SPECIAL ARTICLE

Management of Functional Seizures Practice Guideline Executive Summary

Report of the AAN Guidelines Subcommittee

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Abstract

This guideline provides evidence-based recommendations for clinicians, patients, and other stakeholders on the management of functional seizures. Following a National Academy of Medicine–compliant process, a multidisciplinary panel conducted a systematic review and integrated the findings with the authors' clinical experience to develop recommendations. A systematic review of the available evidence from first published articles to February 25, 2025, identified 12 Class II–III studies. The review found that psychological interventions are possibly effective in increasing the likelihood of achieving freedom from functional seizures, decreasing the frequency of functional seizures, decreasing anxiety, and improving health-related quality of life and psychosocial functioning for individuals with functional seizures. Key recommendations state that, when evaluating patients with seizure-like episodes, clinicians should seek historical and semiological information (including smartphone videos) from both patients and witnesses and may obtain video-EEG of all typical seizure-like episodes where feasible. Clinicians should evaluate patients diagnosed with functional seizures for co-occurring psychiatric disorders and co-occurring epilepsy. Clinicians should adhere to universal standards of care for patients, including speaking respectfully, refraining from unnecessary harm, and avoiding stigmatizing behavior. Clinicians should provide a specific diagnostic label and rationale for the diagnosis, should engage in shared decision making regarding the treatment plan, and should provide continuity of care to individuals diagnosed with functional seizures. When psychological interventions for functional seizures are indicated, clinicians should counsel patients regarding the potential benefits and risks of these interventions and should refer interested and appropriate patients to these interventions for the treatment of functional seizures. Clinicians should involve family, caregivers, or others in the social support network in the psychological treatment of individuals with functional seizures. Clinicians should not prescribe benzodiazepines or antiseizure medications for patients with functional seizures without co-occurring epilepsy or another indication for these medications and should counsel patients regarding the potential risks and lack of evidence of benefit for using these medications for functional seizures. Clinicians should taper off antiseizure medications for patients with functional seizures and without another indication for these medications. The guideline also identifies gaps in the available evidence and outlines potentially clinically impactful avenues for future research.

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Supplementary Material

Introduction

Functional seizures are transient episodes of altered consciousness or involuntary movements resembling epileptic seizures or syncope but conceptualized to be driven by episodic dissociation or other cognitive-affective mechanisms.[1] Functional seizures have alternatively or previously been

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Glossary

AAN = American Academy of Neurology; **CBT** = cognitive behavioral therapy; **COI** = conflict of interest; **NBT** = neurobehavioral therapy; **PTSD** = post-traumatic stress disorder; **ReACT** = Retraining and Control Therapy; **RMD** = raw mean difference; **RR** = risk ratio; **SMC** = standardized medical care; **SMD** = standardized mean difference; **VEEG** = video-EEG; **WSAS** = Work and Social Adjustment Scale.

labeled as dissociative seizures, psychogenic nonepileptic seizures, psychogenic nonepileptic attacks, or conversion disorder with attacks or seizures.[2] Functional seizure disorders are often characterized by high biopsychosocial complexity, with a range of implicated predisposing vulnerabilities, acute precipitants, and perpetuating factors,[3-5] including concurrent psychiatric conditions and adverse life experiences. Adverse life events can include past or present physical injury; illness; neglect; or physical, emotional, or sexual abuse.[4,6,7] However, co-occurring psychiatric disorders and adverse life experiences are not universally present, are not required diagnostic criteria, and may be less frequent in pediatric populations.[8] Functional seizures are a common and often disabling subtype of functional neurologic symptom disorder, as classified in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition Text Revision*.[9] Functional seizures, and functional neurologic disorder more generally, do not involve the intentional simulation of signs or symptoms and should not be conflated with malingering or factitious disorder, which are much less common.[10]

There is a growing body of evidence demonstrating that psychological treatments may be effective in treating functional seizures,[11] improving quality of life, and reducing health care costs.[12] Nevertheless, most people with functional seizures do not receive targeted and evidence-based treatment, contributing to ongoing functional seizures and disability.[13,14] The limited utilization of evidence-based treatment for functional seizures is due to several factors, including stigmatization of individuals with functional seizures, limited communication and collaboration between neurologists and mental health clinicians, limited access to psychotherapy, poor reimbursements for counseling services, and a lack of familiarity with the disorder among many clinicians and the general public. This practice guideline provides evidence-based recommendations on the use of psychological and pharmacologic interventions in the management of functional seizures to reduce treatment gaps and stigma and improve patient outcomes. The guideline also identifies areas where evidence is unavailable or inadequate to inform future research. The guideline focuses on the following clinical questions:

