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Psychogenic Nonepileptic Seizures

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Overview

Background

Psychogenic nonepileptic seizures (PNES), or pseudoseizures are paroxysmal episodes that resemble and are often misdiagnosed as epileptic seizures; however, PNES are psychological (i.e., emotional, stress-related) in origin.

Paroxysmal nonepileptic episodes can be either organic or psychogenic. Syncope, migraine, and transient ischemic attacks (TIAs) are examples of organic nonepileptic paroxysmal symptoms. This article covers only PNES.

The terminology on the topic has been variable and, at times, confusing. Various terms are used, including pseudoseizures, nonepileptic seizures, nonepileptic events, and psychogenic seizures. PNES has been the preferred term in the literature, but in practice, the term "seizures" is confusing to patients and families, so that it is probably best to replace it with more general terms that so not imply epilepsy, such as "attacks" or "events."[1]

PNES are common at epilepsy centers, where they are seen in 20-30% of patients referred for refractory seizures. PNES are probably also common in the general population, with an estimated prevalence of 2-33 cases per 100,000 population, which makes PNES nearly as prevalent as multiple sclerosis or trigeminal neuralgia.

Diagnostic Criteria (DSM-5)

By definition, PNES is a psychiatric disorder; more specifically it is a conversion disorder, which falls under the diagnostic category of somatic symptom disorders in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). According to the DSM-5 classification, neurological symptoms that are found, after appropriate neurological assessment, to be incompatible with neurological pathophysiology can fall under conversion disorder, factitious disorder, or malingering.

The specific DSM-5 criteria for conversion disorder are as follows :[18]

One or more symptoms of altered voluntary motor or sensory function

- Clinical findings provide evidence of incompatibility between the symptom and recognized neurological or medical conditions
- The symptom or deficit is not better explained by another medical or mental disorder
- The symptom or deficit causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation

PNES falls under the symptom subtype of “with attacks or seizures.”

Factitious disorder and malingering imply that the patient is purposely deceiving the physician (i.e., faking the symptoms). The difference between factitious disorder and malingering is that, in malingering, the reason for the deception is tangible and rationally understandable (albeit possibly reprehensible) such as avoiding military duty, avoiding work, obtaining financial compensation, evading criminal prosecution, or obtaining drugs. In factitious disorder, the motivation is a pathologic need for the sick role.

An important corollary is that malingering is not considered a mental illness, whereas factitious disorder is. As such there are no specific diagnostic criteria for malingering.

A generally accepted view is that most patients with PNES have conversion disorder, rather than malingering or factitious disorder.

Although the DSM-5 classification is simple in theory, knowing whether a given patient is faking it is nearly impossible. In some circumstances, intentional faking can be diagnosed only by catching a person in the act of faking (e.g., self-inflicting injuries, ingesting medications or eye drops to cause signs, putting blood in the urine to simulate hematuria).

Malingering may be underdiagnosed, partly because the diagnosis is essentially an accusation.

Psychogenic nonepileptic seizures (PNES) in perspective

The neurology and epilepsy literature on PNES often implies that PNES is a unique disorder. In reality, PNES is but one type of somatic symptom disorder. How the psychopathology is expressed (PNES, paralysis, diarrhea, or pain) is different only in the diagnostic aspects. Fundamentally, the underlying psychopathology, its prognosis, and its management are no different in PNES than they are in other psychogenic symptoms. Whatever the manifestations, psychogenic symptoms are a challenge in both diagnosis and management.

Psychogenic (i.e., nonorganic, functional) symptoms are common in medicine. By conservative estimates, at least 10% of all medical services are provided for psychogenic symptoms. These symptoms are also common in neurology, representing approximately 9% of all inpatient neurology admissions and probably an even higher percentage of outpatient visits. Common neurologic symptoms that are found to be psychogenic include paralysis, mutism, visual symptoms, sensory symptoms, movement disorders, gait or balance problems, and pain.

