Seizures, Driver Licensure, and Medical Reporting Update

An AAN Position Statement

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Neurology® 2025;104:e213459. doi:10.1212/WNL.000000000213459

Abstract

This consensus position statement of the American Academy of Neurology, American Epilepsy Society, and Epilepsy Foundation of America updates prior 1994 and 2007 position statements on seizures, driver licensure, and medical reporting. Key consensus positions include the following: (1) in the United States, national driving standards promulgated through a system such as the Uniform Law Commission would reduce confusion and improve adherence with state driving standards; (2) state licensing criteria for medical conditions should be promulgated by regulations and guidelines based on enabling legislation rather than in statutes themselves and should be developed by medical advisory boards working in collaboration with departments of motor vehicles; (3) licensing criteria should be equitable, nondiscriminatory, objective, and compatible with comparable risks in other populations; (4) a minimum seizure-free interval of 3 months should ordinarily be required before driving in all cases and should be extended in individual cases based on review of favorable and unfavorable features by medical advisory boards; (5) individuals with exclusively provoked seizures attributable to provoking factors that are unlikely to reoccur in the future may not require a seizurefree interval before resuming driving; (6) individuals with previously well-controlled epilepsy who experience seizures due to short-term interruptions of antiseizure medications in the setting of hospitalization or practitioner-directed medication-titration may not require a seizure-free interval before driving once previously effective levels of antiseizure medications have been resumed; (7) patients and practitioners should pause driving during tapering and following discontinuation of an antiseizure medication if another such medication is not introduced; (8) individuals whose cognition or coordination is impaired due to medications used to prevent seizures should refrain from driving; (9) health care practitioners should be allowed but not mandated to report drivers who pose an elevated risk; but (10) neither a decision to report a patient suspected of being at elevated risk nor a decision declining to report a patient suspected of being at elevated risk should be subject to legal liability; (11) nations, states, and municipalities should provide alternative methods of transportation and accommodations for individuals whose driving privileges are restricted due to medical conditions.

Introduction

In 1991, representatives from the American Academy of Neurology (AAN), the American Epilepsy Society (AES), and the Epilepsy Foundation of America (EFA) met in a consensus conference on appropriate criteria for driver licensing of persons with epilepsy. The consensus positions developed in that conference served as the basis for model regulations and sample statutory provisions and were published in 1994.¹ The key consensus positions included the following: (1) medical advisory boards should set medical criteria for driver licensure; (2)



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This statement was approved by the Ethics, Law, and Humanities Committee, a joint committee of the American Academy of Neurology (AAN), American Neurological Association (ANA), and Child Neurology Society (CNS), on June 10, 2024. This statement was approved by the boards of directors of the AAN on July 31, 2024; AES on August 27, 2024; CNS on August 29, 2024; EFA on September 13, 2024; and ANA on October 23, 2024.

Glossary

AAN = Academy of Neurology; **AES** = American Epilepsy Society; **DMV** = Department of Motor Vehicles; **EFA** = Epilepsy Foundation of America; **MVA** = motor vehicle accident.

licensing criteria should appear in regulations and guidelines rather than in statute; (3) the licensing process should allow individual consideration of driving risks; (4) licensing criteria should be fair, nondiscriminatory, and based on comparable risks in other populations; (5) a minimum seizure-free interval of 3 months should be used while being subject to modification by individualized consideration of favorable and unfavorable factors; (6) practitioners should be allowed but not mandated to report unsafe drivers; and (7) practitioners should have legal immunity whether they report these drivers. The consensus positions were reviewed by the AAN in 2007 and largely reaffirmed with some important additions, including a new recommendation that national and state governments should support alternative transportation for those restricted from driving for medical reasons.²

In 2023, representatives from the AAN, AES, and EFA reconvened to review the 1991 and 2007 position statements, to perform a targeted review of evidence relating to driving safety in the setting of seizures, and to develop a revised consensus position statement to update the position statements published in 1994 and 2007.

