

## Review

## Terminology for psychogenic nonepileptic seizures: Making the case for “functional seizures”

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## ABSTRACT

**Purpose:** The purpose of the study was to review the literature on the terminologies for psychogenic nonepileptic seizures (PNES) and make a proposal on the terminology of this condition. This proposal reflects the authors’ own opinions.

**Methods:** We systematically searched MEDLINE (accessed from PubMed) and EMBASE from inception to October 10, 2019 for articles written in English with a main focus on PNES (with or without discussion of other functional neurological disorders) and which either proposed or discussed the accuracy or appropriateness of PNES terminologies.

**Results:** The search strategy reported above yielded 757 articles; 30 articles were eventually included, which were generally of low quality. “Functional seizures” (FS) appeared to be an acceptable terminology to name this condition from the perspective of patients. In addition, FS is a term that is relatively popular with clinicians.

**Conclusion:** From the available evidence, FS meets more of the criteria proposed for an acceptable label than other popular terms in the field. While the term FS is neutral with regard to etiology and pathology (particularly regarding whether psychological or not), other terms such as “dissociative”, “conversion”, or “psychogenic” seizures are not. In addition, FS can potentially facilitate multidisciplinary (physical and psychological) management more than other terms. Adopting a universally accepted terminology to describe this disorder could standardize our approach to the illness and facilitate communication between healthcare professionals, patients, their families, carers, and the wider public.

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## 1. Introduction

Psychogenic nonepileptic seizures (PNES) are self-limited events characterized by paroxysmal changes in feelings, responsiveness, movements, or behavior [1,2]. They may look like epileptic seizures but are not associated with epileptiform changes in the electroencephalogram and therefore with any evidence of any electrical dysfunction of the brain [1]. There is increasing evidence of abnormal brain function, yet the neurobiological underpinnings of this condition remain largely unclear [3]. Despite current scientific findings pointing to both neurobiological and psychological bases [1,3], PNES are often defined in terms of

what they are not rather than what they are (i.e., “nonepileptic”), and there is not even a universally accepted/used terminology [1,4].

Several different terms have been used in the medical literature to describe PNES [4]. “Psychogenic nonepileptic seizures” has emerged in recent years as the most commonly adopted term to describe this condition [4]. For this reason, we have primarily focused on the term PNES in the current manuscript, although other terms are currently used, especially “dissociative” or “conversion” seizures [2,4]. However, various international authors, experts, and patients challenge whether “psychogenic” appropriately defines the condition [5], especially as not all patients have past psychological traumas or current psychiatric problems [1].

Developing an international consensus on terminology is important for many reasons, including improved patient–clinician relationships and interprofessional communications, among others [4]. The aim of the current paper was to systematically and critically review the literature on the terminology for the condition to inform several discussions

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that could influence the decision regarding an optimal term. First, we will discuss the appropriate term to call this condition with regard to its nature (i.e., seizure vs. attack vs. event). Then, we will discuss what could be an appropriate descriptive modifier. Finally, we make our proposal on the terminology of this condition. This proposal reflects the authors' own opinions.

## 2. Materials and methods

First, we did a systematic review ([Appendix 1 \[6,7\]](#)). We systematically searched MEDLINE (accessed from PubMed) and EMBASE from inception to October 10, 2019. In both electronic databases, we used the following search strategy: (“psychogenic” OR “non-epileptic” OR “dissociative seizure”) AND (“terminology” OR “phenomenology” OR “definition”). We restricted the search to these terms, excluding some obsolete names (e.g., pseudoseizure and hysterioepilepsy [4]). We included articles written in English with a main focus on PNES (with or without discussion of other functional neurological disorders) and which either proposed or discussed the accuracy/appropriateness of a certain PNES terminology.

The first two authors (AAP and FB) selected the relevant articles after reviewing their titles, abstracts, and full texts. Also included were some of the references of the selected articles if they were relevant. Retrieved items were independently screened and selected for possible inclusion by two reviewers (AAP and FB); any disagreement was resolved through discussion. The same reviewers independently extracted the following data: study authors, study design and methods, and main results. The methodological quality of included studies was assessed and discussed narratively. Classes of evidence were categorized using the American Academy of Neurology's criteria for studies of causation ([Appendix 2](#)) [8].