For several neurologic symptoms, signs or maneuvers have been described to help differentiate organic from nonorganic symptoms. For example, limb weakness is often evaluated by means of the Hoover test, for which a quantitative version has been proposed. Other examples are looking for give-way weakness and alleged blindness with preserved optokinetic nystagmus. More generally, the neurologic examination is often aimed to elicit symptoms or signs that do not make neuroanatomic sense (e.g., facial numbness affecting the angle of the jaw, gait with astasia-abasia or tight-roping).

Every medical specialty has its share of symptoms that can be psychogenic. In gastroenterology, these include vomiting, dysphagia, abdominal pain, and diarrhea. In cardiology, chest pain that is noncardiac is traditionally referred to as musculoskeletal chest pain, but it is probably psychogenic. Symptoms that can be psychogenic in other specialties include shortness of breath and cough in pulmonary medicine, psychogenic globus or dysphonia in otolaryngology, excoriations in dermatology, erectile dysfunction in urology, and blindness or convergence spasms in ophthalmology.

Pain syndromes for which a psychogenic component is likely include tension headaches, chronic back pain, limb pain, rectal pain, and sexual organ pain. Pain is, by definition, entirely subjective; therefore, to confidently say that pain is psychogenic is essentially impossible, and the term psychogenic is all but discredited in the pain literature. One could even argue that all pains are psychogenic; therefore, psychogenic pain is one of the most uncomfortable diagnoses to make. In addition to isolated symptoms, some consider certain syndromes to be at least partly and possibly entirely psychogenic (ie, without any organic basis). These controversial but fashionable diagnoses include fibromyalgia, fibrositis, myofascial pain, chronic fatigue, irritable bowel syndrome, and multiple chemical sensitivity.

For a review of this topic, see the Bibliography.[16, 17, 7]

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Pathophysiology

Unlike epileptic seizures, PNES do not result from an abnormal electrical discharge from the brain; they are a physical manifestation of a psychological disturbance.

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Etiology

Familial pattern

Limited data suggest that conversion disorder frequently occurs in relatives of individuals with conversion disorder. Symptoms are often modeled from affected family members. Therefore, a thorough family history of medical conditions is essential. Case series show an increased risk in monozygotic but not dizygotic twins.

Nongenetic familial factors, such as incestuous sexual abuse in childhood, may be associated with an increased risk for conversion disorder. The conversion disorder may be the only mechanism for communication that remains available to the child

or adolescent.

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Epidemiology

PNES are commonly misdiagnosed as epilepsy. It is by far the most frequent nonepileptic condition seen in epilepsy centers, where they represent 20-30% of referrals.[19] About 50-70% of patients become seizure-free after diagnosis, and about 15% also have epilepsy.

Similar to conversion disorders, PNES typically begin in young adulthood and occur more frequently in women (approximately 70% of cases) than in men. PNES can also occur in the elderly.

One should be particularly cautious in diagnosing PNES (and psychogenic symptoms in general) when the onset is in early childhood or old age. In these age groups, nonepileptic physiologic events may be more common than other conditions. For example, children may have parasomnias (e.g., night terrors), breath-holding spells, and shuddering attacks.

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Prognosis

In general, outcomes in adults are tenuous. PNES severely affects the quality of life of affected patients. After having symptoms for ten years, more than half of all patients continue to have seizures and remain dependent on social security benefits.

Outcomes are improved with education, with an onset and diagnosis at a young age, with episodes characterized by nondramatic features, with few additional somatoform complaints, with low dissociation scores, and with low scores on the high-order personality dimensions (i.e., inhibition, emotional dysregulation, compulsivity).

Patients with the limp or catatonic type may have a better prognosis than those with the convulsive or thrashing type.

The duration of illness is probably the most important prognostic factor in PNES; the longer the patient has been treated for epilepsy, the worse the prognosis.

- Obtaining a definite diagnosis of PNES early in the course of disease is critical.
- The average delay in the diagnosis of PNES is long, indicating that the index of suspicion for psychogenic symptoms may not be high enough.
- In addition, an accurate diagnosis of PNES significantly reduces subsequent healthcare costs.