Although studies relating to driving safety in the setting of seizures remain limited, published peer-reviewed evidence does support the following conclusions:

- 1. There is a modest but real increased risk of motor vehicle accidents (MVAs) associated with epileptic seizures,^{3,4} and increased seizure frequency is associated with higher risk of MVAs.⁵
- 2. Risk of fatal MVAs associated with epileptic seizures is not higher than in the general population of drivers and is significantly lower than the risk of fatal MVAs associated with alcohol use disorder or young drivers.^{6,7}
- 3. Risk of recurrent seizures and MVAs for individuals declines with longer seizure-free intervals, with progressively reduced risk of recurrent seizures and MVAs after 6 and 12 months of seizure freedom (Tables 1 and 2).⁸⁻¹⁰
- 4. At a population level, universal legal requirements for seizure-free intervals longer than 3 months do not seem to reduce MVAs or fatalities, although individualized restrictions longer than 3 months may be appropriate based on individual clinical factors (e.g., adherence and treatment resistance).¹¹
- 5. Many drivers with seizures disregard legal restrictions on driving,^{2,12,13} and regulatory compliance may be increased by prescribing individualized and less onerous seizure-free intervals.¹⁴

- 6. In 2003, Maryland implemented the recommended minimum 3-month seizure-free interval with individualized review and modification by a medical advisory board, with 2 MVAs associated with seizures reported over the subsequent 7 years.¹⁵
- 7. Driving is important for supporting work and social activities and is a central factor in quality of life in epilepsy.¹⁶
- 8. Mandatory reporting by health care practitioners does not decrease MVAs but does increase likelihood of unlicensed driving and withholding information from practitioners.^{12,17}

Based on these findings, prior consensus statements, current expert opinion, and the feedback of health care practitioners and individuals with epilepsy, the AAN, AES, and EFA offer the following revised consensus position statement on driving and seizures. All consensus positions are based on the unanimous agreement of the author panel representing the AAN, AES, and EFA, followed by review and approval by all 3 organizations. This position statement is offered in hope of improving the public process of management of a complex societal, governmental, medical, and personal issue.

For the purposes of this position statement, the term "health care practitioner" refers to physicians and advanced practice providers.

Driver Licensing Determinations

Driver licensing decisions should be made by appropriate governmental regulatory bodies, rather than by treating practitioners. In the United States, recommended national driving standards promulgated through a system such as the Uniform Law Commission would reduce confusion and improve adherence with driving standards among both individuals with seizures and health care practitioners. Such national standards should include individualized assessments of cases by medical advisory boards and adhere to evidencebased recommendations such as those described here. In the absence of national driving standards, states should enact enabling legislation allowing the Departments of Motor Vehicles (DMVs), medical advisory boards, and consultants to establish driver-licensing and appeals processes that include individualized assessments by medical advisory boards and adhere to evidence-based recommendations. Such legislation should protect practitioners involved in the licensing process who are acting in good faith from liability.

Table 1	Risk of Seizure-Recurrence Over 12 Months
	Following Seizure-Free Intervals of Varying
	Durations ¹⁰

	Not remote	Remote
Cause of seizures	symptomatic, % (95% Cl)	symptomatic, % (95% Cl)
6 mo seizure freedom	15 (12–19)	20 (10–30)
12 mo seizure freedom	8 (5–11)	13 (4–22)
18 mo seizure freedom	11 (7–14)	9 (1–17)

Licensing criteria for each medical condition should appear in regulations and guidelines rather than being prescribed by statute. Such criteria should be developed by a medical advisory board including health care practitioners with expertise in the particular medical condition, working in collaboration with the DMV.

Licensing criteria should be equitable, nondiscriminatory, objective, and compatible with comparable risks in other populations.

We note that there have been historical instances in which state statutes have been enacted or amended based on a single tragic accident or event.¹⁸ In general, policies and regulations related to driving and seizures should not be based on single incidents. Rather policies and regulations should take into account relevant research, consensus statements such as this one, and individualized assessments with input from medical advisory boards wherever possible. We believe that individualized assessments by medical advisory boards and treating practitioners are vital to mitigate public safety risks while preserving the rights and liberties of individuals.

The treating practitioner should be responsible for reporting the pertinent medical facts on forms provided by the DMV. These forms should be detailed and precise and should offer an opportunity for the treating practitioner to make a recommendation about whether the patient should be licensed and to give narrative commentary. However, the practitioner should not be required to offer any recommendation or commentary. When treating practitioners do submit a recommendation, the ultimate responsibility and final decision should still reside with the medical advisory board.

