



**Ministry of Public Safety and Solicitor General
Office of the Superintendent of Motor Vehicles**

2010 BC Guide in Determining Fitness to Drive

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Foreword

We are pleased to present the 2010 BC Guide in Determining Fitness to Drive.

The Guide replaces the *1997 BC Guide for Physicians in Determining Fitness to Drive a Motor Vehicle*, 7th edition. **A companion piece to the 2010 BC Guide – The BC Driver Fitness Handbook for Physicians-a handbook for the use of doctors who may have to consider a patient's fitness to drive, will be published in the Spring of 2011.**

While the Guide represents a departure in how driver fitness policy is articulated in BC, it continues the 46 years of collaboration between the BC Medical Association (BCMA) and the Office of the Superintendent of Motor Vehicles (OSMV).

The policies and procedures in this Guide are the result of a lengthy and intensive process. In March 2006, The OSMV, in partnership with the BCMA, launched the Guide to Drive Project. Over the course of four years, the BCMA played an integral role in creating medical condition guidelines and a decision making framework for the OSMV.

The Guide represents the BCMA and OSMV's continuing commitment to anchor driver fitness determinations on the best-evidence available. In response to case law, the Guide presents an approach to driver fitness focused on functional ability to driver rather than diagnosis.

Implementation of the 2010 BC Guide in Determining Fitness to Drive reflects a continuing commitment to public safety while allowing the maximum driving privilege possible.

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PART 1:

BACKGROUND

Chapter 1: Introduction

1.1 How this Manual is organized

This Manual consists of 4 parts.

This first part, *Background*, provides the necessary context for the remainder of the manual. The 3 chapters within this part are:

- *Chapter 1: Introduction*, which explains the purpose of the Manual and the new developments that have influenced OSMV's approach to driver fitness
- *Chapter 2: The Driver Fitness Program*, which provides an overview of the authority for, and activities of, the Driver Fitness Program, as well as the roles and responsibilities of the various Driver Fitness Program partners, and
- *Chapter 3: Driver Fitness Program Principles*, which are the foundation for the policies and procedures presented in Parts 2 and 3 of the manual.

The second part, *Policies and Procedures*, outlines OSMV policies and procedures applicable to each of the four activities of the Driver Fitness Program. The five chapters within this part are entitled:

- *Chapter 4: Introduction to the Policies and Procedures*
- *Chapter 5: Screening Policies*. Because screening is largely conducted by OSMV's Driver Fitness Program partners, procedures are not included in this chapter.
- *Chapter 6: Assessment Policies and Procedures*
- *Chapter 7: Determination Policies and Procedures*, and
- *Chapter 8: Reconsideration Policies and Procedures*.

The third part of the Manual contains the medical condition chapters. The first chapter in this part, Chapter 9, is an introduction that outlines the purpose and the format of the medical condition chapters. *Chapter 10: Medical Conditions at-a-Glance*, is a table that may be used as a quick reference to determine how each of the identified medical conditions affects the functions necessary for driving. Chapters 11 through 31 are the actual medical condition chapters.

The fourth part of the Manual contains the Appendices. These include:

- *Appendix 1: Glossary of Terms* used throughout the Manual

- *Appendix 2: Excerpts from the MVA* that are relevant to the Driver Fitness Program
- *Appendix 3: Aging Drivers*, which describes the research in support of routine screening of drivers who are 80 years of age and older
- *Appendix 4: Licence Classes*, which describes the various classes of driver's licences
- *Appendix 5: Drafting and Approval Process*, which describes how the medical condition guidelines were drafted and approved
- *Appendix 6: The Relationship between BC Driver Fitness Policy and Policy in other Jurisdictions*, which is primarily of relevance to commercial drivers who wish to drive in the United States, and

1.2 Purpose of this Manual

This Manual documents the Driver Fitness Program policy and procedures of the Office of the Superintendent of Motor Vehicles. It is to be used by OSMV staff when making driver fitness determinations.

1.3 A changing approach to driver fitness

Prior to the publication of this Manual, the OSMV and health care practitioners in BC relied on the 1997 *Guide for Physicians in Determining Fitness to Drive a Motor Vehicle*, 7th edition (the Guide). The Guide was drafted in partnership between the OSMV and the British Columbia Medical Association (BCMA) and was published by the BCMA for use by both physicians and the OSMV.

The guidelines in the 1997 Guide were based on a diagnostic model for determining driver fitness. That is, guidelines were based primarily on the medical condition and the presumed group characteristics of people with that condition rather than on how the medical condition affected the functions necessary for driving on an individual basis. In terms of an evidentiary basis, the Guide reflected the consensus opinion of practicing physicians including members of specialty sections within the BCMA.

Since the 1997 edition, three developments have had a significant impact on driver fitness policy in BC:

1. A Supreme Court of Canada decision established the requirement to individually assess drivers. The ‘*Grismer*’¹ case held that each driver must be assessed according to the driver’s own personal abilities rather than presumed group characteristics.
2. The OSMV has adopted a functional approach to driver fitness. This means that the OSMV assesses the impact of a medical condition on the functions necessary for driving when making driver fitness determinations. The functions necessary for driving are described in 3.3. Where a medical condition results in a persistent impairment of the functions necessary for driving, the OSMV bases its driver fitness determination on the results of functional assessments that observe or measure the functions necessary for driving. If the impairment is episodic, the impact of the medical condition on the functions necessary for driving cannot be functionally assessed and the OSMV bases its driver fitness determination on the results of medical assessments. These concepts are explained fully in 6.5.
3. The OSMV has increased its emphasis on using research evidence, where it exists, as the basis of its driver fitness policies. Each medical condition in Part 3 of this Manual is included because the best available evidence shows that the medical condition causes impairment of one or more of the functions necessary for driving or has been associated with an elevated risk of crash or impaired driving performance. This information has been drawn from the integrative review performed by Dr. Bonnie Dobbs and documented in her report *Medical Conditions and Driving: A Review of the Scientific Literature 1960-2010*.

¹ British Columbia (Superintendent of Motor Vehicles) v. British Columbia (Council of Human Rights), [1999] 3 S.C.R. 868

Chapter 2: The Driver Fitness Program

2.1 The legal and policy authority for the Driver Fitness Program

The Motor Vehicle Act [RSBC 1996] Chapter 318

The *Motor Vehicle Act* (MVA) provides the statutory authority for the Driver Fitness Program.

Section 25 describes the statutory requirements regarding the application for and issuance of a driver's licence. It sets out the authority of the Superintendent to determine that applicants for various classes of driver's licences are able and fit to drive safely and to require an individual to be examined as to their fitness and ability to drive. It also authorizes the Superintendent to impose restrictions and conditions. Relevant portions of section 25 are reproduced in Appendix 2.

Section 29 extends the authority of the Superintendent to determine whether holders (post-licence) of various classes of driver's licences are able and fit to drive safely and authorizes the Superintendent to require a holder to be examined as to their fitness and ability to drive. The full text of section 29 is in Appendix 2.

Section 92 authorizes the Superintendent to direct the Insurance Corporation of British Columbia (ICBC) to cancel any class of driver's licence, cancel and issue a different class of driver's licence or prohibit a driver if the driver has a medical condition affecting fitness and ability to drive. It also authorizes the Superintendent to direct ICBC to cancel a driver's licence if the driver does not submit to an exam the Superintendent has required to assess fitness and ability to drive safely. The full text of section 92 is in Appendix 2.

The relationship between the MVA and the OSMV driver fitness policy

Policy plays an important role in the work of a regulatory body. To understand this role, OSMV decision-makers need to be familiar with the relationship between the MVA and OSMV policy.

Legislation

The primary statement of law is written in legislation. Legislation provides 'rules' that must be followed without exception or the exercise of discretion. Because legislation sets out 'rules,' it is broadly written. The

finer points of law are left to be defined and set out in regulation and policy. This allows for greater flexibility and, in the case of policy, the exercise of discretion.

Regulations

Regulations primarily fill in the details of legislation. Like legislation, regulations are law. However, they are subordinate legislation made under the authority of the statute. An advantage of regulations over legislation is that they are easier to change or repeal. By amending regulations, the government can adapt quickly to changing program needs and operational issues. There are no regulations under the MVA relating to driver fitness.

Policy

Driver Fitness Program policy is not passed by the government but is developed and approved within the OSMV. Policy is generally binding on program operations and will generally be upheld by a judicial or quasi-judicial body.

Policy is how the OSMV implements the Superintendent's authority under the MVA. The MVA authorizes the Superintendent to require a medical examination before granting a driver's licence. The policies articulated in this Manual provide the level of detail required by the OSMV to assess and determine driver fitness.

Policy can take many forms. In Chapters 5 through 8 of this Manual, Driver Fitness Program policy is presented as individually numbered policy statements. In the medical condition chapters, Driver Fitness Program policy is presented as:

- guidelines for the use of assessments
- medical condition guidelines, and
- reassessment interval guidelines.

When making driver fitness determinations, OSMV decision-makers will generally refer to both the general policy statements from Chapters 5 through 8 and the specific guidelines relevant to particular medical conditions from the medical condition chapters. Because each driver is unique and determinations are made on an individual basis, the medical condition chapters present "guidelines" rather than hard rules that must be followed without exception.

OSMV decision-makers need the policies and guidelines in this Manual to provide a framework for the exercise of their discretionary powers. If there are no criteria to guide decisions, the decisions may be arbitrary and, over time, inconsistent. The policies in this Manual provide a framework

for the exercise of discretion by OSMV staff responsible for driver fitness determinations.

2.2 Driver Fitness Program overview

The Driver Fitness Program assesses about 120,000 drivers annually. In an average year, 3,400 drivers have their driving privileges cancelled or denied for fitness reasons and 2,500 have their driving privileges restricted or reduced.

The flowcharts following this section of text highlight the four key activities of the Driver Fitness Program: Screening, Assessment, Determination and Reconsideration.

Screening identifies:

- individuals who have a known or possible medical condition that may impair their functional ability to drive
- commercial drivers, and
- aging drivers.

Screening policies are documented in Chapter 5 of this Manual.

Assessment is the process of collecting information required to make a driver fitness determination. The key assessment used for driver fitness determinations is a driver's medical examination completed by a physician – usually a driver's general practitioner or specialist. Information gathered during the medical examination is documented on the Driver Medical Examination Report (DMER). A variety of other assessments may also be required, such as specialist examinations or road tests. Assessment policies and procedures are documented in Chapter 6 of this Manual.

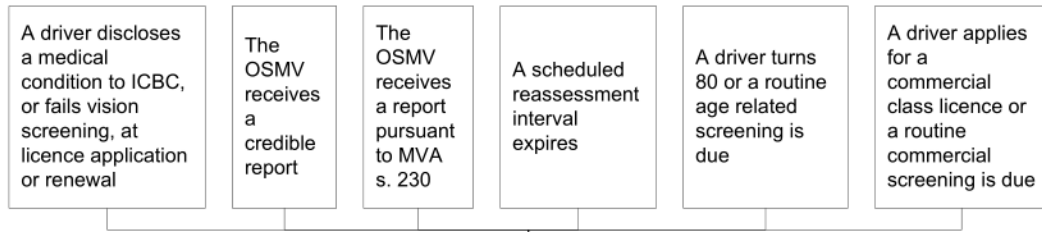
Determination involves reviewing:

- the information obtained from assessments
- any other relevant file information, such as driving history, and
- the medical condition guidelines outlined in Part 3 of this Manual

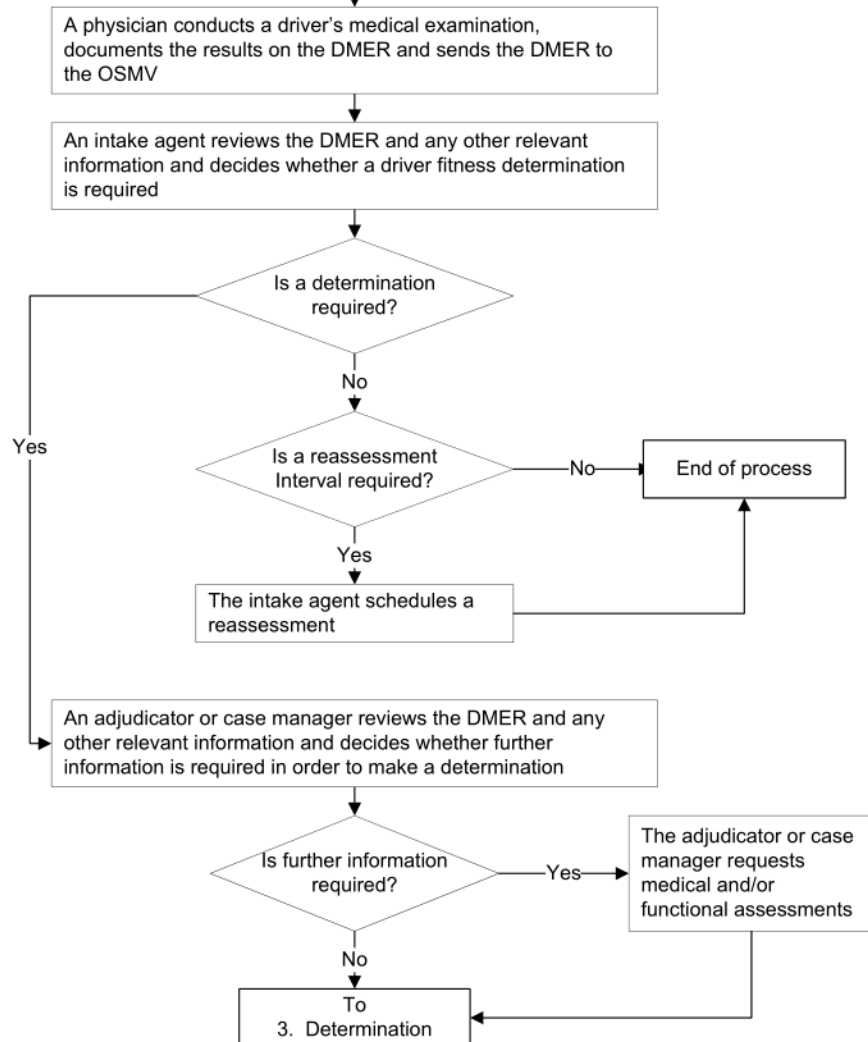
and determining whether an individual is fit to drive. Policies and procedures that govern the determination process are outlined in Chapter 7 of this Manual.

Reconsideration is the process of reviewing a driver fitness determination upon request of an individual who was found not fit to drive, or who had restrictions or conditions imposed. Policies and procedures that govern the reconsideration process are outlined in Chapter 8 of this Manual.