## 3. Results

The reported search strategy yielded 757 articles. After excluding duplicates ( $n = 251$ ) and reading titles, abstracts, and full texts, 30 articles were included in the current review ([Appendix 1](#)). [Table 1](#) shows a summary of the included 30 published materials. All studies were of low quality (class IV) evidence. Twelve studies were field study (surveys or observational studies; seven studies investigated patients and five of the articles studied healthcare professionals), seven were reviews, and 11 were letters. While the authors acknowledge that the literature on the terminology of this condition is limited and of generally low quality, “functional seizures” (FS) appears to be an acceptable terminology to name this condition (PNES) from the perspective of patients (based on the findings from three studies); “functional seizures” was significantly a less offensive terminology than other terms for patients and their caregivers (references [9,15,17] in [Table 1](#)). In addition, “functional” is a term that is relatively popular with clinicians, again based on the findings from three studies (references [13,16,19] in [Table 1](#)). However, this is based on results described in a few studies out of 30. Therefore, the current manuscript is essentially an opinion piece by the authors. The following text describes and discusses the elements of the terminology for this common condition.

## 4. Discussion

There is a shortage of high-quality data on the optimal terminology for this disorder. However, adopting universally accepted terminology to describe this condition is necessary to facilitate communication between healthcare professionals and between such professionals and both patients, their caregivers, and the wider public. Authors relied on the results of a systematic review of the literature to provide a formal proposal of terminology. This proposal reflects the authors' own opinions but takes into account the data from the available literature.

### 4.1. Is it a “seizure”, “attack”, or “event”?

By definition from Cambridge English dictionary, an “event” is anything that happens, especially something important or unusual (both in English and in American English) [37]; an “attack” is a sudden and short period of illness [38]; a “seizure” is a very sudden attack of an illness in which someone becomes unconscious or develops violent movements [39].

Semiologically, PNES are paroxysmal, time-limited alterations of bodily/mental functions, manifested in movements, responsiveness, behavior, or sensations [1,22]. Therefore, the term “seizure” appropriately describes the semiology of this condition in comparison with the terms “event” and “attack” and is more specific.

The term “seizure” may be descriptively modified by the preceding terms such as “epileptic”, “hypocalcemic”, “hypoglycemic”, and “febrile”. Hence, the term seizure is not only associated with epilepsy (particularly in English, as some may argue) [22]. In fact, there are many occasions of provoked seizures (e.g., hyponatremic seizures) that are not associated with epilepsy, even though these have electrical brain abnormalities associated with the seizures and some may argue that PNES are outlier with this regard, as the latter do not have any associated electrophysiological changes. Despite this, some professionals and patients alike may associate the term “seizure” with “epilepsy”. Therefore, it is the responsibility of healthcare professionals to educate and explain the condition appropriately for the patients and their families to reduce the possibility of any misunderstanding and confusion [22,23].

While the term “seizure” might best describe the nature of the manifestations of PNES (objective and subjective features) [25,40,41], it is unavoidable that some patients with PNES might not like or adopt to use the term “seizure” [25]. By the same token, the term “attack” is also sometimes not accepted by patients and results in some individuals avoiding the term “attack” as well [11,18]. In fact, many patients may be uncertain as to what to call their condition [24]; this highlights the significant role of healthcare professionals to describe the condition to patients and their families appropriately. Clearly, the explanation should reflect that of a standardized approach rather than a healthcare professional's personal understanding and attitude toward the condition. Unfortunately, labels can negatively influence how some healthcare providers approach their patients and in some instances, the standard of care that is provided. Furthermore, terminologies may affect how and if a patient can access certain treatments (e.g., physical therapy and occupational therapy) and if the treatment is a covered service or self-pay.

### 4.2. Is it “psychogenic”, “dissociative”, or other?

“Psychogenic” means that a condition or illness originates “in mind”, with a psychological etiology, and the same applies to “dissociative” and “conversion”. These terms can be offensive to patients because they risk being misconstrued as inferring patients are exaggerating or even “putting on” symptoms, i.e., feigning [9,15]. While the term “psychogenic” is poorly accepted by patients [9,15], the reasoning against its use is not simply due to patients' preference. It can be argued that this term encourages a dualistic representation of disorder (somatogenic vs. psychogenic) that is no longer supported by research and implies the absence of an organic etiology [5]. It is clear that these seizures have a different etiology to epileptic seizures in that they are not associated with electrophysiological epileptiform changes; they have a mechanistic basis that is different from that in epileptic seizures. However, an association of these seizures with organic (physical) brain dysfunction appears to be very likely based on the recent evidence, albeit preliminary, of functional and structural brain connectivity abnormalities in these patients. There is accumulating evidence that dysfunction of emotion processing areas (e.g., insula), dysregulation of executive control and cognitive processing regions of the brain (e.g., dorsolateral prefrontal cortex, inferior frontal gyrus, and parietal cortex), and an increased focus on somatic function (e.g., attributed to the insula, parietal cortex, and anterior cingulate) may be involved in the