Table 2	Odds Ratios for Motor Vehicle Accidents After
	Seizure-Free Intervals of Varying Durations ⁹

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Duration of seizure-freedom	Motor vehicle accident, OR (95% Cl)
≥ 3 mo	0.428 (0.15–1.4)
≥ 6 mo	0.147 (0.031–0.691)
≥ 12 mo	0.075 (0.012–0.47)

A road test should not be required for determining a person's fitness to drive due to seizures unless other relevant medical conditions or symptoms such as cognitive impairment are in question.

Seizure-Free Intervals

A minimum seizure-free interval should be prescribed for individuals seeking a new license and for previously licensed individuals resuming driving after a seizure. The seizure-free interval should apply after the first life-time seizure and after recurrent seizures. The seizure-free interval should be considered for individuals who have seizures even when those individuals do not meet criteria for epilepsy, for example, individuals who have had a single unprovoked seizure or individuals who are having recurrent seizures caused by a recurring provoking factor such as alcohol withdrawal. Individuals with exclusively provoked seizures attributable to provoking factors that are unlikely to recur in the future (e.g., a major systemic infection with high fever) may not require a seizure-free interval before resumption of driving. Because they are likely to recur in future, factors such as sleep deprivation, fatigue, high levels of stress, or alcohol withdrawal preceding a seizure should not be a cause for exception to the requirement of a seizure-free interval before the resumption of driving. A medical advisory board, with the input of treating clinicians, can make an individualized assessment as to whether a putative provoking factor adequately explains a specific seizure and if so whether the provoking factor is likely to recur in the future.

Individuals with previously well controlled epilepsy may experience seizures due to short-term interruptions in therapy occurring during hospitalizations or practitioner-directed changes in treatment (for example, during a stay in a hospital's epilepsy monitoring unit). Individuals in such cases may not require a seizure-free interval after restarting their previously effective medication levels before resumption of driving.

Three months of seizure freedom is preferred as a minimum requirement, starting from the date of the most recent seizure. Evidence suggests that universal requirements for seizure-free intervals longer than 3 months do not reduce MVAs or fatalities.¹¹ The 3-month seizure-free minimum interval may be extended based on individualized consideration of favorable and unfavorable factors, ideally assessed by a medical advisory board with input from treating practitioners. Individualized restrictions longer than 3 months may be appropriate based on individual clinical factors such as treatment resistance or nonadherence with medications, as discussed in the following section. We recognize that many states require different seizure-free intervals ranging from 3 to 18 months, and we recommend individualization of these intervals whenever possible, ideally based on assessment by a medical advisory board with input from treating practitioners. Practitioners and individuals with seizures should adhere to state laws and regulations even when those laws and regulations conflict with

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evidence-based recommendations such as those described here and may consider advocating for legal reform.

Seizure-free intervals, with individualized assessment of favorable and unfavorable modifying factors, should be considered after each seizure, and not only after the first seizure of life.

Factors Affecting the Seizure-Free Interval

The following modifying factors may be considered by a medical review board when determining the seizure-free period required for resumption of driving in individual cases.

Favorable Factors

- 1. Seizures during practitioner-directed medication changes⁹
- 2. Focal seizures without impaired awareness (e.g., focal aware seizures) that do not interfere with motor control¹⁹
- Established pattern of seizures occurring exclusively during sleep (sometimes referred to "nocturnal seizures")²⁰
- 4. Seizures secondary to provoking factors that are unlikely to recur (such as metabolic, toxic, or infectious conditions, or other acute illnesses).