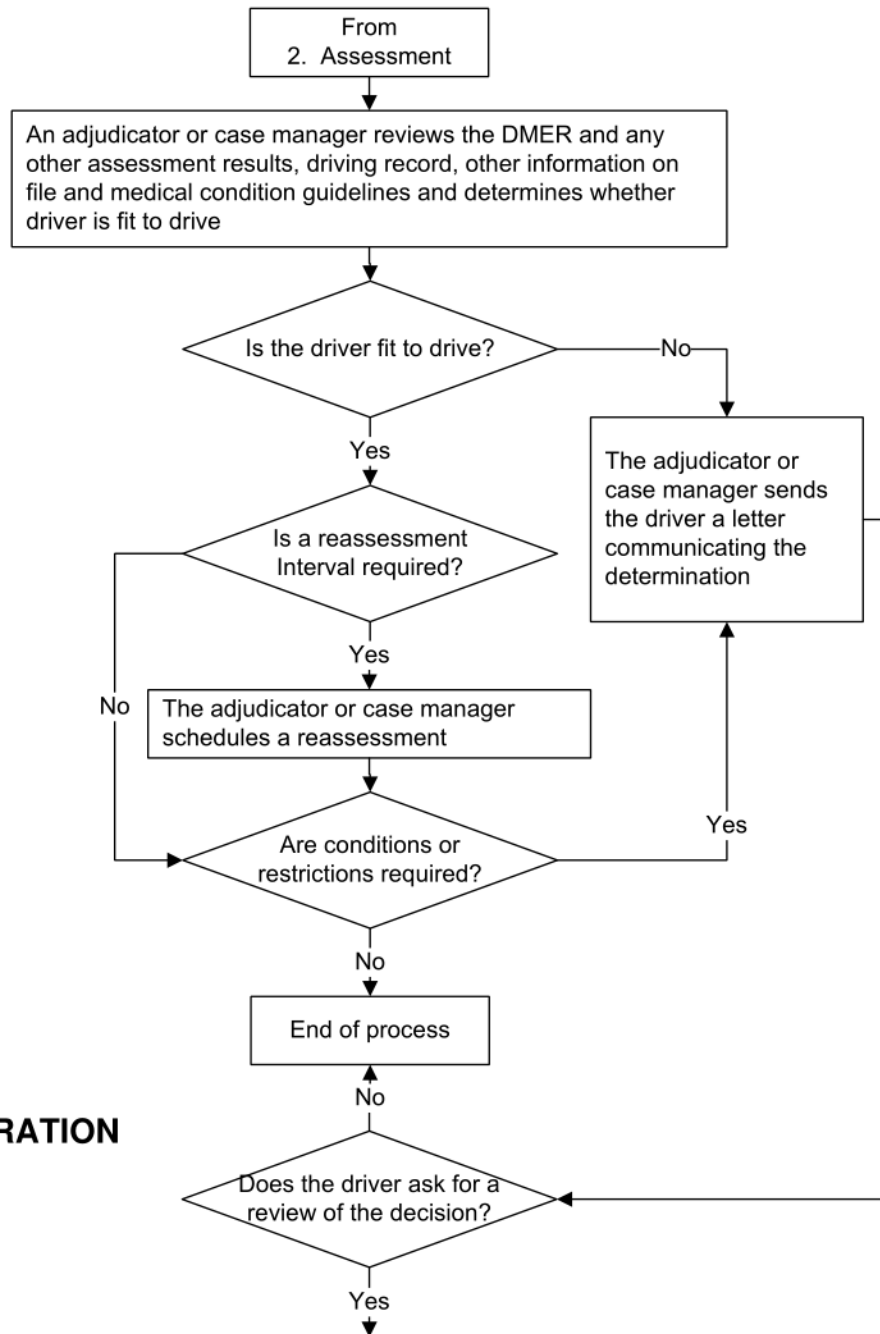
1. SCREENING



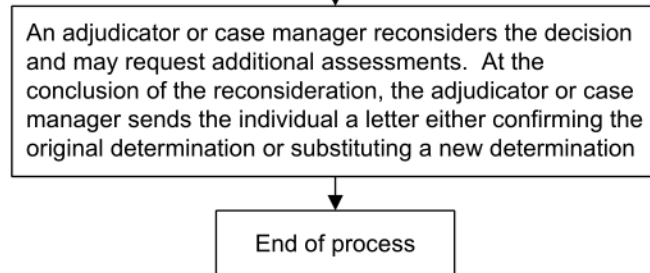
2. ASSESSMENT (subject to revision)



3. DETERMINATION



4. RECONSIDERATION



2.3 Roles and responsibilities

The OSMV works in partnership with ICBC and other agencies, such as the BCMA, to implement and administer the Driver Fitness Program. The following paragraphs highlight the roles and responsibilities of the key participants in the Driver Fitness Program.

Office of the Superintendent of Motor Vehicles

On a day-to-day basis, driver fitness determinations are made by OSMV case managers and adjudicators. Case managers and adjudicators also seek advice from the OSMV Medical Consultant and the Assistant Director of Hearings and Fair Practices, where necessary. The roles of various OSMV staff within the Driver Fitness Program are described in the paragraphs below.

Intake agents perform an initial review of DMERs and other assessment results that are sent to the OSMV. They identify those individuals who clearly meet the medical condition guidelines outlined in Part 3 of this Manual without the need for further assessment or a driver fitness determination. They identify and forward cases that require an exercise of discretion to adjudicators and case managers.

The procedures that guide the work of intake agents are documented in the:

- Intake Agent Triage Sort Procedures
- Intake Agent Guidelines for Assessing Fitness to Drive, and
- Intake Agent Procedures Manual.

Adjudicators are responsible for making decisions on medically uncomplicated cases; they may exercise discretion in decision-making.

Case managers are registered nurses responsible for making decisions on medically complicated cases; they may exercise discretion in decision making.

The *Medical Consultant* is a physician who provides medical advice and opinion on an individual's fitness to drive to both adjudicators and case managers.

The *Assistant Director of Hearings and Fair Practices* provides advice to adjudicators and case managers on complicated cases, in particular, cases where unique restrictions or conditions may be required and cases under reconsideration.

ICBC

In partnership with the OSMV and under delegation, ICBC performs some administrative functions for the Driver Fitness Program. In carrying out powers or responsibilities delegated to it under section 117(1) of the MVA, ICBC must act in accordance with any directives issued by the Superintendent.

ICBC also plays an important role in screening. Through direct questioning on a day-to-day basis, either at the time of initial licensing or licence renewal, ICBC Points of Service staff identify individuals who have a medical condition that may impair the functions necessary for driving. An individual applying for a driver's licence must also take a vision screening test at the ICBC Point of Service. If an individual discloses a medical condition or fails the vision screening test, ICBC staff may initiate a DMER or may decide not to issue a driver's licence until the OSMV indicates that the individual is fit to drive.

As the driver licensing authority for the province, ICBC has its own requirements that may impact individuals who have been the subject of an OSMV driver fitness determination. For example, ICBC will not issue a licence to an individual who hasn't held a licence for more than 3 years unless the individual takes an ICBC road test. This means that the OSMV may determine that an individual whose licence was cancelled for fitness reasons is now fit to drive because of an improvement in their medical condition, but ICBC may require successful completion of a road test before issuing a new licence.

Medical practitioners

Medical practitioners also play a role in screening. Under section 230 of the MVA, registered psychologists, optometrists and medical practitioners must report to the OSMV if:

- a patient has a medical condition that makes it dangerous to the patient, or to the public, for the patient to drive a motor vehicle, *and*
- continues to drive after the psychologist, optometrist or medical practitioner warns the patient of the danger.

The full text of section 230 is included in Appendix 2.

In addition to this reporting duty, medical practitioners conduct assessments and provide information to the OSMV on a patient's prognosis, treatment and extent of impairment. Sometimes medical practitioners are asked to comment directly on driving ability.

Allied health care practitioners

Allied health care practitioners such as occupational therapists, driver rehabilitation therapists and physiotherapists may be asked to conduct assessments of drivers.

Individual drivers

When applying for or renewing a British Columbia driver's licence of any class, individuals are asked if they have any medical conditions that affect driving. When an applicant reports a medical condition that could affect the functions necessary for driving, a DMER is generally issued. The individual is responsible for taking this to their doctor to be completed.

Based on information provided by the physician on the DMER, an individual may be required to submit to additional assessments for the OSMV to determine their fitness to drive.

Once a determination is made, individuals must comply with any conditions or restrictions imposed by the OSMV or, if their licence is cancelled, surrender the licence to ICBC. Individuals are informed of conditions, restrictions and licence cancellations in a letter from the OSMV.

Commercial drivers who wish to drive outside of BC

Commercial drivers who wish to drive outside of BC must familiarize themselves with any medical condition-related restrictions or prohibitions applicable in other jurisdictions. Appendix 6 provides an overview of the relationship between BC Driver Fitness Program policy and policies applicable to commercial drivers who wish to drive in the United States.

Chapter 3: Driver Fitness Program Principles

3.1 Overview

The OSMV has articulated the following four principles that guide the Driver Fitness Program. By following these principles, the OSMV ensures that drivers are given the maximum licensing privilege possible taking into account their medical condition, its impact on the functions necessary for driving and the driver's ability to compensate for the condition.

Risk management

1. Public safety is the primary consideration when making driver fitness determinations, but a degree of risk to public safety may be tolerated in order to allow a broad range of people to drive.

Functional approach

2. Driver fitness determinations will be based primarily on functional ability to drive, not diagnosis

Individual assessment

3. Driver fitness determinations will be based on individual characteristics and abilities rather than presumed group characteristics and abilities.

Best information

4. Driver fitness determinations will be based on the best information that is available.

Each of these principles is explained in detail in the following sections.

3.2 Risk management

Public safety is the primary consideration when making driver fitness determinations, but a degree of risk to public safety may be tolerated in order to allow a broad range of people to drive.

While public safety is the primary consideration in driver fitness determinations, it is not the only consideration. In *Grismer*, the Supreme Court of Canada indicated that people with some level of functional impairment may have a licence because society can tolerate a degree of risk in order to permit a wide range of people to drive. In its decision, the court states:

“Striking a balance between the need for people to be licensed to drive and the need for safety of the public on the roads, [the Superintendent] adopted a standard that tolerated a *moderate degree of risk*. The Superintendent did not aim for perfection, nor for absolute safety. The Superintendent rather accepted that a degree of disability and the associated increased risk to highway safety is a necessary trade-off for the policy objectives of permitting a wide range of people to drive and not discriminating against the disabled. *The goal was not absolute safety, but reasonable safety.*” [para. 27] [emphasis added]

To achieve this balance between road safety and an individual’s need to drive, the OSMV applies a risk management approach to driver fitness determinations. This means that, when making a driver fitness determination, the OSMV considers the degree of risk presented by an individual driver. If the OSMV’s analysis indicates a high degree of risk, the individual is not fit to drive.

How does the OSMV determine the degree of risk presented by an individual driver?

Risk is often defined as a formula; that is, risk is the likelihood of an uncertain event multiplied by the consequence if the event were to take place. This means that a highly likely event with serious consequences is a greater risk than an unlikely event with minor consequences.

Unfortunately, there are no reliable formulas to calculate risk as it relates to fitness to drive. The impact of a medical condition may be specific to an individual and the ability to compensate for the medical condition may also vary by individual. As well, because the driving environment is complex and continuously changing, it is difficult to determine exactly what level of impairment means a person is not fit to drive.

Because of these limitations, the OSMV cannot precisely calculate the risk presented by a driver with a particular medical condition. However, the OSMV can determine the general degree of risk presented by a driver with a particular medical condition by using a risk assessment analysis that takes into account:

- research associating the medical condition with adverse driving outcomes or evidence of functional impairment
- expert opinion regarding the degree of risk associated with the medical condition at various severity levels, and
- the individual characteristics and abilities of each driver, for example whether the driver:
 - is a commercial or private driver
 - can compensate for the functional impairment
 - is compliant with their treatment regime, and
 - has insight into the impact that their medical condition may have on driving.

The policies outlined in this manual guide OSMV decision-makers in determining the degree of risk presented by individual drivers. The medical condition guidelines included in the medical condition chapters of this manual are based on the best available evidence regarding degree of risk and identify where the use of conditions, restrictions and/or compensation strategies may be appropriate to reduce risk. If the risk associated with a medical condition at a certain severity level is high, and the risk cannot be reduced through the use of conditions, restrictions and/or compensation strategies, the guidelines indicate that an individual is not fit to drive. By applying the medical condition guidelines, OSMV decision-makers are practising risk management.

3.3 Functional approach

Driver fitness determinations will be based on a functional approach to driver fitness.

The OSMV takes a functional approach to determining driver fitness. This means that, when making driver fitness determinations, the OSMV assesses the effect(s) that a medical condition has on the functions necessary for driving.

Functions necessary for driving

The functions necessary for driving are cognitive, sensory (vision) and motor (including sensorimotor) ².

Each of these functions is described below. Although the functions necessary for driving are described individually, driving is a complex perceptual-motor skill which usually takes place in a complex environment and which requires the functions to operate together.

Cognitive functions

The cognitive functions that are the most relevant to the driving task are:

Attention (divided, selective, sustained)

Divided attention

- the ability to attend to two or more stimuli at the same time.

Example: attending to the roadway ahead while being able to identify stimuli in the periphery

Selective attention

- the ability to selectively attend to one or more important stimuli while ignoring competing distractions

Example: the ability to isolate the traffic light from among other environmental stimuli

Sustained attention

- also referred to as vigilance. It is defined as the capacity to maintain an attentional activity over a period of time

Example: the ability to attend to the roadway ahead over an extended period of time.

Short-term or passive memory

- refers to the temporary storage of information or the brief retention of information that is currently being processed in a person's mind

² The organizational framework for the functions necessary for driving used in this manual are taken from Dr. Bonnie Dobbs' chapter on Function and Driving from her research document *Medical Conditions and Driving: A Review of the Scientific Literature 1960-2010*.

Example: the temporary storage of information related to roadway sign information such as that related to freeway exits or construction areas; signs related to caution ahead, etc.

Working memory (the active component of short-term memory)

- refers to the ability to manipulate information with time constraints/taking in and updating information

Example: environmental information related to the driving task on a busy freeway.

Long term memory

- refers to memory for personal events (autobiographical memory) and general world knowledge (semantic memory). Long term memory differs from short term memory in a number of areas:
 - capacity – long term memory has an unlimited capacity compared to the limited capacity of short term memory:
 - duration – information stored in long term memory is relatively stable for an indefinite period of time. Information in short term memory, on the other hand, is very fleeting.

Example: knowing your way from home to the grocery store; the meaning of traffic signs; and knowing the rules of the road.

Choice/complex reaction time

- refers to the time taken to respond differentially to two or more stimuli or events. The time taken to respond and the appropriateness of the response are important within the driving context

Example: responding when a cat darts onto the edge of the road at the same time a pedestrian steps onto the roadway.

Tracking

- defined as the ability to visually follow a stimulus that is moving or sequentially appearing in different locations

Example: the ability to visually follow other cars on the road.

Visuospatial abilities

- is a general category that refers to processes dependent on vision such as the recognition of objects, the ability to mentally rotate objects, determinations of relationships between stimuli based on size or color.

Example: understanding where a tree and other objects are in relation to the car.

Executive functioning (see also central executive functioning below)

- refers to those capabilities that enable an individual to successfully engage in independent, purposeful, and self-serving behaviours. Disturbances in executive functioning are characterized by disturbed attention, increased distractibility, deficits in self-awareness, and preservative behaviour.

Central executive functioning (see also executive functioning above)

- refers to that part of working memory that is responsible for ‘supervising’ many cognitive processes including encoding (inputting information from the external world), storing information in memory, and retrieving information from memory.
- central executive (CE) functioning includes abilities such as planning and organization, reasoning and problem solving, conceptual thought, and decision making. CE functioning is critical for the successful completion of tasks that involve planning or decision making and that are complex in nature

Example: making a left turn at an uncontrolled intersection.

Visual information processing

- defined as the processing of *visual information* beyond the perceptual level (e.g., recognizing and identifying objects and decision making related to those objects).
- visual information processing involves higher order cognitive processing. However, because of the visual component, references to visual information processing often are included within the visual domain.

Research indicates that individuals with progressive or irreversible declines in cognitive function cannot compensate for their cognitive impairment.

Motor functions (including sensorimotor)

Motor functions include:

Coordination

- the ability to execute smooth, accurate, controlled movements

Example: executing a left hand turn; shifting gears, etc.

Dexterity

- readiness and grace in physical activity; especially skill and ease in using the hands

Example: inserting keys into the ignition; operating vehicle controls, etc.

Gross motor abilities

- gross range of motion and strength of the upper and lower extremities, grip strength, proprioception, and fine and gross motor coordination.

Range of motion

- defined as the degree of movement a joint has when it is extended, flexed, and rotated through all of its possible movements. Range of motion of the extremities (e.g., ankle extension and flexion are needed to reach the gas pedal and brake) and upper body range of motion (e.g., shoulder and elbow flexion are necessary for turning the steering wheel; elbow flexion is needed to turn the steering wheel; range of motion of the head and neck are necessary for looking at the side and rear for vehicles and for identifying obstacles at the side of the road or cars approaching from a side street).

Strength

- the amount of strength a muscle can produce

Example: lowering the brake pedal.

- for many functions, muscle strength and flexibility often go hand in hand

Example: getting in and out of the car; operating vehicle controls, fastening the seat belt, etc.

Flexibility

- the ability to move joints and muscles through their full range of motion (see examples above).

Reaction time

- the amount of time taken to respond to a stimulus

Example: depressing the brake pedal in response to a child running out on the roadway, swerving to avoid an animal on the road, etc.

Research on motor functions and driving indicates considerable variability in the association between the different motor functions and driving outcomes. Overall, the research suggests that a significant level of impairment in motor functions is needed before driving performance is affected to an unsafe level.

Sensorimotor

- for purposes of the Driver Fitness Program, sensorimotor functions are considered as a subset of motor functions.
- sensorimotor function is a combination of sensory and motor functioning for accomplishing a task.
- sensorimotor functions are, for the most part, reflexive or automatic e.g., the response to your hand being placed on a hot stove; ability to sit upright, etc.
- vestibular disorders and peripheral vascular diseases commonly result in sensorimotor impairments.

Sensory functions (Vision)

Visual functions important for driving include:

Acuity

- the spatial resolving ability of the visual system, e.g., the smallest size detail that a person can see.
- visual acuity typically is assessed by having the person read a letter chart such as the Snellen chart, where the first line consists of one very large letter, with subsequent rows having increasing numbers of letters that decrease in size.