1. In individuals with functional seizures, what is the efficacy of psychological interventions on the frequency and

Figure 1 Study Selection Flowchart

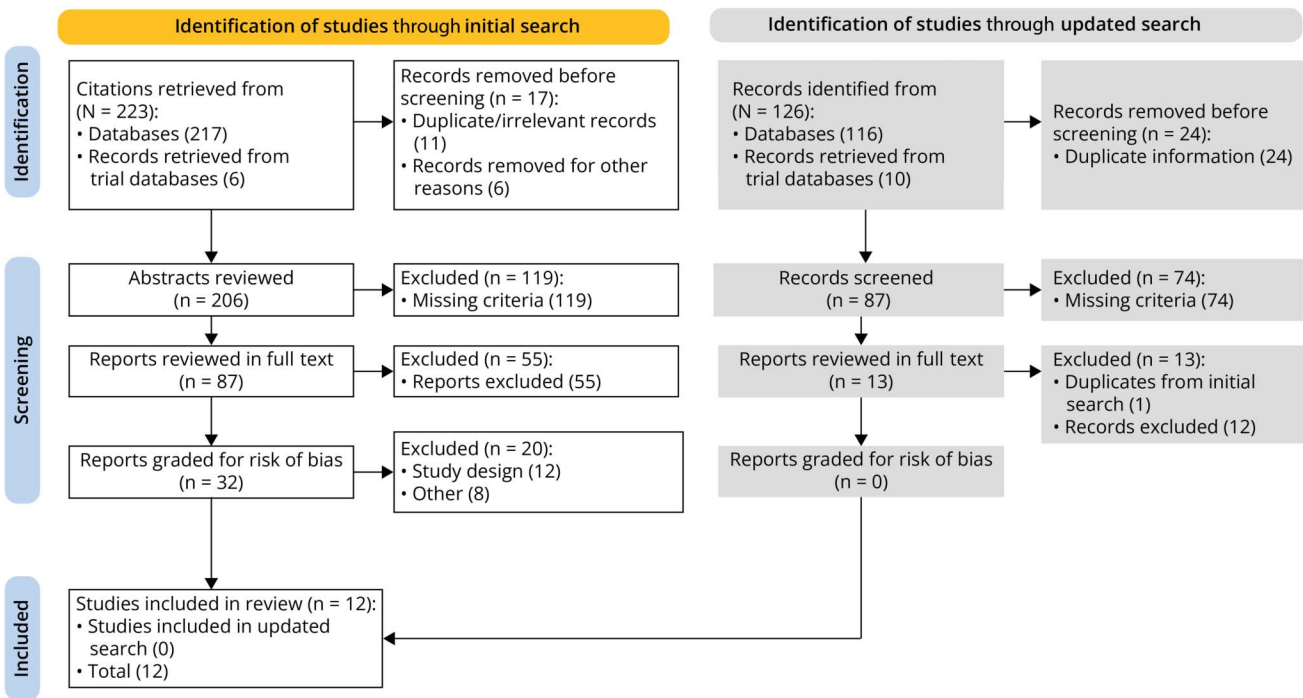


Table 1 Study Participant Demographics

Study and location	N	Mean age, y	% Female sex	Race and/or ethnicity	Employment status	Includes participants with co-occurring epilepsy	Psychiatric comorbidities	% Diagnosed with VEEG
Aboukasm et al., 1998, United States[17]	100	43.3	90	Not available	64% unemployed	Y	Not available	100
Ataoglu et al., 2003, Turkey[18]	30	23 (range 16–30)	97	Not available	Not available	N	Not available	0
Chen et al., 2014, United States[19]	64	50.7	25	Not available	82.8% unemployed	N	39% PTSD	100
Fobian et al., 2020, United States[20]	29	15.1 (SD 2.5)	57	57.1% White, 28.6% Black, 14.3% Other	Not available	Y if free of epileptic seizures >6 mo	52% (anxiety and/or depression)	100
Goldstein et al., 2010, United Kingdom[21]	66	37.4 (SD 12.6) in the intervention arm, 35.9 (SD 15.1) in the control arm	76	87.9% White, 6.0% Black, 4.5% Asian, 1.5% Other	55% unemployed	N	47% (any psychiatric comorbidity)	92
Goldstein et al., 2020, United Kingdom[22]	368	37.5 (SD 14.3)	72	90% White, 2% Black, 2% Asian, 7% Other	66% unemployed	Y if free of epileptic seizures >12 mo	69% (any psychiatric comorbidity)	53
Goldstein et al., 2022, United Kingdom[23]	368	37.5 (SD 14.3)	72	90% White, 2% Black, 2% Asian, 7% Other	66% unemployed	Y if free of epileptic seizures >12 mo	69% (any psychiatric comorbidity)	53
Khattak et al., 2006, Pakistan[24]	100	24.3 (SD 8.76)	88	Not available	Not available	N	Not available	0
LaFrance et al., 2010, United States[25]	38	34.4 (SD 12.6) in the control arm and 38 (SD 13.9) in the intervention arm	76.3	Not available	65.8% unemployed	Y if could be distinguished from functional seizure	61% mood disorders, 87% anxiety disorders	100
LaFrance et al., 2014, United States[26]	38	37.9 (SD 11.5) in the neurobehavioral psychotherapy arm, 39.1 (SD 13.2) in the neurobehavioral psychotherapy + sertraline arm, 39.7 (SD 11.7) in the sertraline arm, and 41.6 (SD 8.3) in the treatment as usual arm	81.6	Not available	68.4% unemployed	N	68% mood disorders, 79% anxiety disorders	100
Senf-Beckenbach et al., 2022, Germany[27]	53	34.7 (SD 17.9)	70.5	Not available	Not available	N	Not available	Not available
Tolchin et al., 2019, United States[28]	55	39.6 (SD 16.8) in the intervention arm and 40.7 (SD 14.3) in the control arm	82.7	66.7% White non-Hispanic, 10% Black non-Hispanic, 21.7% Hispanic	Not available	N	42% depression, 58% anxiety	100

Abbreviations: PTSD = post-traumatic stress disorder; VEEG = video-EEG.

bothersomeness of functional seizures in comparison with standardized medical care?

2. In individuals with functional seizures, what is the efficacy of psychological interventions on health-related quality of life, psychosocial functioning, and psychiatric comorbidities in comparison with standardized medical care?
3. In individuals with functional seizures, what is the efficacy of psychopharmacologic interventions on the frequency

