Section 5

Diseases of the nervous system

5.1 The nervous system in driving

To operate a motor vehicle safely, especially in heavy traffic or under extreme weather conditions, every driver must be able continuously to carry out a series of complex motions without hesitation and with great precision. Driving requires a reasonable level of intelligence, complete control over all muscle movements and freedom from the distracting influence of severe pain. In addition, a safe driver must always be alert, fully conscious and capable of quickly appreciating and responding to changing traffic patterns and road conditions.

The most common neurologic conditions that can adversely affect driving ability are listed and discussed below.

5.2 Febrile or toxic convulsions

Where convulsions are directly related to a toxic illness, either in childhood or in adult life, and the patient has fully recovered from the illness, these convulsions are of no concern in evaluating his or her medical fitness to drive.

5.3 Syncope

A history of syncope must always be treated seriously because a person who loses consciousness while driving may crash the vehicle. A single occurrence of syncope that is fully explained and unlikely to recur may require no more than careful observation. However, patients who have a history of a number of fainting spells or repeated unexplained falls should not drive until the cause has been determined and successful corrective measures taken. The condition of patients subject to loss of consciousness due to Stokes-Adams attacks or other cardiac arrhythmias (see Section 8 for explanation) should be reviewed 1 year after correction of the cardiac condition.

5.4 Seizures

The recommendations for seizures are presented in both tabular (see the following table) and textual format.

5.4.1 Single, unprovoked seizure before a diagnosis

Private drivers: These patients should not drive for *at least 3 months* and until a

Seizures	Private drivers	Professional drivers
Single, unprovoked seizure before a diagnosis	• not drive for at least 3 months and • get neurological assessment, including EEG and CT Scan	• not drive for at least 3 months • get neurological assessment, including EEG and CT Scan • if no epilepsy diagnosis, resume professional driving if seizure-free 12 months
After epilepsy diagnosis:	drive if: • 12 months seizure-free on medication* and • physician has insight into patient compliance • physician caution against fatigue, alcohol	• resume driving if 5 years seizure free off medication • resume driving if 10 years seizure free on medication
After surgery to prevent epileptic seizure	• resume driving if 12 months seizure free after surgery*	• resume driving if 10 years seizure free on medication • resume driving if 5 years seizure free off medication†
Seizures in sleep or immediately upon awakening	• drive if seizures only occur in sleep or upon awakening for at least 5 years (can reduce period if neurologist agrees)	• not drive
Medication withdrawal or change:		
(A) Initial withdrawal or change	• not drive for a period of 3 months from the time medication has been discontinued or changed.	
(B) If seizures recur after withdrawal or change	• resume driving if take medication according to the physician's instructions and • seizure free for 6 months (can reduce period if neurologist agrees)	• resume driving 5 years seizure free off medication • resume driving 10 years seizure free on medication
(C) Long-term withdrawal and discontinuation of medication	• drive any vehicle if seizure free off medication for 5 years	
Auras (Simple Partial Seizures)	drive if: • no impairment in level of consciousness or cognition • seizures are unchanged for more than 12 months • neurologist approves	drive if: • no impairment in level of consciousness • seizure pattern remained benign for at least 3 years • not generalized seizures • neurologist approves
Alcohol-withdrawal induced seizures	drive if: • remain alcohol-free and seizure free for 12 months • completed a recognized rehabilitation program for substance dependence	drive if: • remain alcohol-free and seizure-free for 12 months • completed a recognized rehabilitation program for substance dependence

Note: Private driving privileges for professional drivers are the same as those listed in the table for private drivers.
*Most private drivers with epilepsy resume driving after being seizure-free 12 months (irrespective of the treatment modality. This 12 month period may be reduced to 6 months on the recommendation of a neurologist).
†In certain types of epilepsy, the seizure free period of 10 years if on medication, may be reduced to 5 years, and the seizure free period of 5 years if off medication, may be reduced to 2 years, on the recommendation of a neurologist.

complete neurologic examination including electroencelphalography (EEG) and computed tomography (CT) has been carried out to determine the cause.