Auras and seizures occurring during sleep deprivation are no longer considered as reliable favorable factors as they were in the past, given conflicting evidence of their benefit in averting MVAs.^{8,9,21,22}

Unfavorable Factors

- 1. Unambiguous nonadherence with medications or medical visits^{19,23}
- 2. Seizures related to substance use disorder²⁴
- 3. Prior crashes due to seizures
- Prior record of MVAs or violations of driving regulations (if driving record is available)⁹
- 5. Increasing number of seizures in the recent past from prior baseline
- 6. Seizures refractory to multiple antiseizure treatments¹⁹
- 7. Frequent seizures after a seizure-free period
- 8. Individual is having recurrent seizures of which they are unaware
- Structural brain lesion (e.g., stroke, cortical dysplasia, or tumor) or a brain disease likely to worsen over time (e.g., Alzheimer disease or malignancy).¹⁹

Antiseizure Medications and Medical Cannabis

Patients and practitioners should also consider limiting driving during tapering and following discontinuation of antiseizure medications if another such medication is not introduced.^{25,26}

Individuals whose cognition or coordination is impaired due to medications used to prevent seizures should refrain from driving. This includes medical cannabis (where legally permitted). Such medications are not exempt from legal restrictions simply because they are being used to treat epilepsy. It may be appropriate to use field sobriety tests to ascertain whether a patient who has used such medications is impaired and unable to drive. Patients and clinicians should be aware that laboratory tests for metabolites of cannabidiol or medical cannabis may remain positive for days after use and should consider legal ramifications of their use. There is robust high-quality evidence for the efficacy of a pharmaceutical formulation of purified cannabidiol in the treatment of certain types of refractory epilepsy, and this has led to the availability of the Food and Drug Administration-approved pharmaceutical grade cannabidiol with a prescription under the supervision of a physician. Robust scientific evidence for the use of cannabis itself in the treatment of epilepsy is limited.²⁷

Reporting

Patients with seizures should be responsible for self-reporting the condition to the DMV when initially diagnosed as well as on the recurrence of seizures. This requirement should apply even between license applications and renewals. Individuals should be informed that if they experience a seizure they should cease driving, consult their practitioners, and promptly notify the DMV. The obligation to self-report should be stated in writing on the license application and renewal forms.

Practitioners should counsel patients to follow legal restrictions on driving in the setting of seizures and to comply with rules requiring self-reporting in the patient's state of licensure. Practitioners should assess patients with seizures for driving safety, optimize treatment to control seizures, and counsel these patients about the risks to themselves and others associated with driving. Patient-practitioner conversations relating to driving should be documented in the medical record. Practitioners may direct patients to resources (e.g., DMV and Epilepsy Foundation website) where they can obtain information on legal restrictions on driving, self-reporting, and other issues relating to driving and seizures. If a practitioner believes the patient has not self-reported and is endangering the public by driving, the practitioner should be legally authorized to report the patient, and immunized from liability for doing so, but should not be mandated to report or be exposed to liability for failing to do so. Practitioners should inform patients before reporting and should document such interactions in the patient's medical record.

Legal mandates requiring practitioners to report patients with seizures to licensing authorities have been controversial.²⁸ Concerns about public safety are offset by concerns about breaching medical confidentiality, thereby undermining the patient-practitioner relationship, and discouraging full disclosure of medical information by patients to their clinicians.

Comparisons of matched populations with epilepsy who are and are not subject to mandatory reporting suggest that mandatory reporting by practitioners does not decrease the risk of MVAs but does increase the likelihood of unlicensed driving.^{12,17} In addition, more patients in areas requiring mandatory reporting by practitioners admit to withholding medical information from their practitioners than do patients in jurisdictions without mandatory reporting.^{2,12}

Similar studies of other medical conditions potentially affecting driving support the conclusion that mandatory reporting by practitioners is ineffective in reducing MVAs and undermines the patient-practitioner relationship. A Canadian study found that mandatory reporting of patients believed to be at risk of MVAs due to cardiac disease has "negligible impact" on deaths or serious injury.²⁹ An Australian Survey found that a significant minority of drivers will lie or "doctor-shop" to avoid mandatory reporting and that self-reporting by unsafe drivers with education is potentially more effective than mandatory reporting in identifying unsafe drivers.³⁰ A study of mandatory reporting among older patients found no correlation between mandatory reporting laws and MVA-related hospitalizations.³¹

Professional medical organizations such as the American Medical Association and the American College of Emergency Physicians recommend that practitioners make individualized assessments about risk to the patient's and public's safety, rather than mandatory reporting of entire classes or diagnoses, except where compelling evidence exists for a public benefit of such categorical reporting.^{32,33} Individualized assessments should balance dual responsibilities to protect public safety and to promote the welfare and confidentiality of the individual patient.³²