Table 2 Study Interventions, Comparators, and Outcomes

Study	Class	Intervention and duration	Comparator	Outcome measures	Time points
Aboukasm et al., 1998[17]	III	5 or more psychotherapy sessions with protocolized review of videotaped functional seizures	No feedback or no intervention	Functional seizure frequency, quality of life	Not specified
Ataoglu et al., 2002[18]	III	3 wk of twice daily paradoxical therapy	Diazepam 5–15 mg	Freedom from functional seizures, anxiety (HRSA)	6 wk
Chen et al., 2014[19]	III	3 monthly 1.5-hour-long group sessions of group psychoeducation	Routine follow-up in seizure clinic	Functional seizure frequency, functional seizure severity (SSQ), psychosocial functioning (WSAS), functional seizure-related emergency department visits, new functional symptoms, measure of knowledge and perception	3 mo, 6 mo
Fobian et al., 2020[20]	III	8 weekly sessions of Retraining and Control Therapy	8 weekly sessions of nondirective supportive therapy	Functional seizure frequency, freedom from functional seizures, health-related quality of life (PedsQL), anxiety and depression (BASC-2), coping skills (ACOPE), somatization (CSSI)	7 d after treatment
Goldstein et al., 2010[21]	III	12 weekly hour-long CBT sessions (minimum of 9 sessions) + supportive sessions with a neuropsychiatrist	SMC consisting of supportive sessions (no CBT) with neuropsychiatrist	Functional seizure frequency; freedom from functional seizures, anxiety, and depression (HADS); work and social adjustment (WSAS); health service use (modified CSRI)	4 mo, 6 mo
Goldstein et al., 2020[22]	III	CBT + SMC, CBT = 12 sessions over 4–5 mo + 1 booster session at 9 mo after randomization	SMC consisting of meeting with a neurologist, including guidance on delivering the diagnosis and information booklets + regular outpatient care from a psychiatrist with expertise in functional seizures but not including psychotherapy	Functional seizure frequency, freedom from functional seizures, seizure severity and bothersomeness (SSQ), quality of life (SF12v2, EQ-5D-5L), psychosocial functioning (WSAS), anxiety (GAD-7), depression (PHQ-9), psychological distress (CORE-10), somatic symptom burden (modified PHQ-15), caregivers' ratings of functional seizures, clinical impression of improvement (CGI) rated by patient and physician, satisfaction with treatment	12 mo after randomization
Goldstein et al., 2022[23]	III	CBT + SMC, CBT = 12 sessions over 4–5 mo + 1 booster session at 9 mo post randomization	SMC consisting of meeting with a neurologist, including guidance on delivering the diagnosis and information booklets + regular outpatient care from a psychiatrist with expertise in functional seizures, but not including psychotherapy	Functional seizure frequency, seizure severity and bothersomeness (SSQ), quality of life (SF12v2, EQ-5D-5L), psychosocial functioning (WSAS), anxiety (GAD-7), depression (PHQ-9), psychological distress (CORE-10), somatic symptom burden (modified PHQ-15), caregivers' ratings of functional seizures, clinical impression of improvement (CGI) rated by patient and physician, satisfaction with treatment	6 mo after randomization
Khattak et al., 2006[24]	III	Daily behavioral therapy sessions while admitted, followed by 4 weekly behavioral therapy sessions + routine clinical care (drug treatment, reassurance, explanation for symptoms)	Routine clinical care	Functional seizure frequency, psychosocial functioning (CGI), anxiety and depression (HADS)	4 wk after discharge
LaFrance et al., 2010[25]	II	Sertraline 25–200 mg flexible dosing, adjusted in 6 biweekly sessions over 12 wk	Placebo	Functional seizure frequency, freedom from functional seizures, quality of life (QOLIE-31), anxiety (DTS), depression (BDI-II, HRSD), psychosocial functioning (LIFE-RIFT)	12 wk
LaFrance et al., 2014[26]	III	1) Sertraline 25–200 mg flexible dosing; 2) 12 weekly sessions of neurobehavioral psychotherapy; 3) combined neurobehavioral psychotherapy + sertraline	Treatment as usual (follow-up with neurologist without psychotherapy or antidepressant medication)	Functional seizure frequency, freedom from functional seizures, quality of life (QOLIE-31), anxiety (BAI), depression (BDI-II)	16 wk

Continued

Table 2 Study Interventions, Comparators, and Outcomes *(continued)*

Study	Class	Intervention and duration	Comparator	Outcome measures	Time points
Senf-Beckenbach et al., 2022[27]	III	10 weekly sessions of body-focused group psychotherapy (CORDIS)	10 weekly guided self-help group sessions	Level of dissociation (DES-20), seizure severity (LSSS), depression (PHQ-9), somatic symptoms (PHQ-15)	6.5 mo
Tolchin et al., 2019[28]	III	Motivational interviewing followed by 12 weekly sessions of psychotherapy	Informational interview followed by 12 weekly sessions of psychotherapy	Adherence to psychotherapy, change in functional seizure frequency, freedom from functional seizures, quality of life (QOLIE-10), monthly emergency department visits	16 wk

Abbreviations: ACOPE = Adolescent Coping Orientation for Problem Experiences; BAI = Beck Anxiety Index; BASC-2 = Behavior Assessment System for Children, Second Edition; BDI-II = Beck Depression Inventory-II; CBT = Cognitive Behavioral Therapy; CGI = Clinical Global Impressions Scale; CORDIS = a novel integrative body-focused psychotherapy regimen; CORE-10 = Clinical Outcomes in Routine Evaluation-10; CSRI = Client Service Receipt Inventory; CSSI = Children's Somatic Symptoms Inventory; DES-20 = Dissociation Experiences Scale-20; DTS = Davidson Trauma Scale; EQ-5D-5L = EuroQol 5-Dimension 5-Level; GAD-7 = Generalized Anxiety Disorder-7; HADS = Hospital Anxiety and Depression Scale; HRSA = Hamilton Rating Scale for Anxiety; HRSD = Hamilton Rating Scale for Depression; LIFE-RIFT = Longitudinal Interval Follow-up Evaluation–Range of Impaired Functioning Tool; LSSS = Liverpool Seizure Severity Scale; PedsQL = Pediatric Quality of Life Inventory; PHQ-15 = Patient Health Questionnaire-15; PHQ-9 = Patient Health Questionnaire-9; QOLIE-10 = Quality of Life in Epilepsy-10; QOLIE-31 = Quality of Life in Epilepsy-31; SF-12v2 = Short-Form 12-Item Survey-version 2; SMC = standard medical care; SSQ = Seizure Severity Questionnaire; WSAS = Work and Social Adjustment Scale.

and bothersomeness of functional seizures in comparison with placebo or active treatment?

4. In individuals with functional seizures, what is the efficacy of psychopharmacologic interventions on health-related quality of life, psychosocial functioning, and psychiatric comorbidities, in comparison with placebo or active treatment?

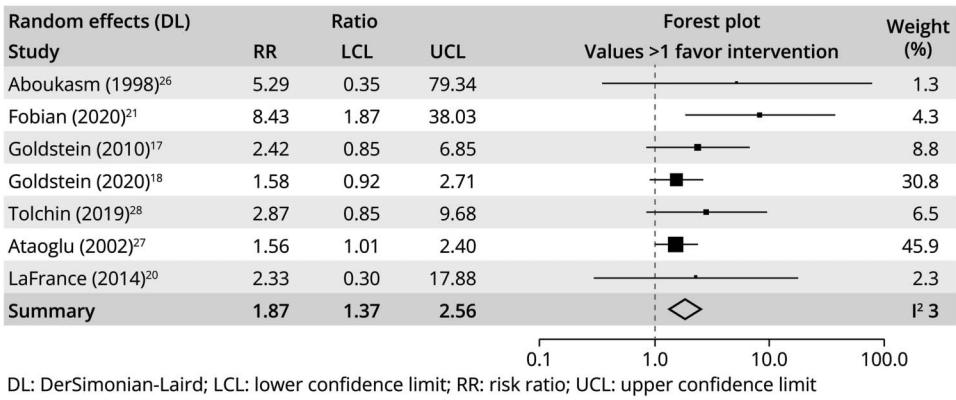
This article is a summary of the complete guideline (eAppendix 1), which includes the full systematic review, additional clinical context, and suggestions for future research.