Visual field

- refers to an individual's entire spatial area of vision when fixation is stable, e.g., the extent of the area that an individual can see with their eyes held in a fixated position.

Contrast sensitivity

- the amount of contrast an individual needs to identify or detect an object or pattern, e.g., the ability detect a gray object on a white background or to see a white object on a light gray background.

- an individual with poor contrast sensitivity may have difficulty seeing traffic lights or cars at night. Conditions such as cataracts and diabetic retinopathy affect contrast sensitivity.

Disability glare

- the degradation of visual performance caused by a reduction of contrast. It can occur directly, by reducing the contrast between an object and its background, i.e. directly affecting the visual task, or indirectly by affecting the eye.

Examples: the reflection of the sun from a car dashboard, and the view through a misted up windscreen.

Perception

- refers to the process of acquiring, interpreting, selecting, and organizing sensory information.

Results from studies investigating the relationship between visual abilities and driving performance are, for the most part, equivocal. It may be, as suggested for motor abilities, that a significant level of visual impairment is needed before driving performance is affected.

3.4 Individual assessment

Driver fitness determinations will be based on individual characteristics and abilities rather than presumed group characteristics and abilities.

In the *Grismer* case, the Supreme Court of Canada held that each driver must be assessed according to the driver's own personal abilities rather than presumed group characteristics. The case originated from a complaint to the BC Council of Human Rights regarding the OSMV's cancellation of a driver's licence. The OSMV had cancelled the licence because the driver's vision did not meet the minimum standard established in the Guide. The *Grismer* decision is applicable to driver fitness determinations for individuals with persistent impairments. The courts have not yet considered the issue of individual assessments for drivers with episodic impairments.

The discrimination found in the *Grismer* case was not because the OSMV cancelled a licence but because the driver did not have the opportunity to prove through an individual assessment that he could be licensed without unreasonably jeopardizing road safety. The court held that the OSMV made an error when it adopted an absolute standard which was not supported by evidence.

Delivering the judgement of the Court, McLachlin J. wrote that:

“Driving automobiles is a privilege most adult Canadians take for granted. It is important to their lives and work. While the privilege can be removed because of risk, it must not be removed on the basis of discriminatory assumptions founded on stereotypes of disability, rather than actual capacity to drive safely. ... This case is not about whether unsafe drivers must be allowed to drive. There is no suggestion that a visually impaired driver should be licensed unless she or he can compensate for the impairment and drive safely. Rather, this case is about whether, on the evidence ... [the driver] should have been given a chance to prove through an individual assessment that he could drive.”

The medical condition guidelines outlined in the medical condition chapters of this Manual are based on presumed group characteristics of individuals with each medical condition. However, consistent with the decision in *Grismer*, the OSMV makes driver fitness determinations on an individual basis. This is why the medical condition guidelines are called guidelines; they are a starting point for decision-making, but may not apply to every individual. Where appropriate, the OSMV utilizes individual assessments to determine whether an individual’s functional ability to drive is impaired and, if so, whether the individual can compensate for the impairment.

3.5 Best information

Driver fitness determinations will be based on the best information that is available.

For each individual, the OSMV gathers the best information that is available and required to determine fitness. Depending upon the nature of the functional impairment, the best information may include results of specialized functional assessments that clearly indicate whether or not an individual is fit to drive, such as a DriveABLE assessment that measures impairment of cognitive ability as it relates to driving. For other individuals and impairments there may be no scientifically validated assessment tools available that can accurately measure the impact of a medical condition on the functions necessary for driving. In the case of individuals with episodic impairments, the OSMV has to rely on the results of medical assessments as the best information available for determining fitness to drive.

PART 2:

POLICIES AND PROCEDURES

Chapter 4: Introduction to the Policies and Procedures

4.1 Overview

The flowcharts on the following two pages highlight the four key activities of the Driver Fitness Program: Screening, Assessment, Determination and Reconsideration.

Screening identifies individuals who have a known or possible medical condition that may impair their functional ability to drive, commercial drivers and aging drivers. Screening policies are documented in Chapter 5 of this Manual.

Assessment is the process of collecting information required to make a driver fitness determination. The key assessment used for driver fitness determinations is a driver's medical examination completed by an individual's general practitioner and documented on the Driver Medical Examination Report (DMER). A variety of other assessments may also be required, such as specialist examinations or road tests. Assessment policies and procedures are documented in Chapter 6 of this Manual.

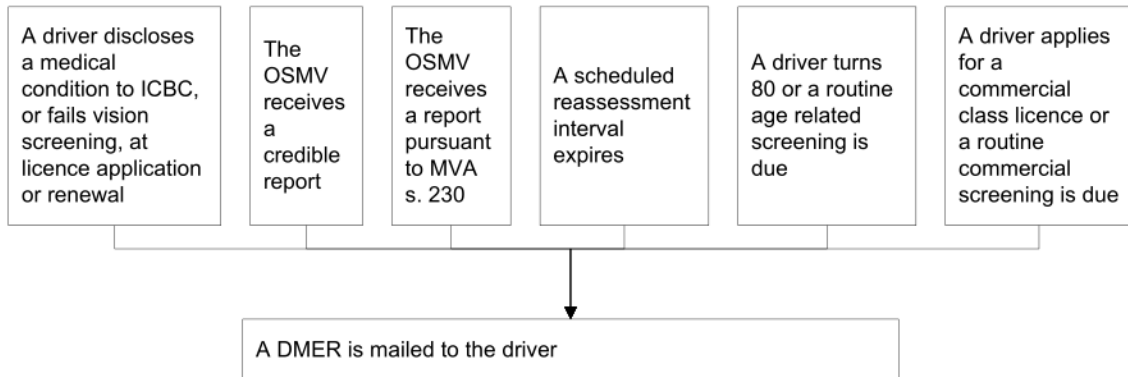
Determination involves reviewing:

- the information obtained from assessments
- any other relevant file information, such as driving history, and
- the medical condition guidelines outlined in Part 3 of this Manual

and determining whether an individual is fit to drive. Policies and procedures that govern the determination process are outlined in Chapter 7 of this Manual.

Reconsideration is the process of reviewing a driver fitness determination upon request of an individual who was found not fit to drive, or who had restrictions or conditions imposed. Policies and procedures that govern the reconsideration process are outlined in Chapter 8 of this Manual.

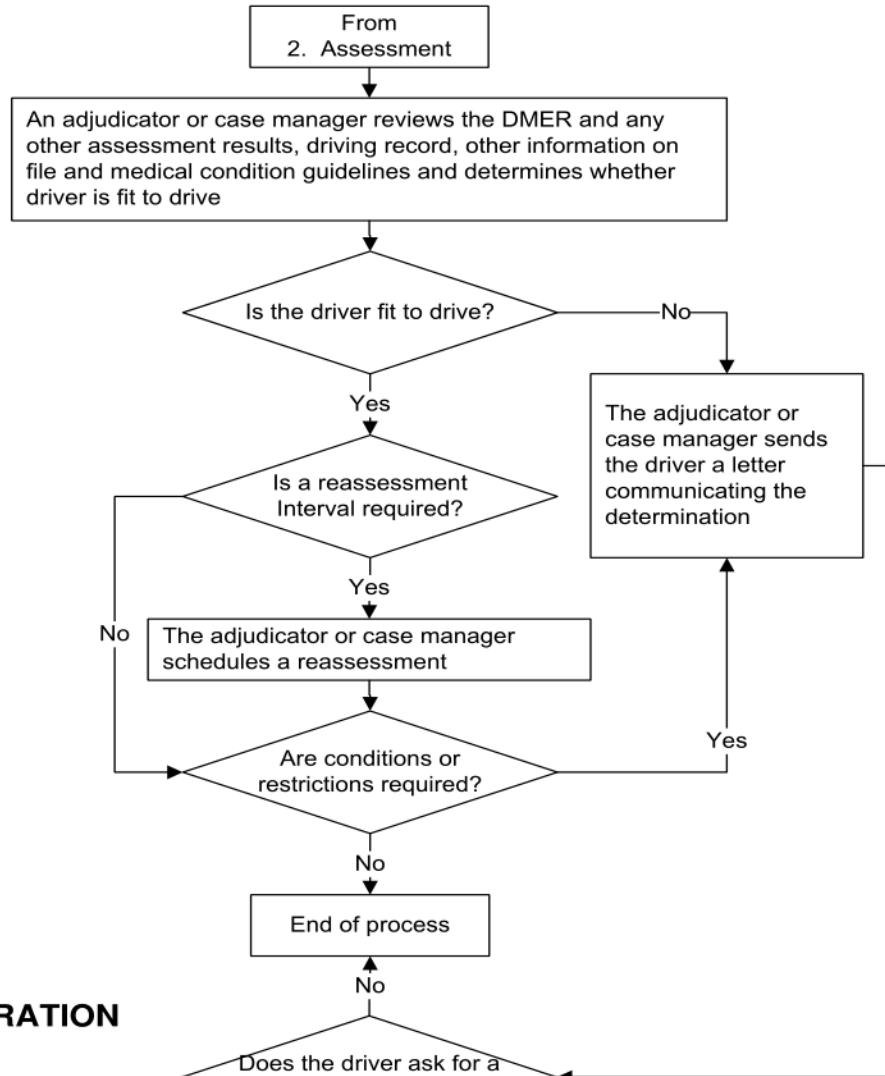
1. SCREENING



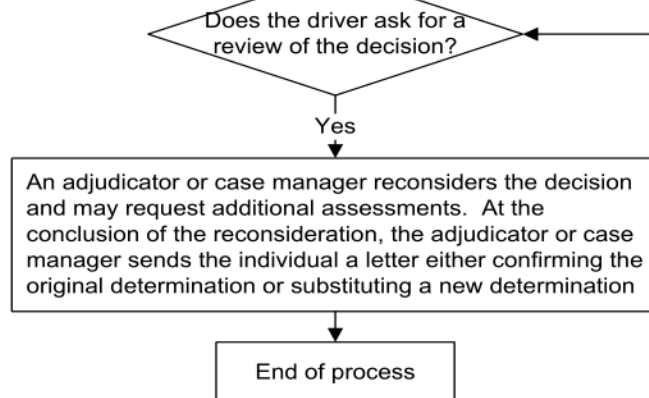
2. ASSESSMENT (subject to revision)



3. DETERMINATION



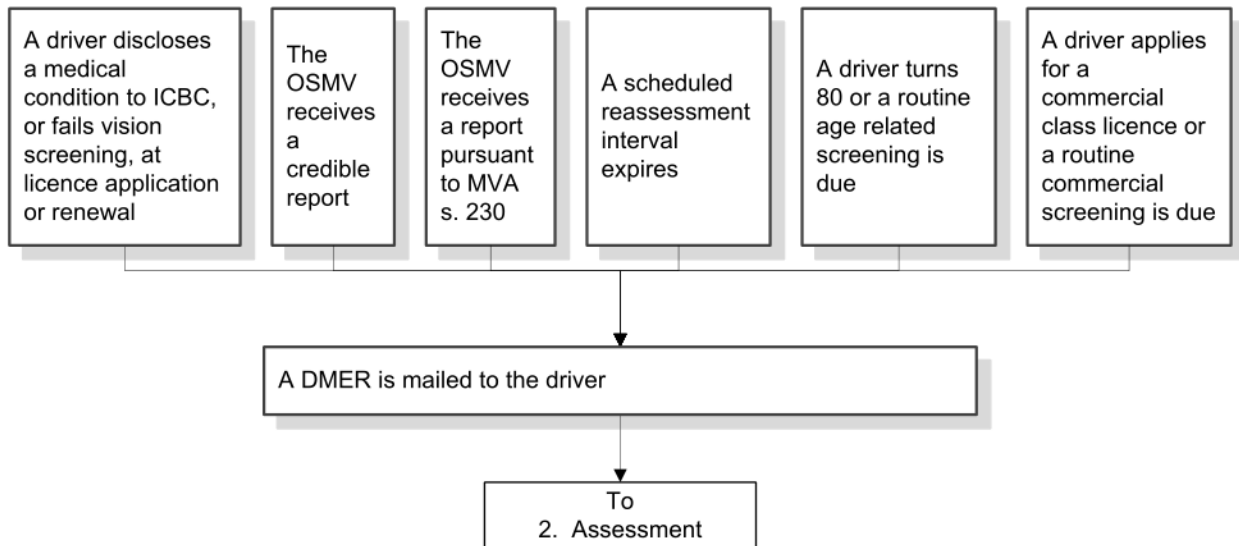
4. RECONSIDERATION



Chapter 5: Screening Policies

5.1 Overview

The following flowchart is an excerpt from the overview flowchart presented in 4.1 that highlights in red the steps involved in screening.



Screening identifies individuals with a known or possible medical condition that may impair the functions necessary for driving, commercial drivers and aging drivers. Screening occurs when:

- an individual applies for a British Columbia driver's licence, renewal of a licence, or a licence class upgrade and discloses a medical condition that may impair the functions necessary for driving
- a medical practitioner, optometrist or psychologist reports a driver to the OSMV pursuant to MVA s. 230
- police, health care practitioners or other individuals submit a credible report to the OSMV
- an individual attends for a follow-up medical assessment for a previously identified medical condition that may impair the functions necessary for driving
- an individual first applies for a commercial class driver's licence and at scheduled intervals pursuant to the CCMTA Medical Standards for Drivers if an individual holds a commercial class driver's licence, and
- a driver reaches the age of 80 and every two years thereafter.

Once identified, a DMER is mailed to the individual with instructions to take the DMER to their physician for a driver's medical examination. The DMER may be initiated:

- by staff at an ICBC Point of Service
- by OSMV staff upon receipt of a credible report or report pursuant to MVA s.230, or
- automatically by the OSMV system in the case of commercial drivers, aging drivers and other drivers who have scheduled reassessment intervals.

5.2 Screening individuals with known or possible medical conditions

Definitions

Credible report

means an unsolicited report from:

- a health care professional
- the police
- ICBC front-line staff
- a government agent
- a family member, or
- a concerned member of the public

that provides objective information about a driver's functional ability to drive.

Medical condition

is any injury, illness, disease or disorder that is identified in Part 3 of this Manual or that may impair the functions necessary for driving. For purposes of the Driver Fitness Program, impairment resulting from medications and/or treatment regimes that have been prescribed as treatment for a medical condition is also considered a medical condition. General debility and a lack of stamina are also considered as medical conditions that may impair the functions necessary for driving.

Policy

- 5.2.1 The Driver Fitness Program screens individuals whose functional ability to drive may be impaired by a known or possible medical condition.
- 5.2.2 An individual with a known medical condition that may impair the functions necessary for driving will be screened when:
- (a) a physician or other health care professional reports to the OSMV that the individual has a medical condition that may impair the functions necessary for driving
 - (b) the individual discloses a medical condition that may impair the functions necessary for driving when they apply for, or renew, their driver's licence, or
 - (c) an OSMV-scheduled reassessment interval for an individual with a previously reported medical condition expires.
- 5.2.3 An individual with a possible medical condition that may impair the functions necessary for driving will be screened when the OSMV receives a credible report that documents a concern regarding the individual's functional ability to drive.

Policy rationale

Sections 25 and 29 of the MVA authorize the Superintendent to examine an individual's fitness and ability to drive. While the OSMV operates other programs that are concerned with fitness and ability to drive, such as its Driver Improvement Program, the Driver Fitness Program is specifically concerned with individuals whose fitness and ability to drive may be impaired by medical conditions. This includes individuals who may be impaired by medications or treatment regimes prescribed as treatment for a medical condition, general debility or a lack of stamina. To ensure that individuals are not screened unnecessarily, the Driver Fitness Program only screens private drivers under the age of 80 where there is evidence that the individual has a medical condition that may impair the functions necessary for driving.

5.3 Screening aging drivers

Definitions

Private driver

means a driver with a class 5, 6, 7 or 8 licence.

Policy

5.3.1 The Driver Fitness Program routinely screens private drivers every two years starting at the age of 80.

Policy rationale

Because of the increased risk of medical conditions and adverse driving outcomes associated with aging drivers, drivers over the age of 80 are routinely screened every two years, even if there is no evidence of a known or possible medical condition. A detailed description of the research indicating an increased risk associated with aging drivers is included in Appendix 3.

5.4 Screening commercial drivers

Definitions

Commercial driver

means a driver with:

- a class 1, 2, 3 or 4 licence, or
- a class 5 licence with endorsement 18, 19 or 20.

Policy

5.4.1 The Driver Fitness Program routinely screens commercial drivers at the time of licence application and then at the following intervals:

- (a) up to age 45, every 5 years
- (b) from age 45 to age 65, every 3 years, and
- (c) from age 65, annually.