With PNES, outcomes are generally better in children and adolescents than in adults, probably because the duration of illness is shorter and the psychopathology or stressors are different in pediatric patients than in adults.

- A refusal to go to school and family discord may be significant factors.
- Serious mood disorders and ongoing sexual or physical abuse are common in children with PNES and should be investigated in every case.

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Patient Education

Thorough patient education is critical and is the first step in treatment. Patients and their families must understand the diagnosis to comply with the recommendations of the psychiatric caregiver.

Written patient information about PNES is scarce but available. For additional information, visit the Comprehensive Epilepsy Program Web site of the University of South Florida.

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Presentation

History

Misdiagnosis of epilepsy is common. Misdiagnosis occurs in approximately 25% of patients with a previous diagnosis of epilepsy that does not respond to drugs. Most cases of misdiagnosed epilepsy are eventually shown to be psychogenic nonepileptic seizures (PNES) or, more rarely, syncope. Other paroxysmal conditions are occasionally misdiagnosed as epilepsy, but PNES is by far the most commonly misdiagnosed condition, accounting for >90% of misdiagnoses at epilepsy centers. EEGs misinterpreted as providing evidence for epilepsy often contribute to this misdiagnosis.[3, 4, 5]

Reversing a misdiagnosis of epilepsy can be difficult, as it is with other chronic conditions. Unfortunately, after the diagnosis of seizures is made, it is easily perpetuated without being questioned, which explains the usual diagnostic delay and cost associated with PNES. Despite the ability to diagnose PNES with near certainty by using EEG-video monitoring, the time to diagnosis is long, about 7-10 years. This delay indicates that neurologists may have an insufficiently high enough index of suspicion for PNES.

The patient's history may suggest the diagnosis. Several clues are useful in clinical practice and should raise the suspicion that seizures may be psychogenic rather than epileptic.

Resistance to antiepileptic drugs (AEDs) is usually the first clue and the reason for referral to the epilepsy center, though intractable epilepsy is the other common cause of resistance to AEDs.

Approximately 80% of patients with PNES have been treated with AEDs before the correct diagnosis is made. A psychogenic etiology should be considered when AEDs have no effect whatsoever on the reported frequency of seizures.

The presence of specific triggers that are unusual for epilepsy may suggest PNES, and these triggers should be specifically sought during history taking. For example, emotional triggers such as stress or becoming upset are common in PNES. Other triggers that suggest PNES include pain, certain movements, sounds, and certain types of lights, especially if they are reported to consistently trigger an apparent seizure.

The circumstances in which attacks occur can be helpful. Like other psychogenic symptoms, those of PNES usually occur in the presence of an audience, and an occurrence in the physician's office or waiting room is highly suggestive of PNES. Similarly, PNES usually do not occur during sleep, though they may seem to and though they may be reported as such.

Details of the episodes often include characteristics that are inconsistent with epileptic seizures.

In particular, some characteristics of the motor (i.e., convulsive) phenomena are associated with PNES (see EEG video monitoring in Other Tests). Common and helpful symptoms include side-to-side shaking of the head, bilateral asynchronous movements (e.g., bicycling), weeping, stuttering, and arching of the back. (See video below.) In a study of 120 seizures (36 PNES and 84 epileptic seizures) from 35 patients, only a few signs were reliable in predicting the diagnosis. PNES were predicted by preserved awareness, eye flutter, and episodes affected by bystanders (intensified or alleviated). Epileptic seizures were predicted by abrupt onset, eye-opening/widening, and postictal confusion/sleep. In addition, as compared with signs viewed on video recording, eyewitness reports of these signs were not reliable.[6] It is important to emphasize that no sign isitselfdiagnostic or 100% specific, but fortunately most patients have several of them.

Psychogenic nonepileptic attacks. The event is provoked by an induction (or provocative) technique. Note the typical irregular nonclonic nontonic and asynchronous movements (including bicycling) with stop-and-go phenomenon.