Description of the Analytic Process

The Guidelines Subcommittee of the American Academy of Neurology (AAN) convened a multidisciplinary panel of experts to develop a practice guideline on the management of functional seizures. As required by the AAN, most (at least 51 percent) of the guideline developers (B.T., L.H.G., M.R., J.S., D.L.P., J.D., L.H.H., Z.P.L., S.J.S., P.G., B.M., C.T., and M.O.) and the lead developer (B.T.) are free of conflict of interest (COI) relevant to the subject matter of this guideline. Two members were determined to have relevant COIs (W.C.L. and A.D.F.), but they were judged to be not significant enough to preclude them from authorship. The authors determined to have COIs did not review or rate the evidence. Because the panel majority was free of COIs, the entire panel voted on the guideline recommendations, with those panel members free of COIs leading recommendation development. This full author panel was solely responsible for decisions concerning the design, analysis, and reporting of the systematic review and subsequent guideline. The development of this guideline follows the methodologies described in the 2017 edition of the AAN's Guideline Development Process Manual.[15]

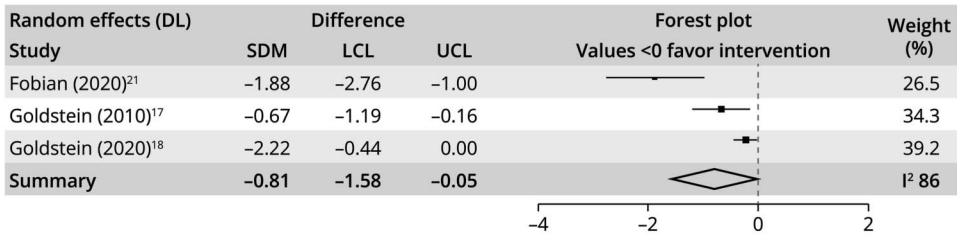
The panel searched the Medline, Embase, PsychINFO, and CINAHL databases for relevant peer-reviewed articles in any language that met inclusion criteria (Figure 1). Each of the 12

Figure 2 Psychological Interventions and Probability of Achieving Freedom From Functional Seizures



DL: DerSimonian-Laird; LCL: lower confidence limit; RR: risk ratio; UCL: upper confidence limit

Figure 3 Psychological Interventions and Functional Seizure Frequency



DL: DerSimonian-Laird; LCL: lower confidence limit; SMD: standardized mean difference; UCL: upper confidence limit

selected articles was rated by 2 panel members using the AAN criteria for classification of therapeutic studies.[15]

A modified form of the Grading of Recommendations Assessment, Development and Evaluation process was used to develop conclusions of the systematic review.[15,16] The panel formulated practice recommendations using a modified Delphi process.

Analysis of Evidence

Table 1 provides a summary of descriptive characteristics of the 12 included studies. Table 2 provides a summary of interventions, measures, and outcomes for each of the included studies. eTable 1 provides details on the risk of bias for each of the 12 included studies.

Psychological Interventions

The psychological interventions studied included 2 functional seizure–specific cognitive behavioral therapies (CBTs),[21-23] neurobehavioral therapy (NBT),[26] Retraining and Control Therapy (ReACT),[20] behavioral therapy,[24] motivational interviewing,[29] group psychoeducation,[19] body-focused group therapy,[27] and psychotherapy with protocolized review of videotaped functional seizures.[17] Psychological interventions typically ran for 3–12 sessions. Long-term outcome data are not available beyond 1 year of follow-up. The applicable population for each of the following conclusions is people with functional seizures.

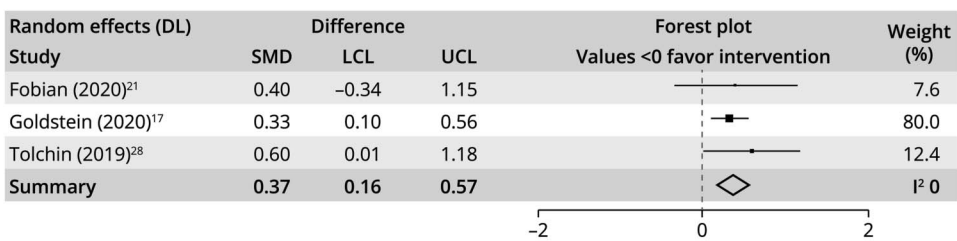
Conclusions

Psychological interventions, compared with standard medical care (SMC), routine clinical care, nondirective supportive therapy, informational interviews, diazepam, or no therapy, possibly increase the probability of achieving freedom from functional seizures during the follow-up period. Based on 7 Class III studies,[17,18,20-22,26-28] the pooled estimate of the risk ratio (RR) is 1.87 for seizure freedom, favoring psychological interventions (95% CI 1.36–2.56, I^2 = 3%) (Figure 2). Our confidence in the estimate is low, anchored by the class of studies. Exclusion of the nonrandomized study[17] did not change the magnitude or significance of the RR.

Psychological interventions, compared with SMC or nondirective supportive therapy, possibly decrease functional seizure frequency at follow-up. Based on 3 Class III studies,[20,21,23] the pooled estimate of the standardized mean difference (SMD) is −0.81, favoring psychological interventions (95% CI −1.58 to −0.05, I^2 = 86%) (Figure 3). Our confidence in the estimate is low, anchored by the class of studies.

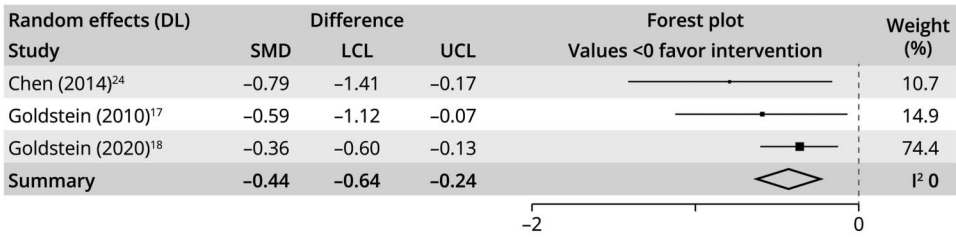
There is insufficient evidence to determine whether psychological interventions, compared with SMC or nondirective supportive therapy, are more or less likely to change severity or bothersomeness of functional seizures. Based on 2 Class III studies,[21,27] the pooled estimate of the SMD is −0.64, favoring

Figure 4 Psychological Interventions and Health-Related Quality of Life



DL: DerSimonian-Laird; LCL: lower confidence limit; SMD: standardized mean difference; UCL: upper confidence limit

Figure 5 Psychological Interventions and Psychosocial Functioning



DL: DerSimonian-Laird; LCL: lower confidence limit; SMD: standardized mean difference; UCL: upper confidence limit

psychological interventions (95% CI −1.41 to 0.13, I^2 = 69%). Our confidence in the estimate is very low, anchored by the class of studies and imprecision.