Professional drivers: Professional drivers should be told to stop driving passenger-carrying or commercial vehicles (classes 1–4) at once. For these drivers, there is a need for even greater certainty that another seizure will not recur while they are driving. At a minimum, professional drivers should follow the private driver guideline and not drive for at least 3 months after a single, unprovoked seizure. If a complete examination by a neurologist, including EEG and CT, does not suggest a diagnosis of epilepsy or some other condition that precludes driving, it is safe to recommend a return to professional driving after the patient has been *seizure free for 12 months.*

5.4.2 After a diagnosis of epilepsy

Private drivers: Patients with epilepsy and taking anti-epileptic medication should not be recommended for class 5 or 6 licensing until the following conditions are met:

Seizure-free period: The patient has been seizure free on medication for *not less than 12 months*. With certain types of epilepsy, this period may be reduced to 6 months on the recommendation of a neurologist. The seizure-free period is necessary to establish a drug level that prevents further seizures without side effects that could affect the patient's ability to drive safely. The anti-epileptic medication should have no effect on alertness and muscular coordination.

Patient compliance with medication and instructions: The attending physician should feel confident that the patient is conscientious and reliable and will continue to take the prescribed anti-seizure medication as directed, carefully follow the physician's instructions and promptly report any further seizures.

Physicians should advise epileptic patients that they should not drive for long hours without rest or when fatigued. Patients should also be told that their risk of seizures increases with the use of alcohol. Patients who require anti-epileptic medication and are known to drink alcohol to excess should not drive until they have been alcohol- and seizure-free for at least *12 months*. These patients often neglect to take their medication while drinking. As well, alcohol abuse is known to precipitate seizures.

A patient who stops taking anti-seizure medication against medical advice should never be recommended for driving. This prohibition on driving may change if the physician feels confident that the formerly noncompliant patient is again taking anti-epileptic medication as prescribed and will conscientiously do so in the future.

Professional drivers: It is unsafe for professional drivers who must take anti-epileptic medication to prevent seizures to operate passenger-carrying or commercial transport vehicles (classes 1–4). For these drivers, there is a need for even greater certainty that another seizure will not recur while they are driving. Professional drivers are often unable to avoid driving for long periods of time, frequently under extremely adverse conditions or highly stressful and fatiguing situations that could precipitate another

seizure. Unfortunately, seizures do sometimes recur even after many years of successful treatment.

Patients may drive any class of vehicle if they have been seizure free for 10 years on medication or 5 years off medication.

5.4.3 After surgery to prevent epileptic seizures

Private drivers: These patients should be seizure free for 12 months after the surgery before being recommended for driving any type of motor vehicle. This period may be reduced to 6 months on the recommendation of a neurologist.

Professional drivers: Professional drivers should be seizure free for 10 years if on medication or for 5 years if off medication. However, in certain types of epilepsy, these periods may be reduced to 5 years and 2 years, respectively, on the recommendation of a neurologist.

5.4.4 Seizures only while asleep or on wakening

Private drivers: Patients with epilepsy whose seizures have only occurred while they were asleep or immediately after awakening *for at least 5 years* can be recommended for a private licence (class 5 and 6). On the recommendation of a neurologist, this period may be reduced for patients who remain under the close observation of a neurologist.

Professional drivers: Professional drivers in this category should not drive passenger-carrying vehicles or commercial trucks (classes 1–4) because some patients with nocturnal epilepsy do, with the passage of time, begin to have daytime seizures.

5.4.5 Withdrawal of seizure medication or medication change

Initial withdrawal or change: Some patients with fully controlled seizures whose anti-epileptic medication is withdrawn or changed have a recurrence of their seizures. Because the relapse rate is 30–40%, patients must not drive for *3 months* from the time their medication is discontinued or changed. Such patients should always be cautioned that they could have further seizures.

After seizures recur: When seizures recur after a physician has ordered a discontinuation or a change in anti-epileptic medication, patients can resume driving provided they take the medication according to the physician's instructions and have been *seizure free for 6 months*. This period may be reduced on the recommendation of a neurologist.

Long-term withdrawal or discontinuation: Patients with epilepsy whose anti-seizure medication has been discontinued can safely drive any class of vehicle when they have been seizure free off medication for 5 years.

5.4.6 Auras (simple partial seizures)

Private drivers: Patients with auras with somatosensory, special sensory symptoms or nondisabling focal motor seizures in a single limb may be eligible for a

class 5 or 6 licence provided there is no impairment in their level of consciousness and cognition, the seizures are unchanged for more than 1 year and a neurologist approves.

Professional drivers: Patients with auras with somatosensory, special sensory symptoms or nondisabling focal motor seizures in a single limb may be eligible to drive passenger-carrying or commercial vehicles (classes 1–4) provided there is no impairment in their level of consciousness, the seizure pattern has remained benign for at least 3 years and have never been generalized and a neurologist approves.