Policy rationale

Commercial drivers drive a variety of vehicles including large trucks and passenger carrying vehicles such as buses. A list of licence classes is included in Appendix 4. Professional drivers who operate passenger carrying vehicles, trucks and emergency vehicles spend many more hours at the wheel, often under far more adverse driving conditions, than do the drivers of private vehicles. They are usually unable to select their hours of work and cannot readily abandon their passengers or cargo should they become unwell when on duty. Persons operating emergency vehicles are frequently required to drive while under considerable stress by the nature of their work, and often in inclement weather where driving conditions are less than ideal. Should a crash occur, the consequences are much more likely to be serious, particularly where the driver is carrying passengers or dangerous cargo such as propane, chlorine gas, toxic chemicals or radioactive substances.

Because of this greater exposure, commercial drivers are routinely screened at regular intervals, even if there is no evidence that the driver has a known or possible medical condition. To ensure consistency with other provinces, BC has adopted the CCMTA Medical Standards for Drivers guidelines for screening commercial drivers.

5.5 Transient impairments

Definitions

Transient impairment

means a temporary impairment of the functional ability to drive where there is little or no likelihood of a recurring episodic, or ongoing persistent, impairment. Examples of transient impairments are:

- the after-effects of surgery, e.g. the time to recover from the anaesthetic and the surgery itself
- fractures and casts, post-orthopedic surgery
- concussion
- eye surgery, e.g. cataract surgery
- use of orthopaedic braces (including neck), and
- cardiac inflammation and infections.

Policy

5.5.1 The Driver Fitness Program does not screen individuals with transient impairments.

Policy rationale

The OSMV does not need to know when a driver has experienced a transient impairment. In these cases, a doctor may rely on best practices to tell a patient, for example, “don’t drive for 6 weeks after your abdominal surgery.” The Canadian Medical Association (CMA) Guide for Physicians when Determining Fitness to Drive (2007) contains guidelines for physicians for many transient impairments associated with a range of medical conditions.

5.6 Cancelling or restricting a licence because of an immediate public safety risk

Policy

5.6.1 If the information obtained during screening reveals an immediate risk to public safety, the OSMV may direct ICBC to cancel or restrict a licence without further assessment.

Policy rationale

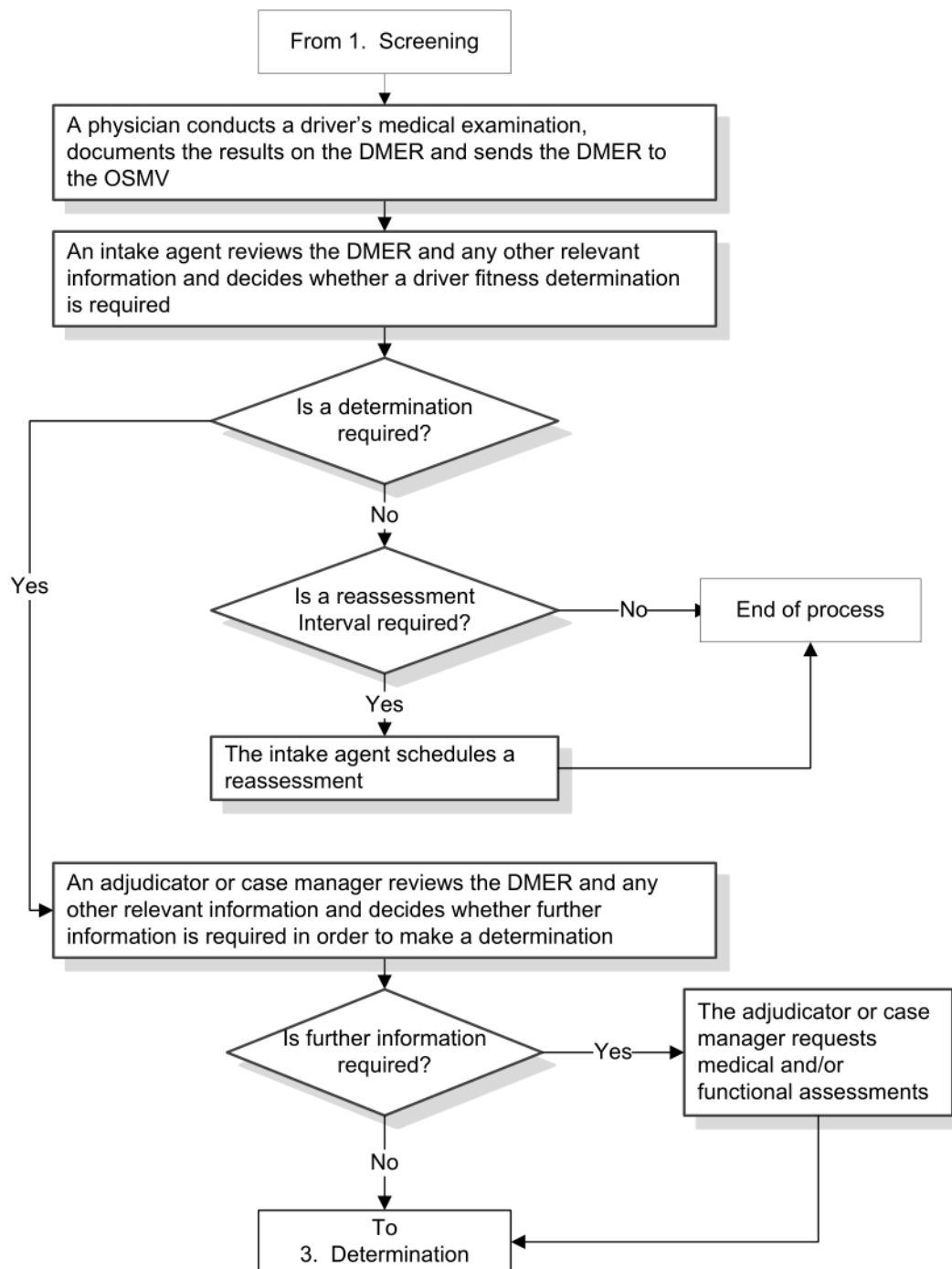
In most cases, the OSMV will not direct ICBC to restrict or cancel a licence based only on the information obtained during screening.

However, there are times when cancellation or restriction may be warranted based on the results of screening. For example, a credible report may indicate that an individual's functional ability to drive is severely impaired. The OSMV would direct ICBC to cancel the driver's licence for public safety reasons and would review the decision once further information was received.

Chapter 6: Assessment Policies and Procedures

6.1 Overview

The flowchart below is an excerpt from the overview flowchart presented in 4.1 that highlights in red the steps that take place during assessment.



During assessment, the OSMV collects the information required to make a driver fitness determination. As the first step in the assessment process, an intake agent reviews the DMER and decides whether the case should be forwarded to a case manager or adjudicator for a determination.

Particularly in the case of commercial or aging drivers, the DMER may indicate that an individual either does not have a medical condition that impairs the functions necessary for driving, or clearly meets the medical condition guidelines. In these cases, further assessment and a driver fitness determination are not required, although a reassessment may be scheduled. Policies and procedures that guide intake agents in performing these tasks are documented in the Intake Agent Guidelines for Assessing Fitness to Drive and are not duplicated here.

If a determination is required, an adjudicator or case manager reviews the applicable medical condition guidelines, the DMER and the results of any assessments on file and decides whether any further information is required in order to make a driver fitness determination. In many cases, the information from a DMER, read in conjunction with the medical condition guidelines applicable to that particular medical condition, will easily allow a determination to be made. In other cases, more information will be required. Although presented in the flowchart as a linear process, this means that assessment and determination may overlap.

To collect additional information, the adjudicator or case manager requests further medical and/or functional assessments. The policies outlined in this chapter, and the guidelines regarding use of assessments included in each medical condition chapter in Part 3 of this Manual, assist case managers and adjudicators in determining the appropriate assessments to request for each individual. OSMV policy on paying for assessments is contained in the Driver Fitness Assessment Payment Policy Manual.

6.2 Assessments will only be requested if necessary to determine fitness

Policy

- 6.2.1 A case manager or adjudicator will only request assessments that are necessary to determine driver fitness. If the information available from the DMER, and any other relevant materials on file, is sufficient for a case manager or adjudicator to determine whether or not a driver is fit, no further assessments will be requested.
- 6.2.2 If, after reviewing the relevant medical condition guidelines, a case manager or adjudicator decides that further information is required in order to make a determination, the case manager or adjudicator will request further assessments.
- 6.2.3 If an individual clearly does not meet the medical condition guidelines for one or more of the individual's identified medical conditions, a case manager or adjudicator will not request further assessments.

Policy rationale

Sections 25 and 29 of the MVA give the Superintendent the authority to request vision tests, medical examinations and other examinations and tests in order to determine an individual's fitness to drive. In order to save time and costs, and lessen the inconvenience, to drivers, physicians and the OSMV, the OSMV will only request an assessment if it is necessary to determine driver fitness.

6.3 Requesting medical assessments

Definitions

Medical assessment

is any kind of assessment that provides information regarding an individual's medical condition and/or their response to, or compliance with, treatment. This includes assessments such as ultrasounds, blood tests and other medical tests that are not requested by the OSMV, but are often submitted by physicians and provide useful information regarding an individual's medical condition.

Policy

- 6.3.1 If a case manager or adjudicator decides that further information regarding an individual's medical condition(s) or the individual's response to, or compliance with, treatment, is necessary in order to make a driver fitness determination, the case manager or adjudicator will request a medical assessment.
- 6.3.2 If a case manager or adjudicator decides to request a medical assessment, the case manager or adjudicator will review the guidelines regarding the use of assessments outlined in the relevant medical condition chapter(s), and the policies outlined in this chapter, and decide which medical assessment(s) to request. The following table lists the medical assessments that the case manager or adjudicator may request.

| Medical assessments |
|---|
| Driver's medical examination (documented on the DMER) |
| Diabetic driver medical examination (documented on the Doctor's Report on Commercial Driver with Diabetes on Insulin) (See guidelines for requesting assessments of diabetic drivers in Chapter 11) |
| Specialist assessments completed by a psychologist, addictions specialist or other medical doctor. (See 6.4 for policies on requesting specialist assessments) |

Policy rationale

To ensure that the OSMV bases its driver fitness determinations on complete and accurate medical information, case managers and adjudicators request additional medical assessments whenever further information regarding an individual's medical condition, or the individual's response to, or compliance with, treatment is required.

6.4 Requesting specialist assessments

Policy

- 6.4.1 A case manager or adjudicator will contact the physician who submitted the DMER if further information on an individual's medical condition, or the individual's response to, or compliance with, treatment is required that may require a specialist assessment.
- 6.4.2 If the physician indicates that:
 - (a) the information can only be provided by a specialist
 - (b) there is no specialist assessment on the individual's file, and
 - (c) a specialist assessment is not medically necessarythe case manager or adjudicator will request a specialist assessment.
- 6.4.3 The case manager or adjudicator will clearly articulate the scope of the required specialist assessment in the request.
- 6.4.4 The case manager or adjudicator will review the policies outlined in the Driver Fitness Assessment Payment Policy Manual to determine the appropriate payment for a specialist assessment.

Policy rationale

Specialist assessments are assessments performed by physicians with a specialization in a particular area of medicine or medical condition. Many individuals are assessed by specialists during the course of the diagnosis and treatment of a medical condition and the OSMV may request and obtain copies of those assessments from the physician who submitted the DMER. However, in some cases, a specialist assessment will not be medically necessary, but will provide further information that is required in order for a case manager or adjudicator to make a determination of driver fitness. Because the OSMV should not pay for specialist assessments that are medically necessary, a case manager or adjudicator will only request a specialist assessment if the physician who completed the initial driver's medical examination indicates that a specialist assessment is not necessary for medical purposes, even though it is necessary for purposes of a driver fitness determination.

6.5 Requesting functional assessments

Definitions

Episodic impairment

is the result of a medical condition that does not have any ongoing measurable, testable or observable impact on the functions necessary for driving but that may result in an unpredictable sudden or episodic impairment. Episodic impairments generally result in sudden incapacitation.

For example, the medical condition that gives rise to the impairment may be testable, e.g. the size of an abdominal aortic aneurysm, or known, e.g. epilepsy, but the precipitating event that negatively impacts the functional ability to drive, e.g. the rupture of the aneurysm or an epileptic seizure, is not predictable. The source of the potential impairment is known and the inevitability of functional impairment is known in the event that the episodic impairment occurs, but when it will occur is not known.

Functional assessment

is any kind of assessment that involves direct observation or measurement of the functions necessary for driving. Functional assessments include:

- paper-pencil tests
- computer-based tests
- eye tests
- hearing tests
- driver rehabilitation specialist assessments, and
- road tests.

Persistent impairment

is an ongoing or continuous impairment to a function necessary for driving. The potential impacts of persistent impairments on the functions necessary for driving are generally measurable, testable and observable. Although the condition may be progressive, the progression is usually slow and sudden deterioration is unlikely. Persistent impairments may be stable, e.g. loss of leg, or progressive, e.g. arthritis.

Policy

- 6.5.1 If a case manager or adjudicator decides that further information on an individual's functional ability to drive is necessary in order to make a driver fitness determination, the case manager or adjudicator will request a functional assessment.
- 6.5.2 If a case manager or adjudicator decides to request a functional assessment, the case manager or adjudicator will review the guidelines regarding the use of assessments outlined in the relevant medical condition chapter(s), and the policies outlined in this chapter, and decide which functional assessment to request. The following table lists the functions necessary for driving and the functional assessments that a case manager or adjudicator may request that can observe or measure that function.

| Driving function | Functional assessments |
|---|---|
| Cognitive (See 6.6 for policies on requesting assessments of cognitive function) | SIMARD-MD (cognitive screen) see 6.6.1 |
| | DriveABLE assessment (in-office and road tests) |
| Motor (including sensorimotor) (See 6.7 for policies on requesting assessments of motor function) | Occupational therapist (OT) or driver rehabilitation specialist assessment which may include an in-office assessment and/or a road test |
| Sensory: hearing (See guidelines for requesting hearing assessments in Chapter 18) | Audiogram (hearing report) |
| Sensory: vision (See guidelines for requesting vision assessments in Chapter 21) | Examination of Visual Functions (EVF) |
| | Visual Field Test (VFT) |
| | OT or driver rehabilitation specialist assessment which may include both an in-office assessment and a road test |

Persistent and episodic impairments

- 6.5.3 A case manager or adjudicator may request a functional assessment of an individual with a persistent impairment. A case manager or adjudicator will not request a functional assessment of an individual who has only episodic impairments.

Multiple functional impairments

- 6.5.4 If a case manager or adjudicator decides that more than one of the functions necessary for driving needs to be assessed, the case manager or adjudicator will request functional assessments in the following order:

- (a) assessments of cognitive function
- (b) assessments of sensory function, and
- (c) assessments of motor function.

If the results of an assessment indicate that an individual's cognitive, sensory or motor function is impaired to the extent that the individual presents a high degree of risk to public safety when driving the types of motor vehicles allowed under the class of licence held or applied for, the case manager or adjudicator will make a driver fitness determination without requesting further assessments of the other functions necessary for driving.

Multiple medical conditions

- 6.5.5 If an individual has multiple medical conditions that result in a cumulative or combined effect on the functions necessary for driving such that the medical conditions cannot be considered individually or independently, a case manager or adjudicator will request functional assessments of each function that may be impaired, even if the medical condition guidelines for each identified medical condition indicate that the individual is fit to drive.

Policy rationale

Consistent with the OSMV's functional approach to driving fitness, a case manager or adjudicator will request an assessment of an individual's functional ability to drive whenever that information is necessary in order to make a driving fitness determination.

Persistent and episodic impairments

Whether or not a functional assessment is appropriate depends upon the type of impairment. Because persistent impairments are measurable, testable and observable, it is possible to assess an individual's functional ability to drive through observation by a physician or other health care practitioner or an OT or driver rehabilitation specialist. Because episodic impairments are not measurable or testable, the OSMV cannot functionally assess how the impairment impacts an individual's ability to drive.

Multiple functional impairments

Some individuals may have impairments to more than one of the functions necessary for driving. In this situation, a case manager or adjudicator prioritizes requests for functional assessments based on the functions that may be impaired. Because there are assessment tools available to specifically measure cognitive impairment as it relates to driving, if an individual's cognitive function may be impaired a case manager or adjudicator will assess that function first. Sensory functions are assessed next, followed by motor functions. If an assessment indicates that a function is impaired, a driver is not fit to drive and there is no need to continue with further assessments of the other functions that may be impaired.

Multiple medical conditions

The impact of multiple medical conditions on functional ability to drive is very important when making determinations about fitness to drive. Research results indicate that drivers with multiple medical conditions are, in general, at higher risk for crashes and at-fault crashes than those with a single medical condition.