Because of the heterogeneity of psychological interventions evaluated in our primary analysis, we reran our analysis including only studies evaluating functional seizure–specific CBT,[21,22] which is the only psychological intervention for which multiple studies exist.

Functional seizure–specific CBT, compared with SMC, possibly increases the probability of achieving freedom from functional seizures. Based on 2 Class III studies,[21,22] the pooled estimate of the RR is 1.76, favoring CBT (95% CI 1.10–2.80, I^2 = 0%). Our confidence in the estimate is low, anchored by the class of studies.

There is insufficient evidence to determine whether functional seizure–specific CBT is more or less likely than SMC to result in a change in functional seizure frequency at follow-up. Based on 2 Class III studies,[21,22] the pooled estimate of the SMD is −0.38, favoring CBT. However, the 95% CI is −0.81 to 0.04 (I^2 = 60%). Our confidence in the estimate is very low, anchored by the class of studies and imprecision.

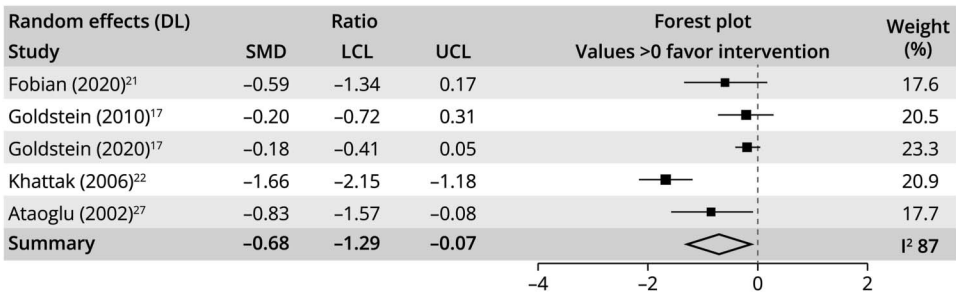
Psychological interventions, compared with SMC, nondirective supportive therapy, or informational interviews, possibly increase health-related quality of life. Based on 3 Class III studies,[20,22,28] the pooled estimate of the SMD is 0.37, favoring psychological interventions (95% CI 0.16–0.57, I^2 = 0%) (Figure 4). Our confidence in the estimate is low, anchored by the class of studies.

Psychological interventions, compared with SMC or no intervention, possibly improve psychosocial functioning. Based on 3 Class III studies,[19,21,22] the pooled estimate of the SMD is −0.44 on the Work and Social Adjustment Scale (WSAS), favoring psychological interventions (95% CI −0.64 to −0.24, I^2 = 0%) (Figure 5). Our confidence in the estimate is low, anchored by the class of studies.

Psychological interventions, compared with routine clinical care, nondirective supportive therapy, SMC, or diazepam, possibly decrease anxiety. Based on 5 Class III studies,[18,20-22,24] the pooled estimate of the SMD is −0.68, favoring psychological interventions (95% CI −1.30 to −0.07, I^2 = 87%) (Figure 6). Our confidence in the estimate is low, anchored by the class of studies.

There is insufficient evidence to determine whether psychological interventions, compared with SMC, routine clinical care, or nondirective supportive therapy, result in a change in depression. Based on 4 Class III studies,[20,21,23,24] the pooled estimate of the SMD is −0.43, favoring psychological

Figure 6 Psychological Interventions and Anxiety



DL: DerSimonian-Laird; LCL: lower confidence limit; SMD: standardized mean difference; UCL: upper confidence limit

interventions (eFigure 1). However, the 95% CI is −0.98 to 0.12 (I^2 = 84%). Our confidence in the estimate is very low, anchored by the class of studies and imprecision.

Because of the heterogeneity of psychological interventions evaluated in our primary analysis, we again reran this analysis including only studies evaluating functional seizure–specific CBT,[21-23] which is the only psychological intervention for which multiple studies exist.

There is insufficient evidence to determine whether functional seizure–specific CBT, compared with SMC, changes health-related quality of life. Based on a single Class III study,[22] the estimated mean difference in health-related quality of life as measured on the EuroQol 5-Dimension 5-Level Visual Analogue Scale is 6.16, favoring CBT (95% CI 1.48–10.84, p = 0.010). Our confidence in the estimate is very low, anchored by the number and class of studies.

Functional seizure–specific CBT, compared with SMC, possibly improves psychosocial functioning (decreases WSAS scores). Based on 2 Class III studies,[21,22] the pooled estimate of the SMD is −0.40, favoring CBT (95% CI −0.61 to −0.19, I^2 = 0%). Our confidence in the estimate is low, anchored by the class of studies.

Functional seizure–specific CBT, compared with SMC, possibly causes no change in anxiety. Based on 2 Class III studies,[21,22] the pooled estimate of the SMD is −0.19, favoring CBT. However, the 95% CI is −0.40 to 0.02 (I^2 = 0%). Our confidence in the estimate is low, anchored by the class of studies and imprecision.

Pharmacologic Interventions

Regarding pharmacologic interventions, 2 studies evaluated the use of sertraline[25,26] and 1 study examined the use of diazepam.[18] The applicable population for each of the following conclusions is people with functional seizures.

Conclusions

There is insufficient evidence to determine whether sertraline, compared with placebo or routine clinical care, changes the probability of achieving freedom from functional seizures. Based on 1 Class II study[25] and 1 Class III study,[26] the pooled estimate of the RR is 2.34, favoring sertraline (95% CI 0.34–16.09, I^2 = 49%). Our confidence in the estimate is very low, anchored by imprecision.

There is insufficient evidence to determine whether there is a relative change in seizure rates between those taking sertraline and those taking placebo (1 Class II study, RR 0.51, 95% CI 0.25–1.05, p = 0.29).[25] Our confidence in the estimate is very low, anchored by the number and class of studies and downgraded for imprecision.