5.4.7 Seizures induced by alcohol withdrawal

After a bout of heavy drinking, alcohol withdrawal can cause seizures in both epileptic and nonepileptic patients. Patients who have had alcohol withdrawal seizures should not drive any type of motor vehicle. Before they can recommence driving, these patients must complete a recognized rehabilitation program for substance dependence and remain alcohol free and seizure free for 12 months. A nonepileptic patient who has had a seizure induced by alcohol withdrawal does not require anti-epileptic medication. (See also section 3.3, *Recommended driving restrictions after the assessment*.)

5.5 Disorders affecting coordination and muscle strength and control

Loss of muscle strength or coordination occurs in a wide variety of disorders, each of which poses a special problem. This group includes such conditions as paralysis due to poliomyelitis, Parkinson's disease, multiple sclerosis, cerebral palsy, the muscular dystrophies, myasthenia gravis, tumour of the brain and spinal cord, spina bifida, organic brain damage following a head injury or stroke, Tourette's syndrome, Huntington's chorea and ataxias.

In the early stages of some of these conditions, no driving restrictions may be necessary. However, in serious cases, it will be immediately obvious that the applicant is unable to drive safely. Drivers with class 5 licences, who have mild loss of muscle strength or control, may have special controls added to their cars. The provincial and territorial motor vehicle licensing authorities know what types of controls are available and where they can be purchased. After the controls have been installed, the driver must satisfy an examiner that he or she can drive safely. (See also section 17, *Musculoskeletal disabilities*).

If the disorder is not progressive, one medical examination and road test will usually suffice. However, if the condition is progressive, the patient must be followed closely and driving discontinued when the disability reaches a point that makes driving unsafe. If the condition is also accompanied by cognitive impairment, impairment of memory, judgement or behaviour, or it is liable to lead to a loss of consciousness, then the patient should be told to stop driving.

5.6 Severe pain

Severe pain from such causes as a migraine headache, trigeminal neuralgia or lesions of the cervical or lumbar spine can decrease concentration or limit freedom of movement to a degree that can make driving extremely hazardous. This is a particular concern for professional drivers whose responsibilities may prevent them from stopping work even if the pain becomes disabling.

In addition, prescription and over-the-counter pain killers may interfere with a person's ability to drive safely. Patients who experience frequent, chronic and incapacitating pain should be advised to avoid driving while incapacitated.

5.7 Head injuries

Drivers who have had a recent head injury should always be examined with particular care to determine if there is any evidence of confusion or other symptoms that would make them temporarily unfit to drive. Although a minor head injury should not impair driving for more than a few hours, a more serious injury that results in even minimal residual brain damage or concussion should, without fail, be fully evaluated before driving is resumed. The major factors that may prohibit driving for an extended period are severe incapacitating headaches, loss of judgement, decreased intellectual capacity, post-traumatic seizures, visual deficiencies and loss of motor power. A person with persistent post-traumatic amnesia following a blow to the head should not drive any type of motor vehicle without undergoing a thorough medical examination. It may also be necessary to check the patient's cognitive function.

5.7.1 Post-traumatic seizure

A patient with head injury may resume driving after a post traumatic seizure.

Private drivers: A patient with a single seizure should not drive for at least 3 months and until a complete neurologic examination, including EEG, has been carried out.

Professional drivers: A patient with a single seizure should not drive for at least 12 months and until a complete neurologic examination, including EEG, has been carried out.

5.7.2 Post-traumatic epilepsy

The guidelines given for private and professional drivers in section 5.4.2, *After a diagnosis of epilepsy* should be applied to those with post-traumatic epilepsy.

5.8 Intracranial tumours

A patient who wishes to resume private or professional driving after removal of an intracranial tumour must be evaluated with great care.

5.8.1 Benign tumours

If a patient's judgement, coordination, visual fields, sense of balance, motor power and

reflexes are all found to be normal after the removal of a benign intracranial tumour, there is usually no reason to recommend any permanent driving restrictions.

If a seizure occurred either before or after the removal of a tumour, the patient should be *seizure free for at least 12 months with or without medication before resuming driving*.

5.8.2 Malignant tumours

No general recommendation can be made about driving after the removal of a *malignant or metastatic brain tumour*. The opinion of the consulting neurologist and the surgeon who removed the tumour should always be sought and each case evaluated individually. If there is a possibility that the tumour could recur, the physician should always ensure that the patient has a full understanding of the condition before sending a medical report to the motor vehicle licensing authority. If the motor vehicle licensing authority refuses to issue the class of driver's licence requested because of information provided on a medical report, the motor vehicle licensing authority must tell the affected person the reason for refusal. It would be unfortunate if the patient's first knowledge that a tumour could recur comes from someone other than the attending physician.