For these reasons, we recommend that practitioners not be *mandated* to report seizure activity. We do recommend that practitioners be *permitted* to report seizures to licensing authorities, especially in cases where they have reason to believe that a patient is engaging in unsafe driving practices against medical advice. We recommend that practitioners exercising their clinical judgement in good faith should be shielded from legal liability for either reporting or not reporting seizures or unsafe driving practices. In accordance with AAN quality measures, we recommend that practitioners counsel patients about state regulations regarding driving with seizures and document these conversations in the medical record.

Case Review

In circumstances where the state requires individual drivers to report seizures to the DMV, requires regular license renewals, and assesses during the license renewal process whether the licensee has had lapses of consciousness or loss of motor control since the prior renewal, a periodic case review may not be necessary. In such circumstances, applicants may be discharged from the periodic case review. However, there should also be a mechanism by which the DMV may require an individual to undergo more frequent reevaluation if the practitioner or medical advisory board recommends it because of special circumstances.

Practitioner Immunity

To protect the practitioner-patient relationship, practitioners should be immunized from liability for deciding not to report a patient to the DMV, if in their best judgment, there is no indication to do so. In addition, practitioners should have immunity for reporting or not reporting patients who have seizures or other episodes involving loss of consciousness or bodily control. The immunity clause should also cover the contents of the report and should prohibit the report from being used in other legal proceedings.

Medical Advisory Boards

A medical advisory board or a similar body should be established in every state. At least 1 member of the board should be a health care practitioner with expertise and experience in treating epilepsy and episodic disorders of consciousness and motor function. Boards should consider consulting with individuals or organizations representing the interests or rights of individuals with epilepsy and other disabilities.

The medical advisory board should promulgate guidelines and implement policies relating to medical illnesses and driving. We recommend that medical advisory boards also assist in conducting individualized assessments of favorable and unfavorable mitigating factors that may affect duration of seizure-free intervals required before return to driving for individual patients. Individualized assessments should be conducted in a timely manner so that administrative delays do not extend the seizure-free intervals required to resume driving beyond medically appropriate periods. We further recommend that the board should

- 1. set the medical standards for driver licensing in collaboration with the DMV,
- 2. coordinate efforts to educate practitioners, patients, and the public about the medical aspects of driver licensing,
- 3. review complex cases that cannot be dealt with by the DMV according to the established protocol, and
- 4. continue to monitor the process and periodically review the guidelines.

Voluntary Surrender of Licenses

A mechanism should be in place to allow voluntary surrender of licenses by drivers, and replacement legal identification should be made available to individuals surrendering their licenses.

Hearing and Appeal Rights

Notice and opportunity for hearing or voluntary surrender of license should be available before a license is suspended. If imminent danger is apparent, the license may be suspended and a hearing held in a timely manner. In the event that a recommendation is filed to lift a suspension, the time to review the recommendation should be reasonably short because administrative time adds to the driving suspension, which may not be warranted in situations where a recommendation to lift the suspension has been filed.

Professional or Commercial Driving

Professional drivers include (but are not limited to) individuals licensed to drive commercial trucks, buses, ambulances, or taxis, as well as those contracting with ride-share networks. Because professional drivers are likely to spend more time driving and to drive larger vehicles and/or vehicles with multiple passengers, federal and state regulations on professional driving after seizure occurrence are stricter than those imposed on private drivers after seizures. The Epilepsy Foundation maintains a directory of state regulations on both private and commercial driving licensure requirements that clinicians and patients can access.³⁴

Functional Seizures (Also Known as Psychogenic Nonepileptic Seizures)

The evidence relating to risk of motor vehicle collisions caused by functional seizures is extremely limited, even when compared with the incomplete evidence relating to risk of collisions caused by epileptic seizures.³⁵ The limited evidence available suggests that individuals with functional seizures do have motor vehicle collisions because of these events and may have a higher rate of collisions (though a lower rate of severe injuries) compared with individuals with epileptic seizures.³⁶

Given these limited data, we recommend that individuals with functional seizures involving alterations in responsiveness and/or involuntary movements potentially affecting their ability to control a vehicle receive driving counseling and restriction similar to that given to individuals with epileptic seizures. In parallel to individuals with epileptic seizures, we also recommend that individuals with functional seizures (with a semiology likely to disrupt driving) be restricted from driving until free of functional seizures for a minimum of 3 months (or the relevant state's required seizure-free interval for epileptic seizures). Similar to epileptic seizures, we recommend that the required seizure-free interval be subject to modification based on individualized review by the treating clinician and/or medical advisory board, with more stringent restrictions for individuals seeking licensure as professional drivers.

