacy and tolerability of ultra rapid duty cycling vagus nerve stimulation for medically refractory absence seizures. Abstract 1.22. AES Annual Meeting, 2-6 December, 2022.
- Beattie S et al. A single-center evaluation of responsive neurostimulation as treatment for drug-resistant epilepsy. Abstract 3.223. AES Annual Meeting, 2-6 December, 2022.
- Becker DA, Demko SA. Dose reduction and discontinuation of concomitant antiseizure medications after initiating cenobamate: results from a retrospective review. Abstract 1.314. AES Annual Meeting, 2-6 December, 2022
- Biondo G et al. Prospective Long-term seizure free outcomes in subjects with medically resistant focal epilepsy: results from the HEP2 study. Abstract 3.098. AES Annual Meeting, 2-6 December, 2022.
- Brandt C et al. Adjunctive perampanel for myoclonic and absence seizures: a post hoc pooled analysis of seizure-free days in studies 332, 311, and 232. Abstract 1.286. AES Annual Meeting, 2-6 December, 2022.
- Chen Yi et al. Defining the seizure course of PCDH19 clustering epilepsy. Abstract 1.235. AES Annual Meeting, 2-6 December, 2022.
- Chiacchiaretta M et al. A mirroring clinical practice study of perampanel in adults and adolescents (AMPA): assessment of impact of perampanel on seizure control, sleep, and quality of life (QoL). Abstract 2.124. AES Annual Meeting, 2-6 December, 2022.
- Chul Lim S et al. Long-term efficacy of perampanel monotherapy in patients with newly diagnosed/currently untreated recurrent focal-onset seizures: FREEDOM study 342 extension phase analysis by seizure type. Abstract 2.228. AES Annual Meeting, 2-6 December, 2022.
- Chung S et al. Efficacy, safety, and tolerability of adjunctive eslicarbazepine acetate in focal seizure patients with focal to bilateral tonic-clonic seizures at baseline. Abstract 2.243. AES Annual Meeting, 2-6 December, 2022.
- Cortopassi J, Szaflarski J. Seizure control with cenobamate in an outpatient setting. Abstract 3.432. AES Annual Meeting, 2-6 December, 2022.
- Cross JH et al. Effect of Fenfluramine on generalized tonic-clonic seizures in developmental and epileptic encephalopathies: a review of published studies. Abstract 3.416. AES Annual Meeting, 2-6 December, 2022.
- Daniels T et al. 12-month effectiveness and tolerability of brivaracetam in pediatric patients in the real-world: subgroup data from the EXPERIENCE analysis. Abstract 1.301. AES Annual Meeting, 2-6 December, 2022.
- Dash A et al. Perampanel for the treatment of Asian patients with focal and generalized epilepsy in clinical practice: evidence from the PERMIT study. Abstract 1.311. AES Annual Meeting, 2-6 December, 2022.
- Dave H et al. Treatment outcomes during brivaracetam treatment by seizure freedom status: post-hoc analysis of a real-world, US study. Abstract 1.309. AES Annual Meeting, 2-6 December, 2022.
- Dibué M et al. One-year seizure-freedom in patients treated with adjunctive VNS therapy in Japan. Abstract 3.443. AES Annual Meeting, 2-6 December, 2022.
- Drees C et al. Microburst vagus nerve stimulation: safety and efficacy outcomes. Abstract 1.105. AES Annual Meeting, 2-6 December, 2022.
- Faught E et al. 12-month effectiveness and tolerability of brivaracetam in patients with epilepsy aged ≥ 65 years vs ≥ 16 - < 65 years in the real-world: subgroup data from the international EXPERIENCE pooled analysis. Abstract 1.299. AES Annual Meeting, 2-6 December, 2022.
- French J et al. XEN1101, a novel potassium channel modulator: interim data from an ongoing, long-term, open-label extension of a phase 2b study (X-TOLE) in adults with focal epilepsy. Abstract 2.235. AES Annual Meeting, 2-6 December, 2022.
- Fukuda M et al. Efficacy and safety of adjunctive perampanel in patients aged ≥ 2 years with seizures associated with Lennox-Gastaut syndrome (LGS): analysis by modal dose. Abstract 1.295. AES Annual Meeting, 2-6 December, 2022.
- Garcia-Ron A et al. Real-world experience of treating patients aged < 12 years with perampanel. Abstract 1.31. AES Annual Meeting, 2-6 December, 2022.
- Gelfand M et al. Real-world outcomes in patients on concomitant levetiracetam at brivaracetam initiation: post hoc analysis by levetiracetam discontinuation status. Abstract 3.304. AES Annual Meeting, 2-6 December, 2022.