The medical condition chapters in Part 3 of this Manual each focus on a single medical condition, e.g. cardiovascular disease, and the guidelines are written as if an individual only had one medical condition. This is because the number of combinations of illnesses and medications is simply too large to make reliable and valid driving guidelines that could support making decisions about driving fitness for specific individuals.

This means that the medical condition guidelines cannot always be relied upon in order to make a driver fitness determination for an individual with more than one medical condition. While the guidelines for each individual medical condition may indicate that the driver is fit to drive, if the medical conditions have a cumulative effect on the functional ability to drive, the individual may, in fact, not be fit. Therefore, the OSMV always requests

functional assessments of individuals with multiple medical conditions that cannot be considered independently, unless the medical condition guidelines for any of the identified medical conditions clearly indicate that the individual is not fit to drive.

6.6 Requesting assessments of cognitive function

Policy

- 6.6.1 A case manager or adjudicator will request a DriveABLE assessment of an individual with a persistent cognitive impairment who scores **X** or higher on the Screen for Identification of Medically-at-risk Drivers, a Modification of the DemTect (SIMARD-MD).
- 6.6.2 In exceptional circumstances, e.g. if a DriveABLE assessment centre is not accessible to the individual, a case manager or adjudicator may request an OT or driver rehabilitation specialist assessment, or a gerontologist assessment, of an individual with a persistent cognitive impairment who scores **X** or higher on the SIMARD-MD.

Policy rationale

SIMARD-MD

Historically, there has been a lack of reliable screening tools for the identification of individuals whose cognitive impairment or dementia poses a risk for adverse driving outcomes. Scores on mental status tests such as the Mini Mental Status Exam (MMSE) often are used for making decisions about driving competency. The 2008 CCMTA Medical Standards for Drivers advises that individuals who score 15 or less on an MMSE are not fit to drive, while a score above 15 may require further assessment. However, there is now a significant amount of evidence indicating that, while the MMSE and similar tests are useful as tools for identifying cognitive decline, they are not good predictors of an individual's driving competence, particularly for those whose cognitive impairment is less severe. In addition, the scores of these tools are very sensitive to language ability and education.

Standard neuropsychological or cognitive tests such as Trails A, Trails B, Digit Span, or the MOCA (Montreal Cognitive Assessment), designed to assess cognitive functions (e.g. attention, memory, executive functioning)

also are used for decision making about driving competency. However, although these standardized tests sometimes correlate with measures of driving performance (e.g., on-road performance, crash rates), the absence of a strong and consistent relationship, as well as the lack of established cutpoints for categorizing drivers as 'safe' and 'unsafe', preclude using these tests for determination of driving competency at this time.

Recent research has focused on the development of a battery of tests using complex cognitive tasks (tasks that require the use of multiple cognitive functions simultaneously), hypothesizing that this type of testing would be a better predictor of driving performance. This research has led to the development of a new screening tool called the SIMARD-MD.

The SIMARD-MD is a five minute, paper and pencil screening test, which can be easily administered and scored in a doctor's office or other health care setting. Using the established cutpoints (i.e., scores), the SIMARD-MD has demonstrated high levels of sensitivity (accurately identifying those who would fail an on-road assessment) and specificity (accurately identifying those who would pass an on-road assessment) in a large sample of healthy and cognitively impaired individuals.

The OSMV has adopted the SIMARD-MD for use by health care professionals to screen individuals who may have cognitive impairment or dementia that could affect their ability to drive. If an individual scores **X** or higher on the SIMARD-MD, their cognitive ability to drive may be impaired. In this situation, a case manager or adjudicator must request further assessment of the individual's cognitive function, either through a DriveABLE assessment or, if a DriveABLE assessment centre is not located nearby, a gerontologist, OT or driver rehabilitation specialist assessment.

DriveABLE

The DriveABLE assessment is specifically designed to identify cognitive impairments in experienced drivers. The first component is an in-office assessment conducted by a qualified DriveABLE assessor that requires the driver to complete a series of tasks on the computer. Those in the most dangerous and most competent ranges are identified through automated scoring procedures and do not require further assessment. Drivers who score in the indeterminate range proceed to a road test for the second stage of the assessment. The road test is different from regular road tests and administered by a qualified DriveABLE evaluator. The road course was

developed to reveal errors made by drivers who have become unsafe due to declines in cognitive abilities.

6.7 Requesting assessments of motor function

Policy

- 6.7.1 A case manager or adjudicator will request an OT or driver rehabilitation specialist assessment if further information is required on an individual's motor function.
- 6.7.2 Generally, further information on an individual's motor function will be required when a medical assessment indicates that there is some loss of motor function and:
- (a) it is unknown whether the individual possesses sufficient movement and strength to perform the motor functions necessary for driving the types of motor vehicles permitted under the class of licence held or applied for
 - (b) it is unknown whether pain associated with a medical condition, or the medications used to treat a medical condition, adversely affect the individual's motor function, and/or
 - (c) it is unknown whether the individual can safely operate the type of motor vehicles permitted under the class of licence held or applied for using the vehicle modifications and devices that may be required to compensate for their functional impairment.

Policy rationale

Occupational therapists and other specialists with expertise in driver rehabilitation are trained to perform both in-office and on-road assessments of an individual's functional ability to drive. In particular, driver rehabilitation specialists are trained to evaluate an individual's ability to compensate for motor deficits during simulated and on-road testing and determine requirements for adaptive driving equipment and vehicle modifications.

6.8 Time period during which assessments are valid

Policy

- 6.8.1 Generally, a case manager or adjudicator will accept the results of any assessment conducted within the previous one-year period, even if completed for another purpose, as long as it provides the case manager or adjudicator with the required information.

Policy rationale

Assessments may be costly and time-consuming for drivers, the OSMV and health care providers. If an assessment has already been conducted that provides a case manager or adjudicator with the information required for a driver fitness determination, there is no need for an individual to be re-assessed, so long as the results of the assessment are still reliable. Because many conditions are progressive, and an individual's abilities may change over time, assessment results generally only continue to be reliable for a period of one year after completion of the assessment.

6.9 Time limits for drivers to complete assessments

Policy

- 6.9.1 Whenever a case manager or adjudicator requests an assessment, the case manager or adjudicator will inform the individual of the time period within which the assessment must be completed.
- 6.9.2 A case manager or adjudicator will allow an individual 30 days to comply with a request for an
- (a) Examination of Visual Functions
 - (b) Visual Field Test
 - (c) Hearing Report, or
 - (d) DriveABLE assessment.
- 6.9.3 A case manager or adjudicator will allow an individual 45 days to comply with a request for a driver's medical examination or other medical assessment.

- 6.9.4 A case manager or adjudicator will allow an individual 60 days to comply with a request for an OT or driver rehabilitation specialist assessment.
- 6.9.5 Upon request, a case manager or adjudicator may extend the time period for an individual to comply with a request for an assessment. In considering whether to extend the time period, the case manager or adjudicator will consider information from the individual regarding the circumstances that necessitate an extension, such as
- (a) work commitments
 - (b) the individual's location,
 - (c) the individual's degree of mobility, and/or
 - (d) availability of assessors.
- 6.9.6 If an individual does not comply with a request for an assessment within the time period or extension set by a case manager or adjudicator:
- (a) the case manager or adjudicator will direct ICBC to cancel the individual's driver's licence, in the case of an individual who is already licensed, or
 - (b) ICBC will not grant a licence, in the case of an individual who has applied for a licence.

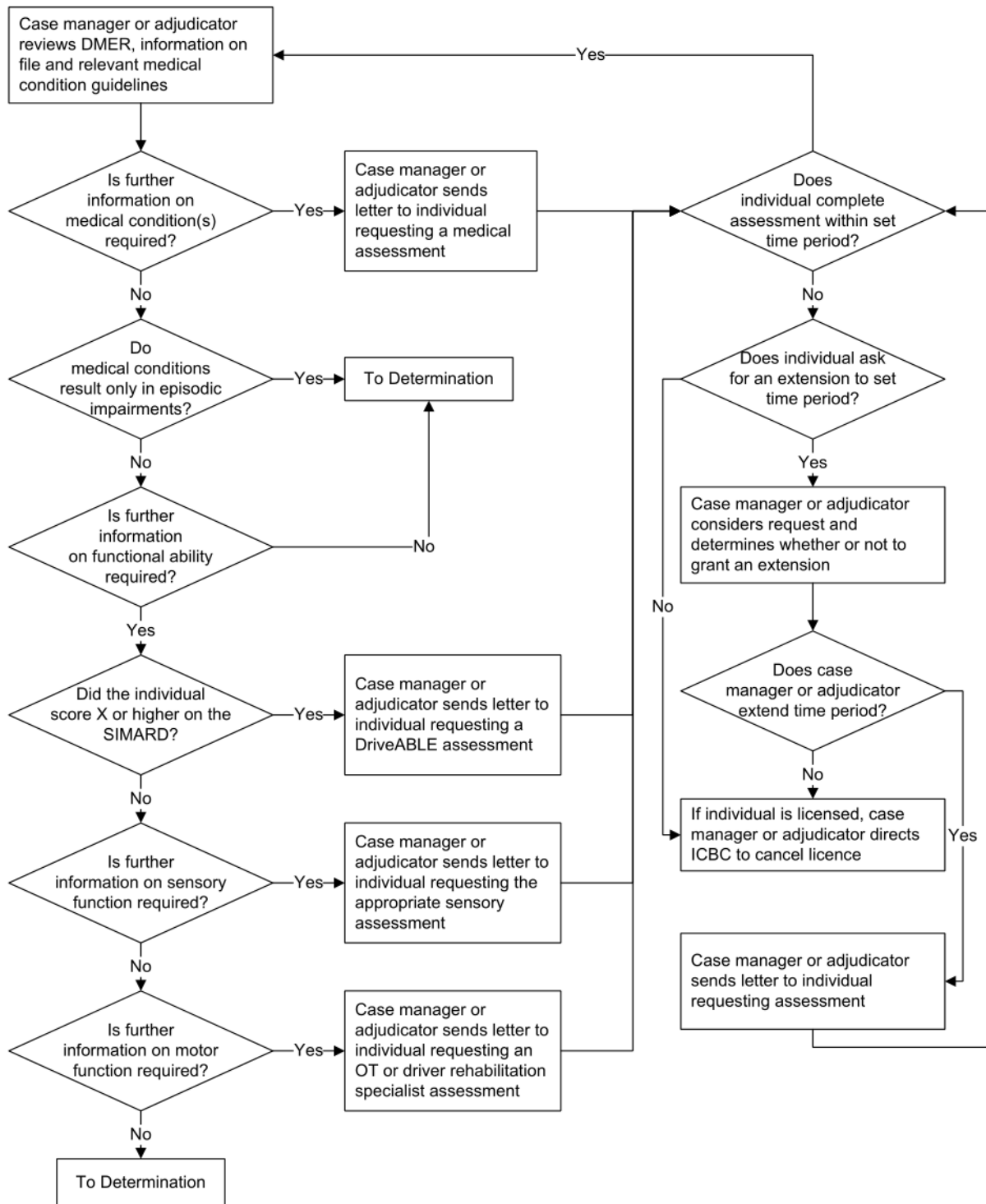
Policy rationale

Both for public safety and administrative fairness reasons, driver fitness determinations must be made as soon as possible after an individual is identified through screening. Where further information is required in order to make a determination, this means that individuals must comply with requests for assessments in a timely fashion. The OSMV has set time limits in policy, based on the typical time required to comply with a request for an assessment, considering such factors as assessor availability and the variability of individual schedules. If an individual does not comply with a request for an assessment, the OSMV has the authority under section 92 of the MVA to direct ICBC to cancel a licence.

6.10 Assessment procedures

The flowchart on the following page graphically represents the procedures associated with the assessment process. Because the procedures that guide intake agents are documented elsewhere, the only procedures outlined in this manual are those that guide the work of case managers and adjudicators.

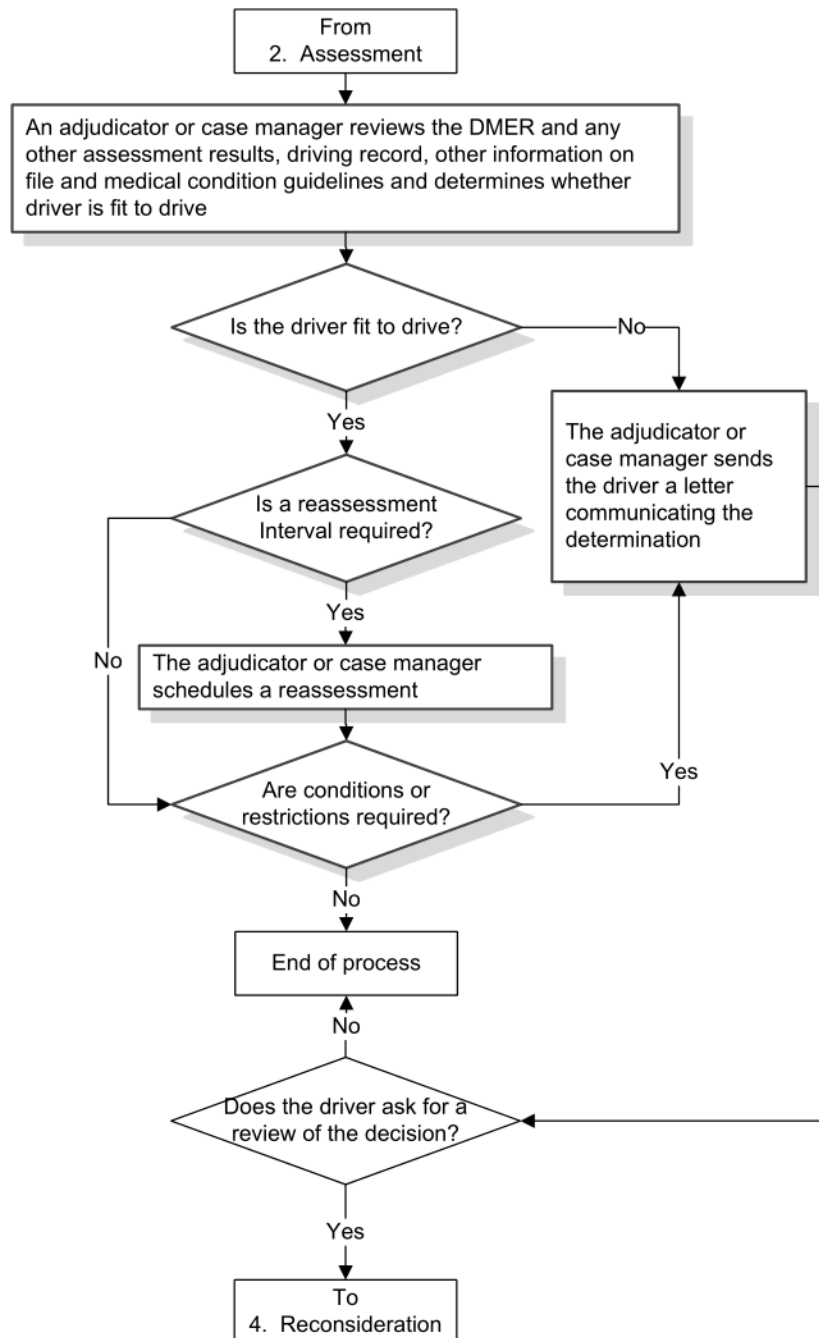
ASSESSMENT PROCEDURES



Chapter 7: Determination Policies and Procedures

7.1 Overview

The following flowchart is an excerpt from the overview flowchart presented in 4.1 that highlights in red the steps involved in determination.



A driver fitness determination is any decision regarding fitness to drive that requires the exercise of discretion. Determinations are made by adjudicators and case managers. To make a driver fitness determination, a case manager or adjudicator considers the information collected through assessment, as well as any other relevant information on file, and determines whether an individual is fit to drive the types of motor vehicles permitted under the licence class held or applied for. The determination may also include a decision to impose restrictions or conditions. If an individual is fit to drive, the case manager or adjudicator will also decide whether reassessment at a future date is required.

The factors that are relevant to a driver fitness determination for a particular individual vary somewhat depending upon whether the individual has a persistent or episodic impairment, the function that is impaired, whether conditions and/or restrictions may be appropriate and the types of vehicles the individual wishes to drive. The policies outlined in this chapter, and the medical condition guidelines outlined in the medical condition chapters in Part 3, provide guidance to case managers and adjudicators in considering these factors and making driver fitness determinations.