The patient's medical history can be useful. Coexisting, poorly defined, and probably psychogenic conditions, such as fibromyalgia, chronic pain, and chronic fatigue, are associated with psychogenic symptoms.[7] Similarly, a florid review of systems suggests somatization.

A psychosocial history with evidence of maladaptive behaviors or associated psychiatric diagnoses should raise the suspicion of PNES. Pay particular attention during mental status evaluation, especially to the patient's general demeanor, the appropriateness of this or her level of concern, overdramatization, and hysterical features.

Certain symptoms suggest epileptic seizures. These include significant injury. In particular, tongue biting and an ictal cry[8] are highly specific to generalized tonic-clonic seizures and are helpful signs when present.

Antecedent sexual trauma or abuse is thought to be important in the psychopathology of psychogenic seizures and psychogenic symptoms in general. A history of abuse may be more frequent in convulsive rather than limp type of PNES.

Physical Examination

Physical and neurologic findings are usually normal, but the examination can also uncover suggestive features. For example, overly dramatic behaviors, give-way weakness, and a weak voice or stuttering can be useful predictors.

Psychological features suggestive of psychogenic episodes include anxiety, depression, inappropriate affect or lack of concern (la belle indifference), multiple and vague somatic complaints suggestive of somatization disorder, and abnormal interaction with family members.

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Diagnostic Considerations

Among psychogenic symptoms, PNES are unique in one principal characteristic. With EEG video monitoring, they can be diagnosed with near certainty. This is in sharp contrast to other psychogenic symptoms, which are almost always a diagnosis of exclusion.

This unique feature allows a clarity and confidence of diagnosis that may assist in the critical step of convincing the patient and family of the nonorganic nature of the PNES.

In areas where EEG video monitoring is not available, clinicians can used a staged approach for diagnosis developed by the task force of the International League Against Epilepsy.[20] The task force proposed the following four categories of certainty for PNES diagnosis:

- Documented PNES – confirmed by clinical history plus EEG video monitoring
- Clinically established PNES – defined by clinical history, clinician witness, and EEG recording of habitual events without video
- Probable PNES – determined by clinical history, clinician witness of video or live events, and a normal EEG
- Possible PNES – relies on patient's self-report of clinical events and a normal EEG

Differential Diagnoses

- Absence Seizures
- Ambulatory Electroencephalography (EEG)
- Brainstem Gliomas
- Complex Partial Seizures
- Dizziness, Vertigo, and Imbalance
- Driving and Neurological Disease
- EEG Seizure Monitoring
- Emergent Management of Myasthenia Gravis
- Epilepsia Partialis Continua
- Epileptiform Discharges
- First Adult Seizure
- Focal EEG Waveform Abnormalities
- Frontal Lobe Epilepsy
- Intellectual Disability
- Juvenile Myoclonic Epilepsy

- Pediatric First Seizure
- Pediatric Status Epilepticus

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Workup

Workup

Approach Considerations

Laboratory studies are useful only in excluding metabolic or toxic causes of seizures (e.g., hyponatremia, hypoglycemia, drugs).

Prolactin and creatine kinase (CK) levels rise after generalized tonic-clonic seizures and not after other types of episodes. However, sensitivity is too low to be of any practical value (i.e., lack of elevation does not exclude epileptic seizures).

Although imaging findings are normal in psychogenic nonepileptic seizures (PNES), images should be obtained to exclude organic pathology.

Incidental abnormalities are occasionally seen on imaging. However, they should not confound the diagnosis if results of EEG video monitoring firmly establish PNES.

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EEG and Ambulatory EEG

Because of its low sensitivity, routine EEG is not helpful in confirming a diagnosis of PNES. However, repeatedly normal EEG findings, especially in light of frequent attacks and resistance to medications, can be viewed as a red flag.