There is insufficient evidence to determine whether diazepam, compared with paradoxical therapy, changes the probability of achieving freedom from functional seizures (1 Class III study, t = 2.27, p = 0.034).[18] Our confidence in the estimate is very low, anchored by the number and class of studies.

There is insufficient evidence to determine whether sertraline is more or less likely than placebo to improve health-related quality of life. A single Class II study[25] found a nonsignificant raw mean difference (RMD) of 9.80 in health-related quality of life, as measured by the Quality of Life in Epilepsy-31, favoring sertraline (95% CI −9.17 to 28.77, p = 0.311). Our confidence in the estimate is very low, anchored by the number and class of studies and downgraded for imprecision.

There is insufficient evidence to determine whether sertraline, compared with placebo, changes psychosocial functioning. A single Class II study[25] found a nonsignificant RMD of −2.00 in psychosocial functioning, as measured on the Longitudinal Interval Follow-up Evaluation–Range of Functioning Tool, favoring sertraline (95% CI −5.22 to 1.22, p = 0.223). Our confidence in the estimate is very low, anchored by the number and class of studies and downgraded for imprecision.

There is insufficient evidence to determine whether sertraline is more or less likely than placebo to improve anxiety. A single Class II study[25] found a nonsignificant RMD of −3.10 in anxiety, as measured on the Davidson Trauma Scale, favoring sertraline (95% CI −32.68 to 26.48, p = 0.837). Our confidence in the estimate is very low, anchored by the number and class of studies and downgraded for imprecision.

There is insufficient evidence to determine whether sertraline is more or less likely than placebo to improve depression. A single Class II study[25] found a nonsignificant RMD of −1.70 in depression, as measured on the Hamilton Rating Scale for Depression, favoring sertraline (95% CI −8.43 to 5.03, p = 0.621). Our confidence in the estimate is very low, anchored by the number and class of studies and downgraded for imprecision.

There is insufficient evidence to determine whether diazepam, compared with paradoxical therapy, changes anxiety. A single Class III study[18] found an RMD of −3.73 in anxiety, as measured by the Hamilton Rating Scale for Anxiety, favoring paradoxical therapy (95% CI of −6.96 to −0.50, p = 0.024). Our confidence in the estimate is very low, anchored by the number and class of studies.

Practice Recommendations

Diagnosis of Functional Seizures

Recommendation 1 Rationale

Historically, there have been significant delays in the diagnosis of functional seizures, with the diagnosis being delayed for an average of 7–8 years after symptom onset.[30,31] Prompt and accurate diagnosis of functional seizures is essential for

effective treatment and avoidance of iatrogenesis based on misdiagnoses. A detailed clinical history and careful analysis of the seizure semiology, including characteristics positively associated with functional seizures, contribute to the accurate diagnosis of functional seizures.[32-37] Historical and semiological information obtained from both patients and witnesses can improve the accuracy of the diagnosis.[38] When feasible, a brief physical examination during the ictal event can contribute to the accurate diagnosis of functional seizures and epileptic seizures.[32,39-42] Serum prolactin, lactate, and creatine kinase may be more elevated after a bilateral tonic-clonic epileptic seizure than after other episodes involving transient loss of consciousness, but each of these laboratory tests has been associated with significant rates of false-positive and false-negative results when used to differentiate between functional seizures, epileptic seizures, and syncope.[43-47]

In combination with clinical history and semiology, video-EEG (VEEG) assessment of all typical types of episodes is the gold standard for diagnosing definite or "documented" functional seizures and differentiating them from epileptic seizures or other physiologic events.[48] VEEG can be obtained in an epilepsy monitoring unit, during 30–60-minute EEGs in the inpatient or outpatient setting, through continuous inpatient EEG monitoring, or using home-video EEG.[49] When functional seizures present with a semiology resembling syncope, additional long-term ECG monitoring and tilt-table testing may help to differentiate functional seizures from syncope.[50] VEEG is not available in all practice settings and may not be feasible for patients with infrequent seizure-like events.[14] When VEEG is not feasible, a diagnosis of probable functional seizures may be based on review of history, semiology, and interictal EEG.[48] Similarly, when VEEG capture of a typical event is not feasible, a diagnosis of clinically established functional seizures can be based on history, semiology, ambulatory EEG capture of a typical event (without video), and separate video recording of a typical event.[48] Videos of seizure-like episodes captured on smartphones and reviewed by a neurologist can facilitate the evaluation of seizure semiology and allow accurate diagnosis in most of the cases.[51] Individuals with functional seizures frequently experience multiple functional neurologic symptoms.[52,53] Clinicians with greater experience in the diagnosis of seizure disorders can more accurately diagnose functional seizures.[54-57]

Recommendation 1 Statements

1A. Clinicians *should* include functional seizures in the differential diagnosis and in the initial workup of patients presenting with seizure-like or syncope-like episodes to make a prompt and accurate diagnosis. (Level B)

1B. When evaluating patients with seizure-like or syncope-like episodes, clinicians *should* seek historical and semiological information from both patients and witnesses when available to support a prompt and accurate diagnosis. (Level B)

1C. When acutely evaluating patients with prolonged seizure-like episodes in emergency settings, clinicians *should* perform a brief ictal physical examination to support a prompt and accurate diagnosis. (Level B)

1D. When diagnostic ambiguity exists between epileptic and functional seizures after review of historical and semiological features including available video and EEG data, clinicians *may* obtain VEEG of typical seizure-like episodes where feasible to confirm the diagnosis with the greatest possible level of clinical certainty. (Level C)

1E. When diagnostic ambiguity exists between syncope and functional seizures after review of historical and semiological features, clinicians *should* evaluate blood pressure and cardiac rhythm during episodes using ECG monitoring and/or tilt-table testing where available to confirm the diagnosis with the greatest possible level of clinical certainty. (Level B)

1F. Where VEEG, ECG, and/or tilt-table capture of typical seizure-like or syncope-like episodes are not feasible, clinicians *should* use ambulatory EEG, interictal EEG, interictal ECG if available, smartphone video of typical seizure-like episodes, and historical and semiological features to make a diagnosis with the greatest possible level of clinical certainty. (Level B)

1G. When diagnosing a patient with functional seizures, clinicians *should* screen and evaluate for other functional neurologic symptoms, to support prompt treatment. (Level B)

