

# Epilepsy and driving

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Epilepsy is a neurological disorder characterized by recurrent seizures, which result in an altered level of consciousness.<sup>1</sup> Although appropriate management with antiepileptic drugs can result in seizure remission, 30-40% of epileptic patients are incompletely controlled.<sup>1</sup> A number of studies have shown that epileptic patients are more likely than age-matched controls to experience motor vehicle accidents (MVAs).<sup>2</sup> As a result, most developed countries impose driving regulations on epileptic patients.<sup>3,4</sup> However, the exact risk of epilepsy and MVAs is difficult to assess because of methodological flaws in most studies.<sup>5,6</sup> A recent review of the literature found that there was limited class one studies evaluating the risk of crashes in epileptic patients.<sup>5,6</sup> Therefore, there is a need to identify those epileptic patients with a high likelihood of seizure recurrence. The seizure-free interval is a simple measure that is attractive to regulatory agencies. A number of studies were conducted to look at various seizure-free intervals on the risk of recurrence.<sup>5-7</sup> The first report of an MVA attributable to a seizure was by Thalwitzer in 1906,<sup>8</sup> resulting in a general prohibition against driving by persons with epilepsy. Hierons (UK) in 1956<sup>9</sup> proposed that patients with epilepsy could drive safely if they had been seizure free for more than 5 years. This established the criterion of a seizure-free interval, which has been used ever since.<sup>5-7</sup> Patients with frequent seizures (short seizure-free intervals) should not drive. Patients with no or rare seizures (long seizure-free intervals) should be allowed to drive. It is difficult to guarantee seizure freedom for any particular patient, one can only express probabilities.<sup>6,7</sup>

## *International epilepsy and driving regulations.*

A questionnaire was sent to 231 neurologists (chosen from American neurological and epilepsy societies) from 84 countries, and to 230 official (embassies and consulates) representatives of 134 countries asking for the local rules and regulations, and their comments

on driving and epilepsy. One hundred and sixty-six responses were received from 96 of 134 (72%) countries. One hundred and six neurologists (of 231 queried [46%]) responded. In 16 countries, epileptic patients are not permitted to drive. In the remaining countries, these patients must have a seizure-free period of 6-36 months.<sup>10</sup> This period varies according to the type of seizure. In 5 countries, physicians must report the names of these patients to their local authorities. In many countries, the rules and regulations are being reevaluated and changed.<sup>10</sup> Unfortunately, laws that govern driving for epileptic patients are variable from country to country, and from one state to the other in the United States, requiring individual practitioners to be familiar with the local regulations.<sup>11</sup> In 16 countries, patients are not allowed to drive after having a seizure. These countries include Bulgaria, Mexico, Central African Republic, China, Portugal, Estonia, Rwanda, Ghana, Singapore, India, Taiwan, Japan, Turkey, Korea, and Uzbekistan.<sup>11</sup> In Japan, the driving regulations were amended in 2002, lifting the absolute ban on driving by epileptic patients, and granting licenses to them after a 2-year seizure-free period.<sup>12</sup> In other countries, patients with epilepsy are permitted to drive a motor vehicle after they have been free of seizures for a variable period of time.<sup>11</sup> Countries requiring a 24-month seizure-free interval include Andorra, Australia, Italy, Belgium, Luxembourg, Denmark, Malaysia, Norway, France, Slovenia, Germany, South Africa, Greece, Spain, Iceland, Sweden, and Ireland.<sup>10,11</sup> Countries requiring a 12-month seizure-free interval include Australia, New Zealand, Bermuda, Brazil, Romania, Canada, Cyprus, Germany, Switzerland, United Kingdom, Malta, Uruguay, and the Netherlands.<sup>11</sup> In the USA, the seizure-free period varies from 3-12 months between different states.<sup>13</sup> It is worth noting that regulations in 39 of the 51 American states require seizure-free periods

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of 6 months or less, or have flexible restrictions in the case of epilepsy.<sup>13</sup> The seizure-free interval required by some states such as Arizona has been reduced with no significant morbidity.<sup>14</sup> A few states require physicians to report patients with epilepsy.<sup>11,13</sup> The international regulations for driving with epilepsy also vary according to epilepsy and seizure type, whether the seizures are exclusively nocturnal; namely, during sleep only, first seizure, provoked seizures, antiepileptic drug withdrawal, and by the type of the motor vehicle as most countries apply very strict regulations for driving or even ban driving for commercial vehicles such as taxis, buses, or lorries.<sup>15</sup>