- Gentile A et al. Efficacy and safety of perampanel as first or only adjunctive therapy in patients with focal-onset seizures (FOS) or generalized tonic-clonic seizures (GTCS) in studies 412, 501, 410, and 509. Abstract 2.121. AES Annual Meeting, 2-6 December, 2022.
- Giallonardo AT et al. A mirroring clinical practice study of perampanel in adults and adolescents (AMPA): analysis of perampanel modal dose on its effectiveness and safety in patients with focal-onset seizures. Abstract 2.125. AES Annual Meeting, 2-6 December, 2022.
- Gil-López FJ et al. Perampanel for treatment of adolescent patients (aged 12 to < 18 years): real-world evidence from PERMIT and PROVE. Abstract 1.313. AES Annual Meeting, 2-6 December, 2022.
- Gil-Nagel A. Stiripentol use in dravet and non-dravet developmental epileptic encephalopathies: an observational study. Abstract 3.300. AES Annual Meeting, 2-6 December, 2022.
- Goldmann T et al. PERPRISE study (PERampanel in patients with primary or secondarily generalized seizures): first interim analysis. Abstract 2.129. AES Annual Meeting, 2-6 December, 2022.
- Im K et al. A study on factors related to seizure outcome in adult-onset epilepsy with cavernous malformation. Abstract 2.154. AES Annual Meeting, 2-6 December, 2022.
- Kang J et al. ELEVATE study 410: effect of dose on response with perampanel monotherapy/first adjunctive therapy in patients with focal-onset seizures (FOS) or generalized tonic-clonic seizures (GTCS). Abstract 2.23. AES Annual Meeting, 2-6 December, 2022.
- Klein P et al. ELEVATE study 410: analysis of time to first seizure with perampanel as monotherapy or first adjunctive therapy in patients with focal-onset seizures (FOS) or generalized tonic-clonic seizures (GTCS). Abstract 2.229. AES Annual Meeting, 2-6 December, 2022.
- Klotz K et al. Long-term safety and efficacy of adjunctive brivaracetam in pediatric patients with epilepsy: an open-label, follow-up trial. Abstract 1.284. AES Annual Meeting, 2-6 December, 2022.
- Koubeissi M et al. Safety and efficacy of adjunctive eslicarbazepine acetate for focal seizures when initiated at 400mg without concomitant carbamazepine. Abstract 2.238. AES Annual Meeting, 2-6 December, 2022.
- Kravets HD, Krutoshinskaya Y. The Stony Brook Medical Center experience with cenobamate for patients with focal drug resistant epilepsy. Abstract 3.306, data on file.
- Laloyaux C et al. 12-month effectiveness and tolerability of brivaracetam by number of prior antiseizure medications and mono vs polytherapy: subgroup data from international EXPERIENCE pooled analysis. Abstract 1.3. AES Annual Meeting, 2-6 December, 2022.
- Machío Castelló M et al. Efficacy and safety of adjunctive cenobamate in patients with super-refractory focal epilepsy. Abstract 3.299. AES Annual Meeting, 2-6 December, 2022.
- Mansi P et al. A mirroring clinical practice study of perampanel in adults and adolescents (AMPA): effect of concomitant enzyme-inducing anti-seizure medication (EIASM) during adjunctive perampanel treatment. Abstract 2.127. AES Annual Meeting, 2-6 December, 2022.
- Marawar R et al. Long-term efficacy and safety of perampanel in a subgroup of older adult patients aged ≥ 60 years from phase iii open-label extension (OLEx) studies. Abstract 1.291. AES Annual Meeting, 2-6 December, 2022.
- Martin M et al. Effectiveness and tolerability of brivaracetam by number of lifetime antiseizure medications in adults with focal onset seizures: pooled data from two real-world studies. Abstract 1.305. AES Annual Meeting, 2-6 December, 2022.
- Mayer T. Long-term effect of cenobamate in a cohort of therapy refractory adult patients with different types of epilepsies. Abstract 1.289. AES Annual Meeting, 2-6 December, 2022.
- Mecarelli O et al. A mirroring clinical practice study of perampanel in adults and adolescents (AMPA): analysis of effectiveness and safety in older patients. Abstract 2.126. AES Annual Meeting, 2-6 December, 2022.
- Mohanty D et al. Responsive neurostimulation (RNS) of thalamic nuclei in pediatric drug resistant epilepsy (DRE): updated outcomes. Abstract 2.141. AES Annual Meeting, 2-6 December, 2022.
- Moreira J et al. Eslicarbazepine acetate monotherapy in post-traumatic epilepsy: a post hoc analysis from a randomized, double blind, non-inferiority clinical trial (BIA-2093-311). Abstract 2.245. AES Annual Meeting, 2-6 December, 2022.
- Nabbout R et al. Starting stiripentol before 2 years of age, a clear benefit for patients with dravet syndrome. Abstract 3.426. AES Annual Meeting, 2-6 December, 2022.