**Table 1**  
A summary of the included manuscripts.

Study	Methods	Main results	Class of evidence
Stone 2003 [9]	Interview of 102 consecutive general neurology outpatients from the UK	"Stress-related seizures" and "functional seizures" were significantly less offensive.	IV
Shneker 2008 [10]	159 physicians from the USA responded to a survey	85% of surveyed physicians reported the term pseudoseizure was appropriate to use.	IV
Plug 2010 [11]	Assessed 21 patients' own preferences to a doctor's use of different labels through the qualitative and quantitative analysis of doctor-patient interactions in the UK	"Seizure" is a particularly popular diagnostic label, while "attack" is dispreferred. "Fit" and "blackout" are even more preferable in patients with PNES.	IV
Mayor 2011 [12]	130 responses to an Internet survey of clinicians from the UK and the Republic of Ireland (66% neurologists)	A majority used the term nonepileptic attacks (62%); psychogenic nonepileptic seizures (7.9%) and psychogenic seizures (4.8%) were not popular.	IV
Sahaya 2012 [13]	115 healthcare providers from the USA responded to a survey	One-third of respondent favored "nonepileptic seizure" as the preferred diagnostic term. This was the most preferred term by both neurologists (56%) and primary care physicians (40%). Other terms included 'stress-related', 'functional', and 'fake' seizures.	IV
LaFrance 2012 [14]	Results from 96 Chilean respondents were compared with results from 307 US clinicians.	"Nonepileptic seizures" was the term most often used both in Chile (n = 34; 36%) and in the US (n = 180; 60%). In Chile, this was followed by the terms "pseudoseizures" (n = 29; 31%) and "psychogenic seizures" (n = 15; 16%); in the US, "spells" (n = 32; 11%) and "psychogenic seizures" (n = 23; 7%).	IV
Morgan 2013 [15]	Surveys from 146 parents or guardians from the USA	"Nonepileptic events", "functional seizures", and "nonepileptic attack disorder" were the least offensive labels; whereas "it is all in his or her head", "hysterical seizures", and "psychogenic seizures" were the most offensive terms.	IV
Wichaidit 2015 [16]	61 pediatricians from Denmark responded to a survey	There was no consensus on which terminology and diagnostic codes to use; the terms most frequently stated to be the most appropriate to use were functional seizures (34%) and PNES (25%).	IV
Ding 2016 [17]	185 participants were recruited from a medical outpatients' waiting area from Australia	"Functional" was significantly less offensive than other terms used (compared with "conversion disorder").	IV
Monzoni 2016 [18]	Video-recorded encounter between 3 neurologists and 17 patients in the UK	Patients rarely choose the term "attack".	IV
Aatti 2016 [19]	963 French psychiatrists were included	44% used the term "psychogenic nonepileptic seizures". The terms "functional/dissociative/conversion seizures" were also commonly used (37%), while 16% used terms such as "pseudoseizures"(12%) or "hysteroepilepsy"(4%).	IV
Yogarajah 2018 [20]	Online survey of 120 general practitioners in the UK	Approximately 75% of participants readily use the term "pseudoseizures".	IV
Bodde 2009 [21]	A critical review	In their opinion, the term "psychogenic nonepileptic seizures" (PNES) is the preferred term.	IV
LaFrance, Jr. 2010 [22]	A review	The author argues in favor of the term "seizure".	IV
Benbadis 2010 [23]	A review	The author argues against the term "seizure".	IV
Brigo 2015 [4]	Information prevalence values for the occurrence of different terms related to PNES were obtained.	The wide spectrum of synonyms used to refer to PNES in the literature reflects a lack of internationally accepted uniform terminology for this condition.	IV
Rawlings 2016 [24]	A systematic synthesis of qualitative studies	Many patients shared a sense of uncertainty surrounding PNES, often resisting psychological explanations.	IV
Reuber 2017 [25]	A narrative review	The authors adopted the term seizure as "seizure" well describes the nature of the manifestations of PNES (objective and subjective features).	IV
Ding 2017 [26]	Conversion disorder: a systematic review of current terminology	Most neurologists favored "functional" and "psychogenic", while laypeople were comfortable with "functional", but viewed "psychogenic" as more offensive.	IV
Scull 1997 [27]	Letter	The author discusses that adopting a uniform terminology to refer to psychogenic nonepileptic seizures is necessary.	IV
Ramos 2010 [28]	Letter	The authors argue in favor of the term "seizure".	IV
Cowan 2010 [29]	Letter	The author argues against the terms "psychogenic" and "seizure".	IV
Sethi 2010 [30]	Letter	The authors argue in favor of the term "seizure".	IV
Karam 2010 [31]	Letter	The author argues against the terms "psychogenic" and "seizure".	IV
Brigo 2015 [32]	Letter	The authors discuss that adopting a uniform terminology to refer to psychogenic nonepileptic seizures is necessary.	IV
Reilly 2015 [33]	Letter	The authors discuss that neurologists, psychiatrists, and others need to work together to reach a consensus regarding what to call this phenomenon.	IV
Labate 2015 [34]	Letter	The authors discuss that adopting a new term to refer to psychogenic nonepileptic seizures is not necessary.	IV
Tannemaat 2015 [35]	Letter	The authors argue in favor of the term "psychogenic nonepileptic seizures"	IV
Brigo 2015 [36]	Letter	The authors discuss that adopting a uniform, unequivocal terminology to refer to psychogenic nonepileptic seizures is necessary.	IV
Barron 2019 [5]	Letter	The authors discuss that: "Psychogenic" is wrong, "Psychogenic" is stigmatizing, and "Nonepileptic" is meaningless and rejecting.	IV