Accommodations

Nations, states, and municipalities should provide alternative methods of transportation and accommodations for individuals whose driving privileges are restricted due to medical conditions. Alternatives might include remote work accommodations, public transportation, and subsidized transportation. Governments and medical advisory boards should consult patient advocacy organizations to ensure that services provided meet the needs of individuals with epilepsy.

Glossary

- Adherence: the degree to which a person's behavior corresponds to the agreed recommendations from a health care practitioner. In the context of medications, adherence refers to the degree to which a person takes an agreed-upon medication as prescribed.
- Antiseizure medication: A medication used to prevent or reduce the frequency and severity of epileptic seizures.
- Generalized seizure: An epileptic seizure beginning in both hemispheres (sides) of the brain simultaneously, or beginning in deep structures of the brain and spreading to both hemispheres simultaneously.
- Epilepsy: The predisposition to have recurrent epileptic seizures even in the absence of provoking factors.
- Epileptic seizure: A transient occurrence of signs or symptoms due to abnormal excessive or synchronous neuronal activity in the brain.
- Focal seizure: An epileptic seizure originating in 1 hemisphere (side) of the brain.
- Functional seizure: A transient episode of altered consciousness or involuntary movements resembling an epileptic seizure but which is not caused by epileptiform discharges in the brain and is believed to be driven by episodic dissociation or other psychological mechanisms.
- Health care practitioner: For the purposes of this position statement, the term "health care practitioner" refers to physicians and advanced practice providers.
- Impaired awareness: An epileptic seizure that causes confusion or decreased awareness of oneself or one's environment is described as a seizure "with impaired awareness." By contrast, a seizure that causes no confusion and during which the person is fully aware of themselves and their environment is described as a seizure "without impaired awareness."
- Nocturnal seizures: Seizures occurring only during sleep.
- Provoked seizure: An epileptic seizure triggered by a structural or metabolic abnormality that irritates the brain. Structural provoking factors might include a stroke or brain tumor. Metabolic provoking factors might include infection, electrolyte disturbances (such as hypoglycemia, hyponatremia, or hyponatremia), withdrawal of sedating drugs (such as alcohol or benzodiazepines), or intoxication with excitatory drugs (such as cocaine or amphetamines).

Neurology | Volume 104, Number 7 | April 8, 2025

e213459(6)

Acknowledgments

The following individuals were contributors to the development of this position statement as members of the Ethics, Law, and Humanities Committee, a joint committee of the American Academy of Neurology, American Neurological Association, and Child Neurology Society: Matthew Kirschen, MD, PhD, Vice Chair (Children's Hospital of Philadelphia); Katharina M. Busl, MD, MS (University of Florida); Winston Chiong, MD (University of California, San Francisco); Charles Flippen II, MD, FAAN (University of California, Los Angeles); Robin Conwit, MD, FAAN (NINDS/NIH); Julie Kurek, MD (Augusta University Medical Center); Daniel G. Larriviere, MD, JD, FAAN (Inova Neuroscience); Barney J. Stern, MD, FAAN (Johns Hopkins); Amy Tsou, MD (ECRI Institute); Ericka P. Greene (Simpson), MD, FAAN (Methodist Hospital); and Ariane Lewis, MD (New York University).

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Study Funding

The authors report no targeted funding.

Disclosure

The authors report no relevant disclosures. Go to Neurology.org/N for full disclosures.

Publication History

Received by *Neurology* November 1, 2024. Accepted in final form January 16, 2025. Submitted and externally peer reviewed. The handling editor was Editor-in-Chief José Merino, MD, MPhil, FAAN.

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