7.2 Components of driver fitness determinations

Definitions

Fit to drive

means that an individual's motor, sensory and cognitive functions are sufficient to drive safely

Policy

- 7.2.1 As part of each driver fitness determination, a case manager or adjudicator will determine:
- (a) whether an individual is fit to drive the types of motor vehicles allowed under the class of licence held or applied for
 - (b) whether any restrictions or conditions are required in order for an individual to be fit to drive the types of motor vehicles allowed under the class of licence held or applied for (see 7.9 for policies on imposing restrictions and conditions), and

- (c) if the individual is fit to drive, whether reassessment at a future date will be required (see 7.11 for policies on determining whether reassessment is required and setting reassessment intervals).

Policy rationale

A driver fitness determination may include several components. Whether an individual is fit to drive may be dependent upon whether an individual is able to compensate for their functional impairment, or reduce the probability or consequence of functional impairment, through the use of adaptive devices or compliance with a prescribed treatment regime or medications. In order to give individuals the maximum licensing privilege that is consistent with public safety, a case manager or adjudicator may decide in this situation to give restricted or conditional driving privileges to individuals who would otherwise not be fit to drive.

Medical conditions and their effects often change over time. In order to give individuals the maximum licensing privilege for which they are currently fit, while ensuring that any change in an individual's level of impairment is identified and acted upon, a driver fitness determination will include a determination of whether reassessment is required for all individuals who are fit to drive.

7.3 Making driver fitness determinations for persistent and episodic impairments

- 7.3.1 A case manager or adjudicator will make a driver fitness determination for an individual with a persistent impairment based on evidence of functional impairment.
- 7.3.2 A case manager or adjudicator will make a driver fitness determination for an individual with an episodic impairment based on the risk of functional impairment.

Policy rationale

Because individuals with episodic impairments are not continuously impaired, case managers and adjudicators cannot make determinations for individuals with episodic impairments based on evidence of functional impairment. Instead, they must rely on a risk analysis that takes into account the probability and consequence of impairment when making a driver fitness determination for an individual with an episodic impairment. To assist case managers and adjudicators in performing this analysis, the medical condition guidelines for medical conditions that result in episodic impairments incorporate expert opinion regarding the risk of functional impairment.

7.4 Making driver fitness determinations for individuals whose cognitive ability to drive may be persistently impaired

Policy

- 7.4.1 If an individual scores **X** or lower on the SIMARD-MD, the individual's cognitive function is sufficient to drive safely.
- 7.4.2 If an individual passes a DriveABLE in-office or road test assessment, the individual's cognitive function is sufficient to drive safely.
- 7.4.3 If an individual fails a DriveABLE in-office or road test assessment, the individual's cognitive function is not sufficient to drive safely and the individual is not fit to drive.

Policy rationale

As outlined in 6.6, the SIMARD-MD cognitive screen and DriveABLE assessment have been specifically developed to identify impairment of cognitive ability to drive. This means that driver fitness determinations for individuals whose cognitive ability to drive may be persistently impaired can be based on the results of these assessments alone, unless the individual also has possible impairment of their motor or sensory functions.

7.5 Making driver fitness determinations for individuals whose motor or sensory function may be impaired or who may have episodic impairment of cognitive function

7.5.1 When making a driver fitness determination for an individual whose motor or sensory function may be impaired, or who may have episodic impairment of cognitive function, a case manager or adjudicator will review and consider:

- (a) information obtained through medical assessments
- (b) information obtained through any functional assessments
- (c) the individual's driving record (see 7.6 for policies on considering driving records)
- (d) specific driving or safety requirements associated with the types of motor vehicles that the individual wishes to drive (see 7.7 for policies on considering specific driving or safety requirements), and
- (e) the medical condition guidelines for the identified medical conditions.

7.5.2 Generally, an individual whose motor or sensory functions may be impaired, or who may have episodic impairment of cognitive function, is fit to drive if:

- (a) the medical condition guidelines for the class of licence held or applied for indicate that they are fit to drive
- (b) the results of any functional assessments indicate that the individual's sensory, motor and cognitive functions are sufficient to safely drive the types of motor vehicles allowed under the class of licence held or applied for
- (c) the individual's driving record doesn't indicate that the identified medical conditions impair the functions necessary for driving to the extent that the individual presents a high degree of risk to public safety when driving the motor vehicles allowed under the class of licence held or applied for, and
- (d) there is no indication that the individual will be non-compliant with any restrictions or conditions that are required in order for the individual to be fit to drive (see 7.10 for policies on assessing future compliance with restrictions or conditions).

- 7.5.3 Generally, an individual whose motor or sensory functions may be impaired, or who may have episodic impairment of cognitive function, is not fit to drive if:
- (a) the medical condition guidelines for the class of licence held or applied for indicate that they are not fit to drive
 - (b) the results of any recent functional assessments indicate that the individual's sensory, motor or cognitive functions are impaired to the extent that the individual presents a high degree of risk to public safety when driving the types of motor vehicles allowed under the class of licence held or applied for
 - (c) the individual's driving record indicates that the identified medical conditions impair the functions necessary for driving to the extent that the individual presents a high degree of risk to public safety when driving the motor vehicles allowed under the class of licence held or applied for, and/or
 - (d) the individual is not likely to be compliant with any restrictions or conditions that must be imposed in order for the individual to be fit to drive (see 7.10 for policies on assessing future compliance with restrictions or conditions).

Policy rationale

Except for individuals with persistent impairment of cognitive function, there are no assessment tools available that can be relied upon to indicate whether an individual is fit to drive. This means that case managers and adjudicators must review information from a variety of sources and exercise discretion and judgment when determining driver fitness for individuals with other types of impairments.

Case managers and adjudicators will generally rely on the medical condition guidelines to make driver fitness determinations. However, because each individual is unique, and individuals may have multiple medical conditions or medical conditions which are not included in this Manual, case managers and adjudicators also review and consider an individual's driving record and the results of any functional assessments when determining whether an individual is fit to drive.

In general, if a review of this information for an individual with a persistent impairment indicates no functional impairment, or a level of functional impairment that does not impact the individual's ability to drive safely, the individual is fit to drive. For individuals with episodic

impairments, if a review of this information indicates a low risk of functional impairment, the individual is fit to drive.

Where any of this information indicates that the individual presents a high degree of risk to public safety, the individual is not fit to drive. In the case of an individual with a persistent impairment, this would be because the level of impairment means the individual cannot drive safely. In the case of an individual with an episodic impairment, this means that the risk, or probability and consequence, of an episodic impairment is high.

7.6 Reviewing driving records

Definitions

Driving record

includes:

- the length of time an individual has been licensed
- driving offences
- driving sanctions applied
- current and past licence restriction(s)
- motor vehicle related Criminal Code convictions
- crash history, and
- past road test results.

Policy

7.6.1 During every driver fitness determination, the case manager or adjudicator will review the individual's driving record for any information that indicates whether the identified medical conditions impair the functions necessary for driving.

- 7.6.2 In particular, the case manager or adjudicator will review:
- (a) whether there has been a deterioration, improvement or no change in driving safety (i.e. crashes, penalty points and infractions) that can be linked to:
 - the date of onset
 - the date of diagnosis, and/or
 - the date the individual began a new treatment regime, prescribed medication or compensation strategy, and
 - (b) any evidence on file (e.g. police reports) that indicates that incidents were related to the individual's medical conditions.

Policy rationale

An individual's driving record may indicate that a medical condition is affecting their functional ability to drive. A lengthy, clean driving record for a driver with a long-standing medical condition may be evidence of:

- a low level of impairment
- an ability to compensate, or
- a condition that is well controlled.

A driving record with multiple crashes may indicate functional impairment.

7.7 Considering specific driving or safety requirements

Policy

When determining whether an individual is fit to drive the types of motor vehicles allowed under a commercial class of licence, a case manager or adjudicator will consider:

- (a) the number of hours an individual with that type of licence typically spends driving
- (b) any physical requirements (e.g., load securement) associated with the operation of motor vehicles allowed under that type of licence, and
- (c) any information provided by the individual or the individual's employer regarding:
 - the types of vehicles they will be operating, and
 - how many passengers they will carry and for what purpose.

Policy rationale

The class of licence held or applied for is a key consideration when making a driver fitness determination. Professional drivers who operate passenger carrying vehicles, trucks and emergency vehicles spend many more hours at the wheel than drivers of private vehicles. Professional drivers may also be called upon to undertake heavy physical work such as loading or unloading their vehicles, realigning shifted loads and putting on and removing chains.

Because the physical and endurance requirements for commercial drivers are generally more onerous than for private drivers, the medical condition guidelines outlined in Part 3 of this Manual often specify different guidelines for commercial and private drivers. Where the medical condition guidelines do not apply, or where an individual provides specific information about their employment, a case manager or adjudicator will consider the factors listed above when determining whether a commercial driver is fit to drive. Where an individual indicates that they will only be operating certain types of vehicles typically allowed under that licence class, or only operating vehicles under certain circumstances, imposition of a restriction or condition may make an individual fit to drive.

7.8 Considering whether an individual can compensate

Definitions

Compensation

is the use of strategies or devices by a driver with a persistent impairment to compensate for the functional impairment caused by a medical condition. Treatment for a condition, e.g. medication, is not a type of compensation. Where available or known, possible compensation strategies for each medical condition are included in the medical condition chapters in Part 3 of this Manual.

Policy

7.8.1 The case manager or adjudicator will consider whether an individual can compensate for their functional impairment when making a driver fitness determination.

7.8.2 An individual cannot compensate for an episodic impairment.

7.8.3 Whether an individual can compensate for a persistent impairment depends upon the functional ability that is impaired. Individuals with impairments in motor function, vision or hearing may be able to compensate for those impairments. Individuals with progressive or irreversible declines in cognitive function cannot compensate for a cognitive impairment.

7.8.4 In general, an individual who can compensate for their functional impairment is fit to drive.

Policy rationale

In some situations, individuals who would otherwise not be fit to drive have learned strategies, or utilize devices, that reduce or eliminate their functional impairment. For example:

- a driver with limited peripheral vision may use the strategy of turning their neck to the left and right to ensure they have a full field of view, or
- a driver who is unable to use their lower limbs may have their vehicle modified for hand controls.

In keeping with the decision in *Grismer*, and the guiding principles of the Driver Fitness Program, the OSMV makes driver fitness determinations on an individual basis, based on the results of individual assessments. In general, if a review of individual assessment results and the individual's driving record indicates that an individual is able to compensate for their functional impairment, the individual is fit to drive.

7.9 Imposing restrictions and/or conditions

Definitions

Condition

means a condition that is imposed on an individual by the OSMV. Unlike restrictions, which are placed on a licence and enforceable at roadside, conditions are placed on a driver and are not enforceable at roadside. Examples of conditions are 'do not drive if your blood sugar drops below 4mmol/L,' or 'do not drive if your dialysis treatment is delayed.'

Restriction

means a restriction that is printed on a driver's licence and is enforceable at the roadside through fines. Non-compliance with a restriction is an offence.

Restrictions are commonly used for impairments where a driver can compensate. However, on occasion they may be used for impairments for which a driver cannot compensate. Examples of restrictions where a driver can compensate for their persistent impairment are 'wear corrective lenses', 'must only drive modified vehicle with steering knob' and 'use oversized mirrors.' A restriction where a driver cannot compensate would be 'do not drive at night' for persistent night blindness.

Policy

7.9.1 Where applicable, a case manager or adjudicator will refer to the medical condition guidelines to identify the restrictions and/or conditions that may be required in order for an individual with the identified medical conditions to be fit to drive.

Restrictions

7.9.2 If a case manager or adjudicator decides that an individual must:

- (a) only operate vehicles during daylight hours
- (b) only operate certain types of vehicles
- (c) only operate vehicles in certain geographic areas
- (d) only operate vehicles under a certain speed
- (e) only carry certain types of cargo
- (f) wear specific devices, and/or
- (g) use specific vehicle modifications or adaptations

in order to be fit to drive, the case manager or adjudicator will impose those restrictions on the licence.

The following table lists the restrictions used by the Driver Fitness Program.

| Code | Description |
|-------------|--|
| 12 | Restricted to daylight hours only |
| 14 | No Hwy 99 S of Van or Hwy 1E of Van or W of Hwy 99 |
| 15 | Permitted to operate vehicles with air brakes |
| 16 | Not permitted to operate class 2 or 4 |
| 17 | Not permitted to operate buses |
| 18 | Permitted to operate single trucks with air brakes on industrial roads |
| 19 | Permitted to operate truck trailer with air brakes on industrial roads |
| 20 | Permitted to operate trailer of any GVW without air brakes |
| 21 | Corrective lenses required |
| 23 | Hearing aid required with class 1,2,3,4 or for 18/19 |
| 24 | Class 6 or 8 restricted to motor scooters |
| 25 | Fitted prosthesis/leg brace required |
| 26 | Specified vehicle modifications required |
| 28 | Restricted to automatic transmission |
| 35 | Not permitted to exceed 60 km/hr |
| 36 | Not permitted to exceed 80 km/hr |
| 37 | Not permitted to transport dangerous goods |
| 51 | Other – specify type of restriction |

7.9.3 A case manager or adjudicator will not impose restrictions on an individual who only has episodic impairments.

Conditions

7.9.4 If a case manager or adjudicator decides that an individual must:

- (a) stop driving in specific circumstances
- (b) take prescribed medications
- (c) comply with a specific treatment regime, and/or
- (d) attend medical follow-up

in order to be fit to drive, the case manager or adjudicator will impose those conditions on the individual.

7.9.5 A case manager or adjudicator may impose conditions on individuals with persistent or episodic impairments.

Unique restrictions or conditions

7.9.6 Imposition of restrictions or conditions other than those listed above must be approved by the Assistant Director of Hearings and Fair Practices.

Policy rationale

Section 25 (12) of the MVA gives the Superintendent the authority to place any restrictions or conditions on a person's licence that the Superintendent considers necessary for the operation of a motor vehicle by the person. Generally, case managers and adjudicators will refer to the medical condition guidelines to determine the conditions and/or restrictions that are required. However, because the medical condition guidelines may not always apply in individual circumstances, the types of restrictions and conditions that are appropriate for driver fitness determinations are also outlined in this policy. The appropriate types of restrictions and conditions are limited to ensure that they are supported by driver fitness research and Driver Fitness Program policy. Also, in the case of restrictions, they must be enforced easily at roadside.

7.10 Considering compliance with conditions or restrictions

Definitions

Insight

means that a driver:

- is aware of their medical condition
- understands how the condition may impair their functional ability to drive, and

- has the judgment and willingness to comply with their treatment regime and any conditions or restrictions imposed by the OSMV.

Physicians will often use terms such as “impaired awareness,” “decreased metacognition,” or “lack of awareness regarding deficits” on a medical assessment to indicate that an individual lacks insight.

An individual’s level of insight is a critical consideration when assessing the risk of an episodic impairment of functional ability due to a psychiatric disorder. Because of this, there is a specific guideline regarding insight in the Psychiatric Disorders chapter.

Policy

7.10.1 If a case manager or adjudicator decides that restrictions and/or conditions are required in order for an individual to be fit to drive, the case manager or adjudicator will review:

- (a) medical assessments on file for information that indicates that the individual has, or lacks, insight into their medical condition or its impact on the functions necessary for driving
- (b) medical assessments on file for information that indicates that the individual is non-compliant with their prescribed treatment regime or medications
- (c) the individual’s driving record for any information that indicates the individual has been non-compliant with restrictions or conditions in the past, and
- (d) any credible reports for information that indicates that the individual has been non-compliant with restrictions or conditions in the past.

7.10.2 Without information to the contrary, a case manager or adjudicator will assume that an individual will comply with a restriction or condition. However, if the information obtained from this review indicates that the individual is not likely to be compliant with any restrictions and/or conditions that are required in order to be fit to drive, the case manager or adjudicator will not impose the restriction or condition and the individual is not fit to drive.

Policy rationale

A key consideration when determining whether or not a restriction or condition is appropriate is whether an individual is likely to comply with the restriction or condition. Because restrictions or conditions are only imposed if required for driver fitness, if a case manager or adjudicator decides that an individual is not likely to comply with the condition or restriction, the individual is not fit to drive.

One key factor for determining whether an individual is likely to comply with restrictions or conditions is the individual's level of insight. This is because individuals with good insight are more likely to be diligent about their treatment regime, to seek medical attention when needed, and to avoid driving when their condition is likely to impair their functional ability to drive.

7.11 Determining reassessment intervals

Definitions

Reassessment

is the process of screening, assessment and determination for an individual with a previously reported medical condition. Reassessment is initiated when a request for a driver's medical examination or an EVF is sent to an individual at the expiration of an OSMV-scheduled reassessment interval.