pathophysiology of these seizures [3,42]. While the term “functional seizures” is neutral with regard to etiology and pathology, i.e., whether psychological or physical (i.e., “organic”), other terms are variably so: “dissociative” seizures imply a specific psychological mechanism, albeit one also seen in organic conditions or potentially induced pharmacologically, and both “conversion” (of stress and/or trauma to physical symptoms) seizures and “psychogenic” seizures have clearer positions regarding psychological etiology.

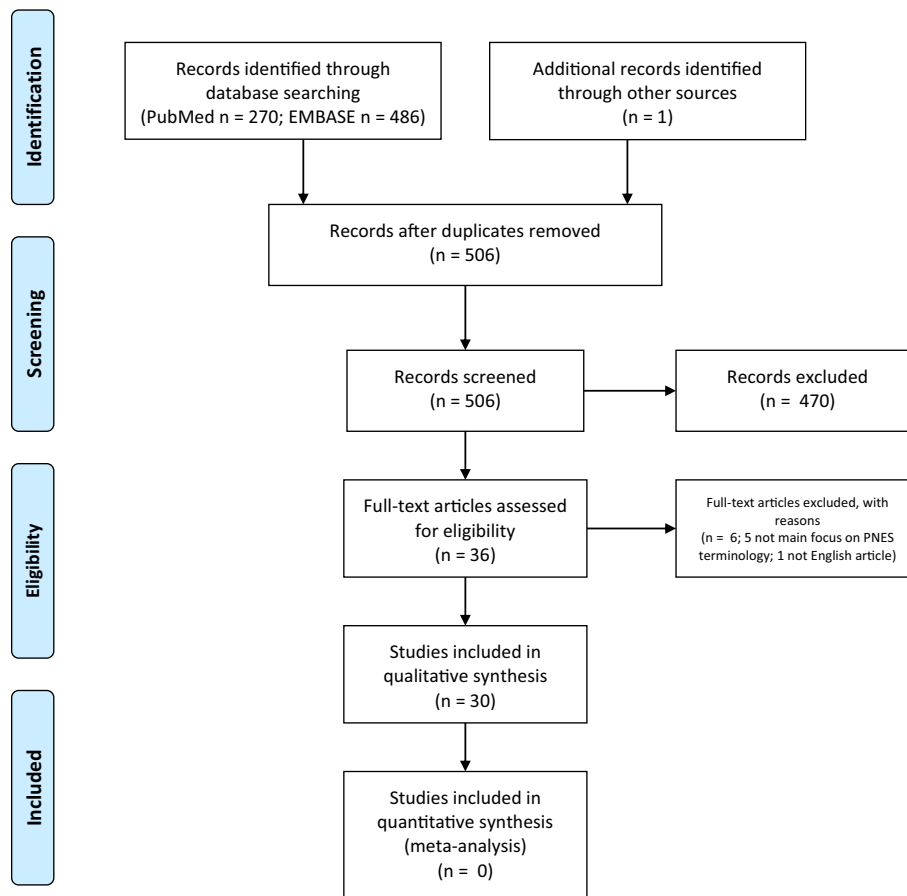
In brief, “psychogenic”, “dissociative”, or “conversion” terminologies can be argued to ascribe a single and specific etiology that falls short of the supportive evidence for a complex and potentially heterogeneous condition, potentially alienating patients for whom a simple psychological cause is not appropriate and therefore does not make sense. On the other hand, the term “functional” points to the above-described potential functional brain dysregulations and permits a more rigorous scientific approach to the study of this patient community by studying neurobiological underpinnings on how functional changes in the brain may produce these seizures. In addition, it opens a prosperous horizon for better engagement of all key stakeholders (e.g., neurologists, psychiatrists, patients, and carers).