Despite the international variability in the driving with epilepsy regulations, all agree that countries should regulate the driver's license eligibility of persons with certain medical conditions such as epilepsy to ensure patient and public safety. The most common requirement for epileptic patients is that they should be seizure free for a specific period of time, and submit a physician's evaluation of their ability to drive safely. Another common requirement is the periodic submission of medical reports, in some countries for a specified period of time and in others for as long as the person remains licensed.<sup>10,12,15</sup> Considering driving is an integral part of modern living, and a necessity for work and daily living, the decision to prohibit epileptic patients with active epilepsy from driving will complicate their life as driving is essential to access services and employment especially in rural and urban areas where public transportation is poor. This will create further discrimination of epileptic patients in their societies in general, and at work in particular.<sup>16</sup> This is a major patient concern.<sup>16</sup> Another ethical concern is reporting epileptic patients to traffic departments. In certain countries, the reporting of epileptic patients is mandated within the applicable statutes, although this is far from universal, and despite assuming that physicians reporting their patients are an act performed in good faith to ensure patient and public safety, this raises the concern of injuring patients privacy and intruding into the doctor-patient relationship. It is the basis of this relationship that leads many doctors to argue most strongly against the mandatory reporting of people with epilepsy to the authorities.<sup>17</sup> It is argued that such impost results in patients concealing their true seizure frequency, and may lead to "doctor shopping" in the hope of finding a sympathetic physician that will refuse to comply with the law.<sup>17</sup> This has led to many physicians world wide believing that reporting epileptic patients is inappropriate.<sup>17</sup> This, together with the reluctance to report patients, despite a clear reason to do so, may cause the attending physician to be personally liable to litigation by victims of crashes

caused by the epileptic patients, should it be shown that the physicians acted without due diligence to the accepted duty of care to the community.<sup>17</sup> This confirms the necessity of obligatory reporting epilepsy to traffic departments by the patients themselves and application of stringent penalties on epileptic patients that do not report to the traffic department.<sup>18</sup> As the indication for strict bylaws on epilepsy and driving is to ensure patient and public safety, and not to obstruct the human needs of the patients, the governmental body should provide immediate satisfactory alternative solutions for epileptic patients suspended from driving with special allowances and effective public transportation to ensure their living satisfaction. International surveys showed that physicians are often ignorant of the guidelines regarding epilepsy, and driving.<sup>17,18</sup> This lack of awareness may result in physicians failing to honor their legal obligation.<sup>17,18</sup> Therefore, when framing the law for epilepsy and driving it is important to consider the concerns of patients, physicians, and regulatory agencies to achieve the balance between needs and demands, and ensure maximum benefit and best patient compliance. The law should be simple and not too stringent to improve compliance. The application of epilepsy and driving laws should be supervised, monitored, and periodically revised by a well structured advisory board composed of experienced personnel such as neurologists and other physicians dealing with epilepsy, psychologists, psychiatrists, social workers, lawyers, and traffic officers. The role of the advisory board is not only to evaluate and monitor the driving regulations, but also to conduct the individual appeal procedures. Alternative solutions for patients include easy and affordable public transportation when available or immediate social compensation with driving allowances, governmental facilitation for recruitment of personal drivers for patients forbidden to drive to improve their compliance and improve their quality of life.

Finally, education is a most important factor in appropriate applications in life. Physician and patient education are mandatory when applying laws for driving with epilepsy, to understand the nature of the disorder with the risk of seizure recurrence and to appreciate the risks of MVAs with epilepsy and related consequences. Both physicians and patients should well understand the details of the driving regulations in the country they live in with all related compensations and penalties for appropriate application. The role of the governmental and public media such as newspapers, television, radio, and public media campaigns on epilepsy and driving should be emphasized and activated to facilitate appropriate application.<sup>17,18</sup>

The topic of “epilepsy and driving” is of equal importance to neurologists and the regulators of driver licensing as driving is one of the top concerns of people with epilepsy, as is noticeable in the daily practice of any neurologist. However, driving with active epilepsy clearly poses an increased risk for MVAs in comparison with drivers with epilepsy who are in compliance with driving restrictions and on antiepileptic drugs.<sup>13</sup> Therefore, it is mandatory in all communities to establish clear bylaws for epilepsy and driving. The driving bylaws should cover the perspectives of the patients, physicians, and regulatory bodies to ensure the best application.

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## ETHICAL CONSENT

All manuscripts reporting the results of experimental investigations involving human subjects should include a statement confirming that informed consent was obtained from each subject or subject's guardian, after receiving approval of the experimental protocol by a local human ethics committee, or institutional review board. When reporting experiments on animals, authors should indicate whether the institutional and national guide for the care and use of laboratory animals was followed. Research papers not involving human or animal studies should also include a statement that approval/no objection for the study protocol was obtained from the institutional review board, or research ethics committee.