Ambulatory EEG is increasingly used, it is cost effective, and it can contribute to the diagnosis by recording the habitual episode and documenting the absence of EEG changes.

However, because of the difficulties in conveying the diagnosis (see Treatment), PNES should always be confirmed with EEG video monitoring.

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EEG Video Monitoring

EEG video monitoring is the criterion standard for diagnosis and indicated in all patients who have frequent seizures despite taking medications. With an experienced epileptologist, combined electroclinical analysis of both the clinical semiology of the ictus and the ictal EEG findings allows for a definitive diagnosis in nearly all cases. If an episode is recorded, the diagnosis is usually easy, and PNES can usually be differentiated from epilepsy. The principle is to record an episode and demonstrate that no change in the EEG occurs during the clinical event and that the clinical episode is not consistent with seizures unaccompanied by EEG changes. Ictal EEG has limitations because of occasional false-negative results or uninterpretable results if movements generate excessive artifact.

Analysis of the ictal semiology (i.e., video) is at least as important as ictal EEG because it often shows behaviors that are obviously and unquestionably nonorganic and incompatible with epileptic seizures. Certain characteristics of the motor phenomena are strongly associated with PNES: gradual onset or termination; pseudosleep; and discontinuous (stop-and-go), irregular, or asynchronous (out-of-phase) activity (e.g., side-to-side head movement), pelvic thrusting, opisthotonic posturing, stuttering, and weeping. A useful sign is preserved awareness during bilateral motor activity; this is relatively specific for PNES because unresponsiveness is almost always present during bilateral motor activity.

In experienced hands, EEG video monitoring is a highly reliable tool, and in the vast majority of cases, the diagnosis of PNES is not difficult. A small percentage of difficult cases account for the less-than-perfect interrater reliability.[9]

Using video EEG of patients, Hubsch et al. conducted multiple correspondence analysis and hierarchical cluster analysis to construct a practical and useful semiologic classification of PNES, which identified 5 clusters of signs: dystonic attack with primitive gestural activity, pauci-kinetic attack with preserved responsiveness, pseudosyncope, hyperkinetic prolonged attack with hyperventilation and auras, and axial dystonic prolonged attack.[10]

For more information, see the Medscape Reference article EEG Video Monitoring.

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Short-term Outpatient EEG Video Monitoring with Activation

When the clinical findings strongly suggest PNES, patients can undergo short-term outpatient EEG video monitoring with activation. This study can be cost-effective while retaining the same specificity as other tests and reasonably high sensitivity.

In one series, 10 of 15 patients had their habitual nonepileptic seizures with hyperventilation plus photic stimulation plus suggestion.

At the author's center, this test is routinely used, and the typical episode is observed in 70-80% of patients, obviating long-term EEG video monitoring.[11]

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Inductions

Provocative techniques, activation procedures, or inductions, can be extremely useful for the diagnosis of PNES, particularly when the diagnosis is uncertain and no spontaneous episodes occur during monitoring.

Many epilepsy centers use a provocative technique to aid in the diagnosis of PNES. An intravenous injection of saline is traditionally and most commonly used, but other techniques may be preferable.

The principle behind provocative techniques is suggestibility, which is a feature of somatoform disorders in general. For example, in psychogenic movement disorders, for which the diagnosis rests solely on phenomenology (sometimes aided by EMG), the response to placebo or suggestion is considered a diagnostic criterion for a definite psychogenic mechanism.

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Treatment

Approach Considerations

Treatment of PNES varies and can include psychotherapy and use of adjunctive medications to treat coexisting anxiety or depression. Psychogenic symptoms are, by definition, a psychiatric disease, and a mental health professional should manage them.

The main obstacle to effective treatment is effective delivery of the diagnosis. The physician delivering the diagnosis must be compassionate, remembering that most patients are not faking, but also firm and confident to avoid the use of ambiguous and confusing terms. Most patients with psychogenic symptoms have previously received a diagnosis of organic disease (e.g., epilepsy); therefore, patients' reactions typically include disbelief and denial, as well as anger and hostility. For example, they may ask "Are you accusing me of faking?" or "Are you saying that I am crazy?"