On the other hand and based on the evidence, “functional” is a less offensive term for this and other similar conditions than terms such as “dissociative”, “conversion”, or “psychogenic” [9,15,17,43]. The importance of adopting a term that is most descriptive of the pathophysiology with the least negative connotation is not merely semantic; it could have a significant effect not only on how clinicians view this patient community (e.g., it influences how and if neurologists feel this realm of medicine falls in their field of expertise), but also the overall acceptance of the diagnosis and how patients understand and accept the offered therapeutic care [15]. Finally, although psychological factors are identified for the majority of patients with this condition, they are not found in all patients, and it is unclear whether and how they are etiologically relevant [5]. Similarly,

**Table 2**  
Criteria for an ideal terminology: Psychogenic nonepileptic seizures (PNES) vs. Functional seizures (FS).

	Psychogenic nonepileptic seizures (PNES)	Functional seizures (FS)
It is acceptable to patients.	No [9,15,17]	Yes [9,11,15,17,18]
It is acceptable and usable by doctors and other healthcare professionals.	Yes [14,16,19]	Yes [13,16,19]
Does not reinforce unhelpful dualistic thinking.	No (personal opinion)	Yes (personal opinion)
Can be used readily in patients who also have a pathologically established disease (e.g., epilepsy).	Yes (personal opinion)	Yes (personal opinion)
Can be adequate as a stand-alone diagnosis.	Yes (personal opinion)	Yes (personal opinion)
Has a clear core theoretical concept.	Yes (personal opinion)	Yes (personal opinion)
Will facilitate the possibility of multidisciplinary (medical and psychological) treatment.	No (personal opinion)	Yes (personal opinion)
Has similar meaning in different cultures.	Should be investigated	Should be investigated
Is neutral with regard to etiology and pathology (neutral as to mental or organic backgrounds).	No (personal opinion)	Yes (personal opinion)
Has a satisfactory acronym.	No	Yes

some patients with this condition do not experience dissociative symptoms. While the term “functional seizures” will facilitate the possibility of multidisciplinary (medical and psychological) treatments, other terms (“dissociative”, “conversion”, or “psychogenic” seizures) do not provide such an opportunity; this may hamper the management process of the patients.



**Fig. 1.** Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow diagram of the study [6,7].

We should keep in mind that adding a term as a descriptive modifier can help to distinguish these seizures from other seizures (i.e., both epileptic and nonepileptic conditions, such as syncope) [21]. Therefore, considering the above arguments, it seems that the term “functional” is an appropriate descriptive modifier to be used with “seizures” in these patients.

4.3. Is it necessary to mention “nonepileptic”?

It is clearly not ideal to define a disorder by what it is not. Such negative terms provide no relevant positive information regarding the disorder in terms of what it is [5]. In addition, if we follow the above strategy of providing a clear and appropriate description of the condition to patients and their families, we do not need to be worried about creating any confusion or misunderstanding for them as for the diagnosis. Furthermore, a negative diagnosis, i.e., one of elimination, is understandably poorly accepted by many patients, whereas a positive diagnosis helps to understand and accept the disorder and its treatment better [5].