- Nasimbera A et al. Cannabidiol as an adjuvant treatment in adult patients with focal drug resistant epilepsy experience in a public hospital. Buenos Aires, Argentina. Abstract 3.419. AES Annual Meeting, 2-6 December, 2022.
- O'Dwyer R et al. Safety and efficacy of cenobamate for the treatment of focal seizures in older patients. Abstract 1.292. AES Annual Meeting, 2-6 December, 2022.
- Patten A et al. Early and sustained treatment effect of adjunctive perampanel in patients with seizures associated with Lennox-Gastaut syndrome (LGS): a post hoc analysis. Abstract 2.223. AES Annual Meeting, 2-6 December, 2022.
- Porter B et al. Efficacy and safety of perampanel in a randomized, placebo-controlled trial with an open-label extension in patients with seizures associated with Lennox-Gastaut syndrome (LGS). Abstract 1.297. AES Annual Meeting, 2-6 December, 2022.
- Punia V et al. ELEVATE study 410: assessment of cognition (EpiTrack®) following perampanel (monotherapy/first adjunctive) in patients with epilepsy and a history of psychiatric/behavioral events. Abstract 2.231. AES Annual Meeting, 2-6 December, 2022.
- Quintas S et al. Study 512 design: perampanel as first adjunctive therapy in patients aged ≥ 12 years with focal-onset seizures or generalized tonic-clonic seizures associated with genetic generalized epilepsy. Abstract 2.13. AES Annual Meeting, 2-6 December, 2022.
- Sainz Fuertes R et al. Perampanel for treatment of focal and generalized epilepsy in elderly patients (aged ≥ 65 years) in clinical practice: evidence from PERMIT and PROVE. Abstract 1.312. AES Annual Meeting, 2-6 December, 2022.
- Saleem S et al. Comparison of antiseizure medications as monotherapy in focal and generalized epilepsy. Abstract 1.226. AES Annual Meeting, 2-6 December, 2022.
- Saurer T et al. Seizure outcomes with cannabidiol (CBD) in pediatric versus adult patients with Lennox-Gastaut syndrome (LGS) and dravet syndrome (DS): subgroup analysis of BECOME, a caregiver survey. Abstract 3.428. AES Annual Meeting, 2-6 December, 2022.
- Shahid A et al. Use of stiripentol in drug resistant pediatric epilepsies other than dravet syndrome. Abstract 3.309. AES Annual Meeting, 2-6 December, 2022.
- Stern S et al. Predictors of sustainability of response with cenobamate: post-hoc analysis of a subset of patients from a phase 3, multicenter, open-label, safety study. Abstract 2.222. AES Annual Meeting, 2-6 December, 2022.
- Strzelczyk A et al. Treatment of adult epilepsy patients with perampanel: evidence from real-world studies. Abstract 1.315. AES Annual Meeting, 2-6 December, 2022.
- Sullivan J et al. Time-to-event analysis to measure treatment effect of fenfluramine therapy: pooled analysis of two phase 3 studies in dravet syndrome. Abstract 2.434. AES Annual Meeting, 2-6 December, 2022.
- Tedesco Silva L et al. Could cenobamate be used for the treatment of seizures in patients with developmental epileptic encephalopathies? A cross-sectional study. Abstract 2.265. AES Annual Meeting, 2-6 December, 2022.
- Trinka E et al. Perampanel for treatment of focal and generalized epilepsy in everyday clinical practice: evidence from PERMIT and PROVE. Abstract 1.316. AES Annual Meeting, 2-6 December, 2022.
- Tzadok M et al. Real-life experience with purified cannabidiol for refractory epilepsies in children and young adults. Abstract 3.424. AES Annual Meeting, 2-6 December, 2022.
- Villanueva V et al. 12-month effectiveness and tolerability of brivaracetam in the real-world: the international EXPERIENCE pooled analysis. Abstract 1.298. AES Annual Meeting, 2-6 December, 2022.
- Vossler D et al. Efficacy of adjunctive perampanel by two different drop seizure definitions in patients with Lennox-Gastaut syndrome (LGS). Abstract 2.227. AES Annual Meeting, 2-6 December, 2022.
- Wechsler R et al. Predictors of achievement of response with cenobamate: post-hoc analysis of subset of patients from a phase 3, multicenter, open-label, safety study. Abstract 2.221. AES Annual Meeting, 2-6 December, 2022.
- Wook Kim D et al. Perampanel in older adult patients receiving perampanel as first or second adjunctive therapy: an overview of data from studies 412 and 501. Abstract 2.22. AES Annual Meeting, 2-6 December, 2022.
- Xiong Y et al. Neuromodulation for management for super refractory status epilepticus: a systemic review. Abstract 1.348. AES Annual Meeting, 2-6 December, 2022.