Policy

7.11.1 If a case manager or adjudicator determines that an individual is fit to drive, or downgrades a commercial licence, the case manager or adjudicator will also determine whether reassessment is required at a future date and, if so, what the reassessment interval should be.

7.11.2 Generally, reassessment will be required if:

- (a) the individual has a medical condition that is progressive
- (b) the driver fitness determination is based upon the effectiveness of a prescribed treatment regime and it is unknown whether the treatment regime is likely to continue to be effective
- (c) the driver fitness determination is based upon the effectiveness of a prescribed treatment regime and it is unknown whether the individual is likely to comply with the treatment regime
- (d) the medical condition results in episodic impairment, the driver fitness determination is based upon an individual having a period of stability without an episodic event, and it is unknown whether the medical condition is likely to continue to be stable
- (e) the medical condition results in an episodic impairment, the driver fitness determination is based upon a pattern of episodes, e.g. nocturnal seizures or auras, and it is unknown whether the pattern of episodes is likely to continue
- (f) it is recommended by a physician, and/or
- (g) the reassessment interval guidelines for the medical condition indicate that reassessment is required.

7.11.3 To determine whether reassessment is required and, if so, the appropriate interval, the case manager or adjudicator will consider:

- (a) the reassessment interval guidelines outlined in the relevant medical condition chapter(s)
- (b) the date of onset, diagnosis and/or treatment of the medical condition, if known
- (c) the severity of the medical condition
- (d) whether the condition is stable and, if so, the period of stability
- (e) whether the condition is progressive and, if so, the rate of progression
- (f) whether the condition is controlled

- (g) if the individual is a commercial or aging driver, the date of the next scheduled routine screening
- (h) whether the individual has been compliant with any prescribed treatment regime, conditions or restrictions
- (i) the results of any functional assessments
- (j) the individual's driving record, and/or
- (k) the recommendation of a physician.

7.11.4 A case manager or adjudicator will not schedule a reassessment interval for a private driver aged 80 or over, or a commercial driver, if the individual's next scheduled routine screening will provide the OSMV with the necessary opportunity for reassessment.

7.11.5 A case manager or adjudicator can set any reassessment interval that is appropriate for a particular individual. Generally, a case manager or adjudicator will set a reassessment interval at either:

- (a) 1 year
- (b) 2 years
- (c) 3 years, or
- (d) 5 years.

7.11.6 Generally, a case manager or adjudicator will set a reassessment interval at 1 year if:

- (a) an individual's cognitive function is impaired and the level of cognitive impairment is likely to increase over time
- (b) the driver fitness determination is based upon the effectiveness of a prescribed treatment regime and it is unknown whether the treatment regime is likely to continue to be effective
- (c) the driver fitness determination is based upon the effectiveness of a prescribed treatment regime and it is unknown whether the individual is likely to comply with the treatment regime
- (d) the medical condition results in episodic impairment, the driver fitness determination is based upon an individual having a period of stability without an episodic event, and it is unknown whether the medical condition is likely to continue to be stable

- (e) the medical condition results in an episodic impairment, the driver fitness determination is based upon a pattern of episodes, e.g. nocturnal seizures or auras, and it is unknown whether the pattern of episodes is likely to continue

7.11.7 In most other circumstances where reassessment is required, a case manager or adjudicator will schedule a 2, 3 or 5 year reassessment interval, depending upon the likely rate of progression of the medical condition.

Policy rationale

The OSMV schedules reassessments intervals for individuals who are fit to drive at the time of a driver fitness determination, but whose fitness to drive should be examined again at a future date. Without a reassessment requirement, these individuals may not again be brought to the attention of the OSMV until their functional ability to drive has deteriorated to the point that they pose a high degree of risk to public safety. Reassessment intervals may be scheduled for both private and commercial drivers but, to ensure that individuals are not reassessed unnecessarily, the OSMV will not schedule a reassessment interval for a private driver aged 80 or over, or a commercial driver, if the next scheduled routine screening will provide the OSMV with sufficient opportunity for reassessment.

To ensure that individuals are not reassessed unnecessarily, OSMV policy sets out the circumstances when reassessment may be required. For individuals with persistent impairments, reassessment may be required because their level of functional impairment may increase due to:

- a progression of their medical condition(s), and/or
- a change in their response to, or compliance with, treatment.

For individuals with episodic impairments, reassessment may be required because their risk of functional impairment may increase due to:

- a progression in their medical condition(s)
- a change in their response to, or compliance with, treatment
- a change in stability, and/or
- a change in the pattern of episodes.

The medical condition chapters provide guidelines for setting reassessment intervals for individuals with each medical condition. For some conditions, the recommended interval is provided in the guidelines. In those circumstances where a recommended interval is not provided, or where individual circumstances may require a different interval, e.g. when the individual has multiple medical conditions, the case manager or adjudicator reviews a variety of information to determine whether the individual's level or risk of functional impairment may increase and the time period over which this increase may take place.

Reassessment intervals of less than 1 year are generally not scheduled, because the majority of medical conditions do not substantially progress in such a short period of time. Because of the rapid decline in cognitive function associated with many conditions, one year intervals are usually scheduled for individuals with cognitive impairments. One year intervals are also scheduled for individuals with episodic impairments where it is unknown if the stability of the condition, the pattern of episodes or the effectiveness of treatment is likely to change. This is because a period of one year is usually sufficient to determine whether such a change is likely to occur in future.

7.12 Communicating a decision

Policy

Informing drivers of determinations

7.12.1 A case manager or adjudicator will send an individual a letter that describes the driver fitness determination, the reasons for the determination and the reconsideration process if the case manager or adjudicator decides that:

- (a) an individual is not fit to drive
- (b) conditions must be imposed on an individual, or
- (c) restrictions must be imposed on an individual's licence.

Informing ICBC of determinations

7.12.2 A case manager or adjudicator will direct ICBC to cancel a licence if a driver fitness determination indicates that an individual is not fit to drive and the individual currently holds a licence.

7.12.3 A case manager or adjudicator may direct ICBC to issue a class 5 licence to an individual who holds a commercial licence if the case manager or adjudicator determines that the individual is not fit to drive commercial vehicles but is fit to drive private vehicles.

7.12.4 A case manager or adjudicator will inform ICBC that an individual is not fit to be licensed if a driver fitness determination indicates that an individual is not fit to drive and the individual does not currently hold a licence.

Policy rationale

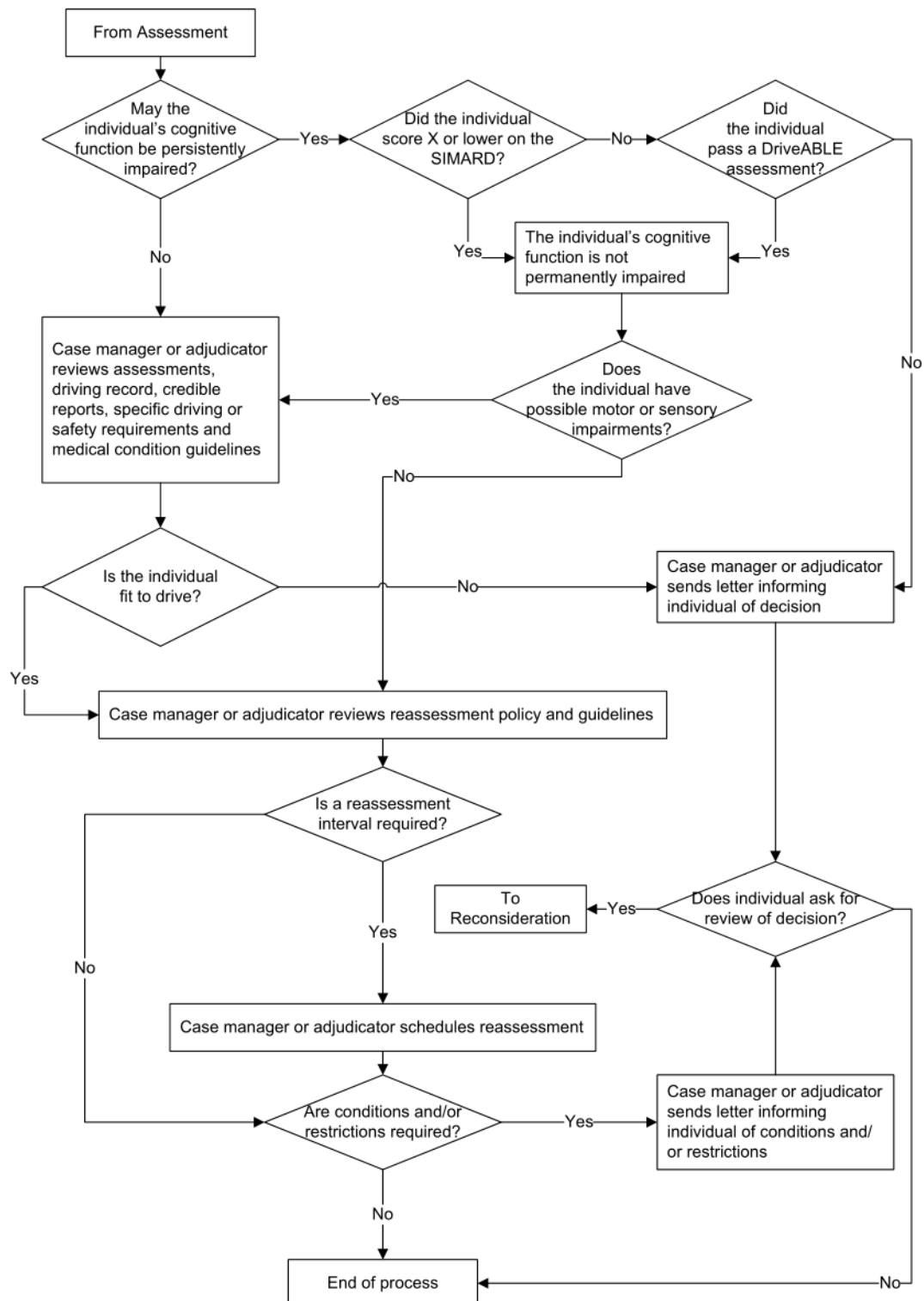
Both for administrative fairness and public safety reasons, an individual must be informed of a driver fitness determination that affects their licensing privileges, the reasons for the determination and the process for requesting a reconsideration of a determination. If conditions or restrictions are imposed, individuals must be made aware of the conditions or restrictions so that they are able to comply with them in the future. If a licence is cancelled, the individual must be told to stop driving and surrender their licence.

If the OSMV determines that an individual is not fit to hold a licence of a particular class, under section 92 of the MVA the Superintendent may direct ICBC to cancel an individual's licence. Because the medical condition guidelines often specify different standards for commercial and private drivers, an individual may be fit to drive private vehicles, even though they are not fit to drive commercial vehicles. In this situation, a case manager or adjudicator may direct ICBC to issue a class 5 licence after cancelling an individual's commercial licence.

7.13 Determination procedures

The following flowchart graphically illustrates the procedures associated with the determination process.

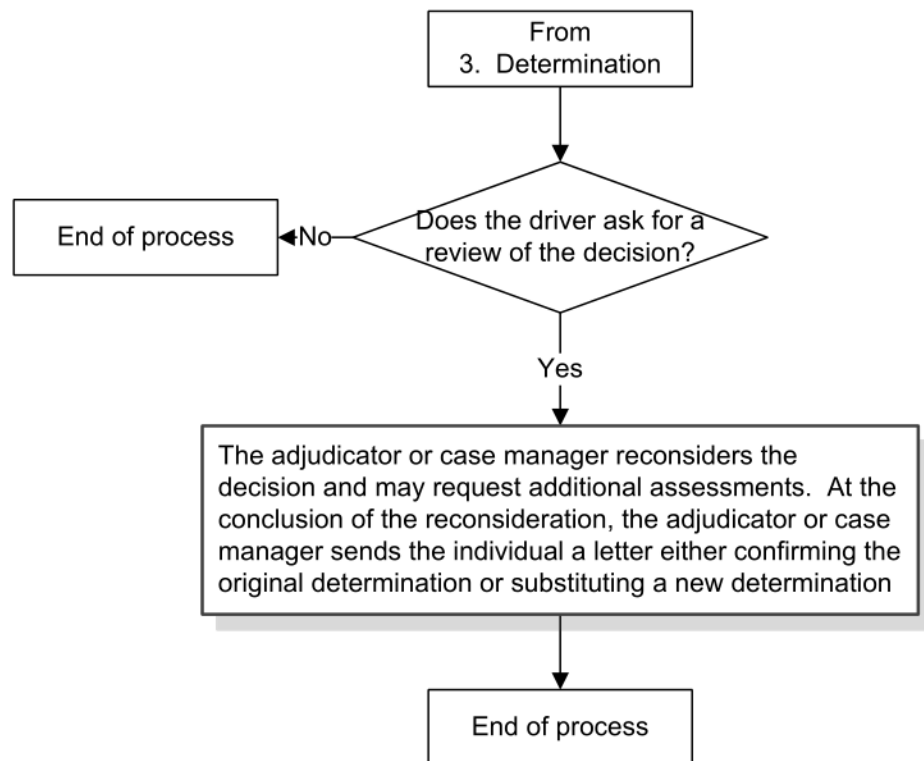
DETERMINATION PROCEDURES



Chapter 8: Reconsideration Policies and Procedures

8.1 Overview

If an individual asks the OSMV to review a driver fitness determination, an adjudicator or case manager will conduct a reconsideration of that decision. The following flowchart is an excerpt from the overview flowchart in 4.1 that highlights in red the steps involved in reconsideration.



During the reconsideration, the adjudicator or case manager may request additional assessments, in accordance with the policies outlined in Chapter 6 of this Manual.

Once the adjudicator or case manager collects any additional information that may be required, the adjudicator or case manager applies the policies outlined in Chapter 7 of this Manual and decides whether the original driver fitness determination was correct or whether a different determination is required.

In some circumstances, a request for review will trigger a new driver fitness determination, based on new assessment results, rather than a reconsideration of a previous determination. This will occur if an individual:

- submits new information indicating a change in their medical condition or functional ability to drive, or
- asks for a review of a determination that is based on assessments that are more than one year old.

8.2 Conducting reconsiderations

Policy

8.2.1 If an individual asks in writing for a review of a driver fitness determination, and provides detailed reasons for the request, an adjudicator or case manager will reconsider the determination.

8.2.2 If the assessments upon which the determination were based were performed more than one year prior to the date of the request for review, a case manager or adjudicator will generally make a new driver fitness determination, based on new assessments, rather than reconsidering the previous determination.

- 8.2.3 If an individual submits new information indicating a change in their medical condition, or in their functional ability to drive, a case manager or adjudicator will make a new driver fitness determination, based on new assessments, rather than reconsidering the previous determination.
- 8.2.4 At the conclusion of a reconsideration, the adjudicator or case manager will either confirm the original driver fitness determination or substitute a new determination.
- 8.2.5 The adjudicator or case manager will provide the individual with a letter that describes the reconsideration decision and the reasons for the decision.