4.4. Our proposal is “functional seizures”

It has been argued that an ideal terminology should fulfill multiple criteria [26,44]. Table 2 shows these criteria for the most commonly used terminology (i.e., PNES) [4] and the proposed term (i.e., functional seizures) for this condition. In our opinion, “functional seizures” appears to be the most appropriate terminology to name this condition (PNES). “Functional” is a term that is relatively popular with both clinicians and the public [4]. It also meets more of the criteria proposed for an acceptable label than other popular terms in the field (Table 2) [26]. When presenting the diagnosis of this condition to a patient, a specific and clear label for the seizures should be provided at the beginning of the encounter along with an appropriate description of the condition to the patients and their families [18]. Some authors have already adopted this term (i.e., functional seizures) to describe this condition [16,20,45].

To anticipate the counterarguments from neurologists, who may argue that epileptic seizures are, in many cases, “functional” or “network” as opposed to “structural” disorders [46], we have to say that yes, epileptic seizures are indeed “functional” or “network” disorders as opposed to “structural” problems, in many patients, but this does not refute that PNES are also a functional disorder [47,48]. In addition, for epileptic seizures, we have a more specific and more appropriate modifier to describe the term “seizure”, that is “epileptic”; but, for PNES, we do not have a better and more specific modifier to adjoin with the term “seizure”.

Perhaps, more importantly, the term “functional seizure” is also in keeping with terminology of other symptoms of the wider disorder that has increasingly become known as Functional Neurologic Disorder (FND), for example, functional paralysis and functional movement disorders (e.g., functional tremor or functional dystonia) [49–51]. Therefore, it is possible to apply a universal term to the whole disorder and its subtypes; an abbreviated terminology has recently been proposed with FND subtypes [e.g., FND-seiz (for seizure), FND-par (for paralysis), and FND-movt (for movement disorders)] [45]. While patients with PNES do not fit into a single category of the current international classifications, the overwhelming majority (if not all) that are given this label fulfill the diagnostic criteria of Functional Neurological (Symptom) Disorder [The Diagnostic and Statistical Manual of Mental Disorders (DSM–5)] [52]. Finally, it is important to acknowledge that the acronym FND has been universally adopted by the patient groups and charities that have developed and flourished over the last decade [53]. We have to clarify that by the use of the modifier “functional”, we do not mean that it is a mere disorder of the function of the brain (“the brain or part of it does not work properly”), without evidence of structural abnormalities! Based on the current literature [42], the presence of subtle structural abnormalities may be expected, at least in some patients with functional seizures. Rather, we adopted this modifier for all the reasons described above.

We acknowledge that this work has some limitations. The arguments about terminology in this article are Anglocentric. We do not know whether the term “functional seizures” translates well in other languages. We should keep in mind that acceptability of terms may change over time, and stigma could be attached to any new terms. These issues should be evaluated in the future.

5. Conclusion

Despite all of the above, physicians and other healthcare professionals in different countries and even in different institutions in one country may prefer one term over another to name this condition [10,12–14,19,27–36,54]. Adopting a universally accepted terminology to describe functional seizures is likely to facilitate better communication between healthcare professionals and critically between such professionals and patients. However, this is a controversial area; some prefer the term “PNES”, while others may prefer “dissociative seizures”, and many are split between the multiple existing terms in the literature. To definitively conclude these differences necessitates the collecting of opinions from a broad range of stakeholders in the field (neurologists, psychiatrists, psychologists, primary care physicians, patients, healthcare planners, managers, etc.) in order to maximize the likelihood that the new term will be accepted and used widely. This could be achieved by a mixture of expert opinion and evidence-based approaches. However, while these various perspectives are important factors to consider, stakeholder opinions should be carefully weighed and scrutinized. Appropriate terminology should take into consideration both our current scientific understanding and limitations, as well as its influence on diagnosis, management, and future research into the condition. Labels not only define illness but also patients, so it is imperative that every effort is made to eliminate bias and improve overall patient care.

Declaration of competing interest

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None.

Appendix 1

Appendix 2. American Academy of Neurology criteria for classification of evidence in studies of causation [7]

Classification	Criteria
I	Prospective cohort study with all relevant confounders controlled, masked, or objective outcome assessments, and a) ≤2 primary outcomes, b) clearly defined inclusion/exclusion criteria, and c) ≥80% study completion rate.

(continued)

Classification	Criteria
II	Retrospective cohort study or case-control study meeting all other class I criteria.
III	Cohort study or case-control study meeting all class I or II criteria except a, b, or c above.
IV	Studies not meeting Class I, II, or III criteria

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