Patients who accept their diagnosis and follow through with therapy are more likely to experience a successful outcome; therefore, patient education is crucial.

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Medical Care

Goldstein et al reported that, compared with standard medical care, cognitive-behavioral therapy significantly reduced seizure activity in patients with psychogenic nonepileptic seizures.[13] Another study by LaFrance Jr. et al. found that a cognitive behavior therapy-informed psychotherapy significantly reduces the seizures in patients with PNES.[22] This study evaluated the efficacy of medication (flexible-dose sertraline hydrochloride) only, cognitive behavioral therapy informed psychotherapy (CBT-ip) only, CBT-ip with medication (sertraline), and treatment as usual. The CBT-ip group showed a 51.4% seizure reduction and significant improvement from baseline in secondary measures including depression, anxiety, quality of life, and global functioning. The CBT-ip with sertraline group showed 59.3% seizure reduction and the sertraline-only group did not show a reduction in seizures.[22]

Unfortunately, mental health services are not always easily available, especially for noninsured patients. A critical obstacle is that psychiatrists tend to be skeptical about the diagnosis of psychogenic symptoms. Even in PNES, for which EEG video

monitoring allows for near-certain diagnosis, psychiatrists tend to disbelieve the diagnosis.[14] A useful approach to combat this skepticism is to provide the treating psychiatrist with video recordings of the findings, can be more convincing than written reports.

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Consultations

From a practical point of view, the role of the neurologists and other medical specialists is to determine whether organic disease exists. Once the symptoms are shown to be psychogenic, the exact psychiatric diagnosis and its treatment are best handled by the psychiatrist. The neurologist should work with a psychiatrist who understands PNES.

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Medication

Medication Summary

A pilot study in 2010 suggested serotonin selective reuptake inhibitors (SSRIs) may be helpful in reducing seizures in PNES.[15] In a 2013 study, researchers conducted a single-center, double-blind, pilot randomized controlled clinical trial that compared the effects of sertraline and placebo on nonepileptic seizure rates in adults diagnosed with PNES.[21] Of the 128 patients eligible for the study, 38 were randomized to either sertraline or placebo titration group. Dosage in the sertraline group started at 25 mg daily and increased to 50 mg at two weeks and kept increasing further in 50 mg increments to a maximum of 200 mg daily, as tolerated. Frequency of nonepileptic seizures was assessed every 2 weeks for 12 weeks. Seizure frequency at 12 weeks did not differ between the sertraline and placebo groups (relative risk [RR], 0.51; 95% confidence interval [CI], 0.25–1.05; P =0.29). Within-group analysis, which compared the 12-week and baseline event rates, revealed significant reductioninthe sertraline group (RR, 0.55; 95% CI, 0.32–0.93; P =0.03); but not in the placebo group (8% increase; P =0.78).[21]

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Questions & Answers

Overview

What are psychogenic nonepileptic seizures (PNES)?

What are other terms used to describe psychogenic nonepileptic seizures (PNES)?

How common are psychogenic nonepileptic seizures (PNES)?

How are psychogenic nonepileptic seizures (PNES) categorized in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)?

What are the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnostic criteria for psychogenic nonepileptic seizures (PNES)?

How are factitious disorder and malingering differentiated from psychogenic nonepileptic seizures (PNES)?

In what context should psychogenic nonepileptic seizures (PNES) be understood?

What is the pathophysiology of psychogenic nonepileptic seizures (PNES)?

What are possible non-genetic familial factors in the etiology of psychogenic nonepileptic seizures (PNES)?

What is the prevalence of psychogenic nonepileptic seizures (PNES)?

What is the prognosis of psychogenic nonepileptic seizures (PNES)?

What is the most important prognostic factor in psychogenic nonepileptic seizures (PNES)?

What is the role of patient education in the management of psychogenic nonepileptic seizures (PNES)?

Presentation

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