1H. When diagnosis or management of functional or epileptic seizures is beyond the clinician's scope of practice or expertise, they *should* refer patients with seizures to an appropriate specialist to support a prompt and accurate diagnosis. (Level B)

Assessment of Psychiatric Comorbidities and Epilepsy

Recommendation 2 Rationale

A lifetime history of psychiatric disorders, including mood disorders, anxiety disorders, and posttraumatic stress disorder (PTSD), co-occurs at a high frequency with functional seizures.[29,58] Substance use disorders can also co-occur at elevated rates among people with functional seizures.[59,60,e1] Abuse, neglect, and other adverse life experiences are 3–5 times more common among individuals with functional neurologic disorders than in the general population and twice as common as among individuals with other psychiatric disorders.[4,e2] Co-occurring psychiatric disorders can make it more difficult for some individuals to engage in psychotherapeutic treatment, with a greater number and severity of psychiatric symptoms associated with higher rates of treatment nonadherence.[e3,e4] Adherence to psychotherapeutic treatment is associated with better outcomes for functional seizure frequency and quality of life.[29,e4] Accordingly, treatment of co-occurring psychiatric disorders may also facilitate psychotherapeutic treatment of functional seizures.

Lifestyle modifications such as diet, exercise, and meditation can improve quality of life in individuals with common co-

occurring psychiatric disorders such as mood disorders, anxiety disorders, and PTSD.[e5-e7] Appropriate psychotherapeutic treatments can improve quality of life and psychosocial functioning among individuals with co-occurring psychiatric disorders, including mood, anxiety, and personality disorders.[e8-e10] Psychopharmaceuticals such as selective serotonin reuptake inhibitors and serotonin and norepinephrine reuptake inhibitors are also effective in treating psychiatric disorders, including mood disorders, anxiety disorders, and PTSD.[e11,e12] Therapeutic neuromodulation is also effective in treating common co-occurring psychiatric disorders, including major depression.[e13-e16]

Recommendation 2 Statements

2A. Clinicians *should* evaluate patients diagnosed with functional seizures for co-occurring psychiatric disorders (including affective, trauma-related, personality, and substance use disorders) to facilitate treatment of both co-occurring disorders and functional seizures. (Level B)

2B. Clinicians *should* offer patients diagnosed with functional seizures and active co-occurring psychiatric disorders, who do not already receive mental health care, a referral to a mental health specialist for appropriate evidence-based treatment of their co-occurring psychiatric disorders. (Level B)

Recommendation 3 Rationale

Functional seizures may co-occur in up to 12% of people with epilepsy, and epilepsy may co-occur in up to 20% of adults with functional seizures, 30%–40% of children with functional seizures, and up to 50% of individuals with intellectual disabilities and functional seizures.[e17,e18] Antiseizure medications improve epileptic seizure control, mortality rates, and quality of life among individuals with epilepsy.[e19-e21] Treating co-occurring epileptic and functional seizures requires clinicians and patients to accurately identify and differentiate the different seizure types so that appropriate treatments can be titrated accordingly. VEEG assessment of all typical types of episodes in combination with clinical history and seizure semiology is the gold standard for diagnosing functional seizures and differentiating them from epileptic seizures or other physiologic events.[48]

Recommendation 3 Statements

3A. Clinicians *should* evaluate patients diagnosed with functional seizures for co-occurring epilepsy to deliver appropriate treatment. (Level B)

3B. Clinicians *should* use history, semiology, and—where feasible—VEEG to help patients with co-occurring functional and epileptic seizures to accurately identify and distinguish different seizure types to deliver appropriate treatment. (Level B)

3C. Clinicians *should* counsel patients with functional seizures and co-occurring epilepsy about the risks and benefits of antiseizure medications for the treatment of epileptic seizures, as well as their lack of efficacy in the treatment of functional seizures. (Level B)

3D. Clinicians *should* prescribe appropriate antiseizure treatments for epileptic seizures for patients with functional seizures and co-occurring epilepsy. (Level B)

General Principles of Management

Recommendation 4 Rationale

Functional seizures and other forms of functional neurologic disorder are diagnosed based on history, physical examination, and semiology, as well as evaluation of alternative diagnoses and comorbidities as clinically indicated.[33,48,e22] Psychological interventions may be effective in improving seizure frequency and quality of life. Mental health specialists and other clinicians can be trained in providing these psychological interventions. Neurologists can also facilitate treatment of functional seizures through effective communication of the diagnosis and other approaches to promote engagement (e.g., use of motivational interviewing strategies).[29,e23] Patients with functional seizures often have comorbidities and other neurologic symptoms, some of which can develop after the diagnosis of functional seizures.[e24]

Some common clinical practices have been shown to harm patients with functional seizures through stigmatization, humiliation, or inflicting pain.[e25] Patients with functional seizures are entitled to the same rights as other patients, including dignity, clear and respectful communication, and protection from harm. Patients with functional seizures may have different illness experiences or different understandings of the diagnosis depending on cultural context.[e26-e28]

The provision of a clear explanation of the diagnosis and treatment plan is an essential platform for further treatment. Development of a seizure action plan can provide increased control and decreased vulnerability for patients and caregivers.[e29] Many local and national driving restrictions relating to seizures and/or episodic alterations of awareness may apply to patients with functional seizures.[e30] Functional seizures frequently interfere with employment, schooling, and other social functions.[23,e31-e33] Effective patient self-management has been linked to improvements in health outcomes for a number of chronic conditions.[e34-e37] Clinicians can support self-management and self-efficacy by directing patients to educational and support resources. For patients with chronic illnesses, continuity of care is associated with increased patient satisfaction and adherence with treatment plans.[e38-e40]

Recommendation 4 Statements

4A. Neurologists and mental health clinicians *should* collaborate in the assessment and treatment of functional seizures to facilitate evidence-based treatment. (Level B)

4B. Clinicians *should* adhere to universal standards of care for patients, including speaking respectfully, refraining from unnecessary harm, and avoiding stigmatizing behavior to prevent harm to patients. (Level B)

4C. Clinicians *should* provide a specific diagnostic label and the rationale for the diagnosis to patients and caregivers in

a manner that is clear, empathetic, supportive, and takes into account the patient's cultural context to facilitate patient understanding of the diagnosis and treatment. (Level B)

4D. Clinicians *should* engage in shared decision making regarding the treatment plan, taking into account the patient's understanding of the diagnosis, to facilitate patient engagement with treatment. (Level B)

4E. Clinicians *should* counsel patients and caregivers on how to manage an acute functional seizure episode, to enhance patients' control and decrease vulnerability. (Level B)

4F. Clinicians *should* ask patients of driving age about driving and provide advice appropriate to the regulations of the region of practice to facilitate adherence to relevant regulations. (Level B)

4G. Clinicians *should* ask about the impact of functional seizures on occupational and social functioning to assess patients' psychosocial needs. (Level B)

4H. Clinicians *should* provide or direct the patient and caregivers to resources for learning and support, such as patient and professional advocacy organizations, to promote self-management and self-efficacy. (Level B)

4I. Clinicians *should* provide continuity of care to individuals diagnosed with functional seizures to facilitate treatment and increase patient satisfaction. (Level B)

Psychological Interventions

Recommendation 5 Rationale

Psychological interventions in general can be helpful in possibly achieving seizure freedom, reducing functional seizure frequency, reducing anxiety, and improving health-related quality of life and psychosocial functioning in individuals with functional seizures. NBT, paradoxical therapy, behavioral therapy, psychoeducation, ReACT, and motivational interviewing in combination with psychotherapy have been studied in the treatment of functional seizures, and several studies have examined functional seizure–specific CBT. Studies of NBT, paradoxical therapy, CBT, and motivational interviewing in combination with psychotherapy suggest that these psychological interventions possibly increase the probability of achieving freedom from functional seizures. Studies of ReACT and CBT suggest that these psychological interventions possibly decrease functional seizure frequency. Studies of ReACT, CBT, and motivational interviewing in combination with psychotherapy suggest that these psychological interventions possibly decrease anxiety and increase health-related quality of life. Studies of group psychoeducation and CBT suggest that these psychological interventions possibly improve psychosocial functioning. Studies of CBT suggest that it possibly increases the probability of achieving freedom from functional seizures and possibly improves psychosocial functioning.

Psychological interventions are generally safe and well tolerated.[e41,e42] Offering available effective and safe treatments is critical to the process of shared decision making between clinicians and patients. The success of psychological interventions depends, in part, on the support and participation of family, particularly in the treatment of children.[e43,e44] The involvement of caregivers or other members of the social support system may also contribute to psychological treatment success for adults.[e45,e46] Therefore, psychological interventions may differently involve family, caregivers, or others in the patient's social support network, depending on the patient's circumstances.

Recommendation 5 Statements

5A. When psychological interventions for the treatment of functional seizures are indicated and accessible, clinicians *should* counsel patients regarding the potential benefits and risks of such interventions to facilitate shared decision making. (Level B)

5B. When caring for patients with functional seizures, clinicians whose scope of practice does not include counseling patients regarding the possible benefits and demands of psychological interventions *should* refer patients to a clinician knowledgeable about modalities of psychological treatment to facilitate evidence-based treatment. (Level B)

5C. Clinicians *should* refer interested and appropriate patients diagnosed with functional seizures to psychological interventions for the treatment of functional seizures to improve frequency of functional seizures, health-related quality of life, and psychosocial functioning. (Level B)

5D. Clinicians *should*, with patient permission, involve family, caregivers, or others in the social support network in the psychological treatment of adults with functional seizures to improve treatment outcomes. (Level B)

5E. Clinicians *should* involve family in the psychological treatment of children with functional seizures to improve treatment outcomes. (Level B)

Pharmacologic Interventions

Recommendation 6 Rationale

Many patients with functional seizures are initially misdiagnosed with epilepsy and treated with antiseizure medications before the correct diagnosis is made.[30] Even after the diagnosis of functional seizures, many patients are prescribed antiseizure medications and/or psychopharmacologic interventions, including benzodiazepines,[e47] despite insufficient evidence of benefit. Although antiseizure medications can be effective in treating co-occurring epilepsy and psychopharmacologic medications can be effective in treating co-occurring psychiatric disorders, there is a lack of evidence of efficacy of either type of medication in the direct treatment of functional seizures.

While benzodiazepines can provide anxiolysis[e48] and can sometimes abort prolonged functional seizures in the short term, they are habit forming,[e49] can cause cognitive impairment,[e50] and increase risk of motor vehicle accidents in the long term.[e51] In the acute setting, administration of benzodiazepines for treatment of prolonged functional seizures can result in intubation and iatrogenic harm.[e52,e53] While

antiseizure medications may provide reassurance to clinicians, patients, or caregivers who are uncertain of the diagnosis of functional seizures, these medications cause adverse effects ranging from more common but mild effects such as fatigue and dizziness, to severe and even life-threatening effects such as Stevens-Johnson syndrome, aplastic anemia, and hepatic failure.[e54] In patients with functional seizures without co-occurring epilepsy who were previously treated with antiseizure medications, immediate tapering of antiseizure medications leads to improved outcomes compared with delayed withdrawal.[e55] Besides epilepsy, other indications for antiseizure medications, including potentially benzodiazepines, may include but are not limited to mood disorders, anxiety disorders, migraine, or neuropathic pain.

Recommendation 6 Statements

6A. Clinicians *should* counsel patients with functional seizures without co-occurring epilepsy or another indication for benzodiazepines regarding the potential risks and lack of evidence of benefit for functional seizures associated with benzodiazepines. (Level B)

6B. Clinicians *should not* prescribe benzodiazepines for acute abortive treatment in patients with functional seizures without co-occurring epilepsy, anxiety disorders, or another indication, to reduce the risk of adverse effects. (Level B)

6C. Clinicians *should* counsel patients with functional seizures and without co-occurring epilepsy or another indication for an antiseizure medication about the lack of benefit and the potential risks of taking antiseizure medications for the treatment of functional seizures. (Level B)

6D. Clinicians *should not* prescribe antiseizure medications to patients with functional seizures without co-occurring epilepsy or another indication for antiseizure medications, to reduce the risk of adverse effects. (Level B)

6E. Clinicians *should* taper off antiseizure medications for patients with functional seizures and without another indication for antiseizure medications to reduce the risk of adverse effects. (Level B)

Suggestions for Future Research

The systematic review of evidence relating to the management of functional seizures identified several clinically important areas with limited or no evidence, where future research may be especially impactful. The full guideline (eAppendix 1) includes suggestions for future research relating to diagnosis, pathophysiology, psychological interventions, special populations, psychopharmacologic interventions, neurostimulation, and implementation science.

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