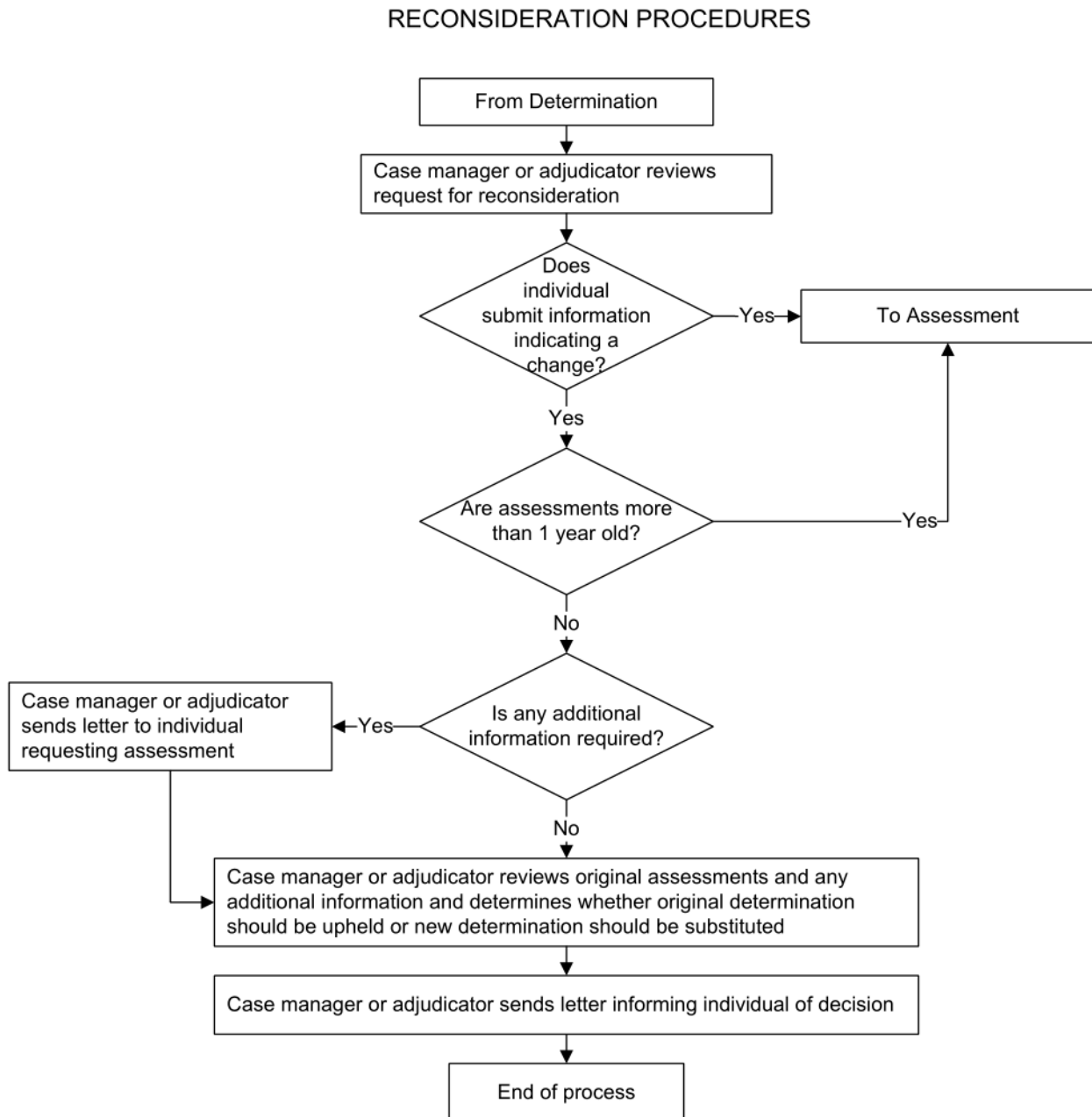
Policy rationale

In accordance with the principles of administrative fairness, the OSMV give individuals an opportunity to dispute the results of a driver fitness determination through its internal reconsideration process and provides written reasons with the results of the reconsideration.

In certain circumstances, a new driver fitness determination, rather than a reconsideration, is the more appropriate response to a request for review. Reconsiderations are an opportunity to review whether the correct determination was made given an individual's medical condition or functional ability at the time the determination was made. If an individual submits new information reflecting a change in the individual's medical condition or functional ability, a case manager or adjudicator will make a new driver fitness determination, based on this new information and any additional assessments that the case manager or adjudicator decides to request. Similarly, if an individual requests a review of a determination that is based upon assessments that are more than one year old, a case manager or adjudicator will make a new determination, rather than reconsidering the previous determination. This is because the previous assessments upon which the determination was based may no longer reflect the individual's current medical condition or functional ability.

8.3 Reconsideration procedures

The following flowchart graphically represents the procedures associated with the reconsideration process.



PART 3:

MEDICAL CONDITION CHAPTERS

Chapter 9: Introduction to the Medical Condition Chapters

9.1 Purpose of the medical condition chapters

The medical condition chapters in this part of the Manual:

- identify what conditions may have an impact on an individual's fitness to drive
- highlight the risk of impairment and crash associated with certain medical conditions
- identify appropriate screening and assessment tools to evaluate fitness to drive of an individual with a medical condition
- identify compensation strategies, devices and/or training that may be implemented to compensate for the effects of a medical condition on driving, and
- include guidelines to assist OSMV staff in determining whether an individual with a medical condition is fit to drive and appropriate reassessment intervals.

9.2 Source of the medical condition chapters

The medical condition chapters in this Manual are based primarily on the integrative review of Dr. Bonnie Dobbs and her report *Medical Conditions and Driving: A Review of the Scientific Literature 1960-2010*. In preparing that document, Dr. Dobbs used a multi-step process to critically evaluate and compile evidence from a number of sources, including research studies, consensus conference guidelines and expert opinion.

The best available evidence for a medical condition depends on how much research has been conducted on that condition and driving and the quality of the research. Unfortunately, the impact of some medical conditions on the functions necessary for driving has not been studied or has not been studied in depth. A lack of evidence does not mean that the condition has no impact. Rather, it simply means that the relevant research has not been conducted. In each medical condition chapter, the evidence associating the medical condition with an increased crash risk or an impairment of the functions necessary for driving is clearly stated.

In general, due to the variability in methodology and variability in outcome measures and statistical analyses, the evidence supporting a relationship between a medical condition and driving performance is based

on a convergence of evidence across studies. For some medical conditions there is substantial data from well-designed studies that indicate that the presence of that condition negatively impacts on driving performance. For other medical conditions, either the available literature is insufficient or methodological considerations are such that knowledge about the effect of the condition on driving performance is limited or unknown.

9.3 Source of the medical condition guidelines

The medical condition guidelines were drafted by the OSMV, with review and input from a variety of experts and stakeholders. Appendix 5 provides further details of the drafting and approval process. Wherever possible, the OSMV has incorporated current driver fitness research into the medical condition guidelines to ensure that they are based on the best evidence possible. Nonetheless, because of the paucity of evidence for many medical conditions, reliance on expert opinion is a necessary component of the medical condition guidelines.

9.4 Medical condition chapter template

Medical condition

BACKGROUND

About the medical condition

- This section includes basic information about the medical condition. Correct terminology is used.

Prevalence and incidence of the medical condition

- Prevalence is the global occurrence of the condition. Incidence is the number of new cases annually.
- This information is included to highlight why the condition is of concern.

The medical condition and adverse driving outcomes

- This section is where the evidence for regulating a particular condition is stated. The research that supports regulating the condition is broadly reviewed. The focus is on the pattern of findings.

Effect of the medical condition on functional ability to drive

- This section includes a table that identifies the functions that the medical condition primarily impairs and whether the impairment is persistent or episodic. The table also lists the assessment tools that the OSMV may request for an individual with the identified medical condition. An example is shown on the following page.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|-----------|---|--|--|
| X | Episodic impairment: Medical assessment – likelihood of impairment | Variable – sudden cognitive, motor or sensory impairment | Driver's Medical Examination Report Specialist's report |
| X | Persistent impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |

Compensation

- This section identifies whether or not a driver can compensate for the impairment caused by the medical condition

GUIDELINES

- This section outlines in table form the guidelines used by the OSMV to determine whether an individual with the identified medical condition is fit to drive.
- There may be multiple tables within a particular chapter. Each table indicates the medical condition(s) and licence class(es) to which the guidelines presented in that table apply. An example is shown on the following page.

Private and commercial drivers who have X

| | |
|--------------------------------------|--|
| Application | This section explains who the guidelines apply to. |
| Assessment guidelines | <p>This section outlines the assessments that the OSMV may request if further information is required. The assessments listed are those that are specific to an individual with the identified medical condition.</p> <p>Case managers and adjudicators should also refer to the general policies contained in part 2 of the manual when deciding the appropriate assessments to request, particularly where an individual has multiple medical conditions or impairments.</p> |
| Fitness guidelines | <p>This section outlines the general driver fitness guidelines, e.g.:</p> <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • |
| OSMV determination guidelines | <p>Because the general driver fitness guidelines are often written for a broad audience, including physicians, OT's and vision specialists, this section outlines the guidelines that the OSMV will use operationally to determine driver fitness. These guidelines are written as:</p> <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • |
| Conditions | This section outlines any conditions that the OSMV will impose, by letter, on an individual who is found fit to drive. |
| Restrictions | This section outlines any restrictions that the OSMV will impose on the licence of an individual who is found fit to drive. |
| Reassessment guidelines | This section outlines the OSMV's reassessment policy for individuals who are found fit to drive. |
| Policy rationale | This section explains the rationale for the policies outlined in the table. Where a general policy rationale applies to all of the guidelines within a chapter, the policy rationale will be included before the tables. |

Chapter 10: Medical Conditions at-a-Glance

For each major medical condition identified in the medical condition chapters, the following table identifies:

- whether the resulting impairment is persistent or episodic
- what functions(s) are impaired, and
- whether the condition also commonly results in a lack of stamina or general debility.

The following abbreviations are used in the table:

- “Cog” means cognitive
- “SI” means sudden incapacitation, and
- “GD” means general debility.

| Chapter and Condition | Impairment | | Function impaired | | | | | | Other | |
|---|-----------------|---------------|-------------------|-------------------|-----|---------|--------------|-------------|--------------|----|
| | Persis- tent | Epi- sodic | Motor | | Cog | Sensory | | All – SI | Sta- mina | GD |
| | | | | Sensori- motor | | Vision | Hear- ing | | | |
| 11. Diabetes – Hypoglycemia | | X | | | • | | | • | | |
| 12. Peripheral arterial disease - severe claudication | X | | • | • | | | | | | |
| 12. AAA | | X | | | | | | • | | |
| 12. Aortic dissection | | X | | | | | | • | | |
| 12. DVT – Pulmonary embolism | | X | | | | | | • | | |
| 13. Musculoskeletal | X | | • | | | | | | | |
| 14. Renal diseases | X | | | | • | | | | • | • |
| 15. Respiratory diseases | X | | | | • | | | | • | • |
| 16. Vestibular disorders | X | X | | • | • | | | • | | |
| 17. Cardiovascular diseases | X | X | | | • | | | • | | |
| 18. Hearing loss | X | | | | | | • | | | |
| 19. Psychiatric disorders | | X | | | • | | | | | |
| 20. Cerebrovascular diseases | | X | | | | | | • | | |
| 21. Vision impairment | X | | | | | • | | | | |
| 22. Syncope | | X | | | | | | • | | |
| 23. Seizures and epilepsy | | X | | | | | | • | | |
| 24. MS, Cerebral Palsy, Parkinson's | X | | • | | • | • | | | | |
| 25. Traumatic brain injuries | X | X | • | | • | • | • | • | | |
| 26. Intracranial tumours | X | X | • | | • | • | • | • | | |
| 27. Cognitive impairment including dementia | X | | | | • | | | | | |
| 28. Sleep apnea | X | X | | | • | | | • | | |
| 28. Narcolepsy | X | X | | | • | | | • | | |

Chapter 11: Diabetes - Hypoglycemia

BACKGROUND

11.1 About diabetes and hypoglycemia

Diabetes

Diabetes is a chronic and progressive disease characterized by hyperglycemia (high blood glucose). It appears in two principal forms³:

- type 1 diabetes, formerly called insulin-dependent diabetes mellitus (IDDM) or juvenile diabetes, and
- type 2 diabetes, formerly called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes.

Type 1 diabetes can occur at any age, but it primarily appears before age 30. Type 2 diabetes usually occurs in individuals over the age of 40. Type 1 and type 2 also differ in the underlying defect, and type of therapeutic control. Type 1 is characterized by the inability to produce insulin and often more marked fluctuations in blood glucose. Daily insulin injections are always required to manage type 1 diabetes. Type 2 diabetes is characterized by an impaired ability to recognize and utilize insulin, and eventually diminished insulin production. Therapeutic control often is achieved by diet alone or in combination with oral antihyperglycemic agents⁴, but people with type 2 diabetes whose blood glucose cannot be controlled in this way require treatment with insulin.

Hypoglycemia

Anyone who requires treatment with insulin is at risk of hypoglycemia. Those with type 2 diabetes treated with insulin secretagogues (oral medications that stimulate the secretion of insulin) or metformin (an oral medication that enhances the effect of insulin) also may experience hypoglycemia, although the frequency with this treatment is lower than with insulin. Hypoglycemia may occur for a number of reasons, including reduced food intake, unusual level of physical exertion, and alteration of insulin dose.

Hypoglycemia can result in two types of symptoms, neurogenic (autonomic) and neuroglycopenic.

³ Other types of diabetes include gestational diabetes, other specific types (those due to genetic defects in β -cell function, genetic defects in insulin action, diseases of the exocrine pancreas, drug or chemical induced diabetes, etc.), and pre-diabetes. These types of diabetes are less common than type 1 and type 2 diabetes and are not discussed in this chapter.

⁴ Oral antihyperglycemics also may be referred to as oral hypoglycemics.

Neurogenic symptoms of hypoglycemia

The body's immediate response to low blood sugar is to secrete hormones that counteract insulin, including adrenaline. The presence of adrenaline causes neurogenic (or autonomic) symptoms such as tremulousness, palpitations, anxiety, sweating, hunger, and paresthesias (tingling and numbness). People with diabetes learn to recognize these symptoms as evidence of hypoglycemia and respond by consuming sugary liquids or starchy foods to increase their blood glucose level.

Neuroglycopenic symptoms of hypoglycemia

Neuroglycopenic symptoms are the direct result of impaired brain function due to low glucose levels. These symptoms include confusion, weakness or fatigue, severe cognitive failure, seizure and coma. As the blood glucose level falls, higher cortical function (insight, judgment, calculation, speech and memory) is the first to be affected. Next, a person will experience stupor, characterized by confusion, slurred speech, slow reaction times, poor judgment and lack of coordination. If the level continues to fall, there will be loss of consciousness, seizures and potentially brain damage or death.

Hypoglycemia unawareness

Another complicating factor is hypoglycemia unawareness, which is the inability to recognize the autonomic symptoms of hypoglycemia or a failure of such warning signs to occur prior to impaired brain function. If the initial autonomic symptoms caused by the release of adrenaline are missed, a person experiencing hypoglycemia can only rely on the neuroglycopenic symptoms as an indicator of low blood glucose. Because these symptoms appear in the context of cognitive impairment, they are not easily recognized by the hypoglycemic individual and may delay or prevent self-treatment.

Severe hypoglycemia

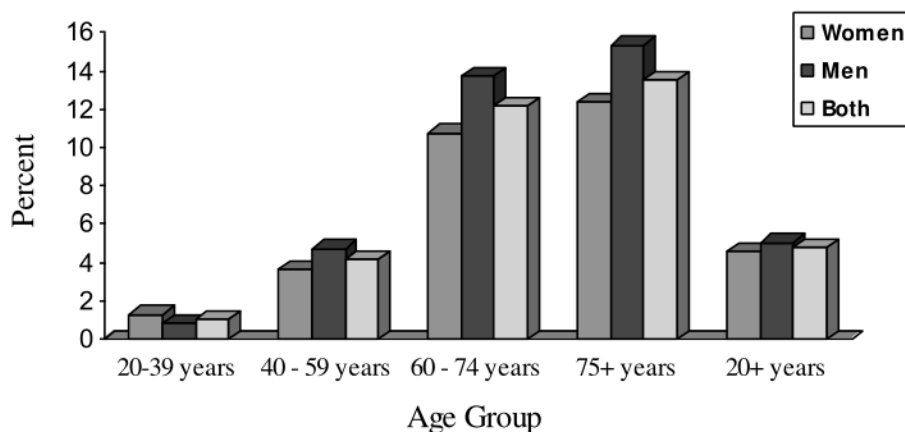
Severe hypoglycemia is commonly defined as hypoglycemia that requires outside intervention to abort, or that produces an alteration in level of consciousness or loss of consciousness. The altered or reduced level of consciousness prevents a person experiencing severe hypoglycemia from taking appropriate action.

11.2 Prevalence and incidence of diabetes and hypoglycemia

Diabetes

Based on research conducted by the National Diabetes Surveillance System, it is estimated that approximately 5% of Canadians aged 20 years and older have been diagnosed with diabetes. Diabetes is somewhat more prevalent in males, and the overall prevalence of diabetes increases with age as shown in Figure 1 below. It is estimated that 5 to 10% of diagnosed diabetes is type 1, and 90 to 95% is type 2.

Figure 1 - Prevalence of Diabetes in Canada



Hypoglycemia

A study of people with type 1 diabetes conducted in 1993 estimated that the incidence of mild hypoglycemia (hypoglycemia for which a person is able to treat themselves) to be 28 episodes per person per year. The incidence of severe hypoglycemia was estimated to be 0.31 episodes per person, per year. Since the mid 1990's there has been an increased therapeutic emphasis on tight glycemic control, which has been shown to significantly reduce the complications of diabetes. Unfortunately, the use of more intensive treatment to maintain glycemic control has increased the risk of hypoglycemia by as much as two or three times. This suggests that these estimates on the prevalence of hypoglycemia in type 1 diabetes may be low.

While people with type 2 diabetes who are treated with insulin are at risk of hypoglycemia, the frequency is lower than for those with type 1 diabetes. The incidence of severe hypoglycemia for type 2 diabetes treated with insulin secretagogues is about 1 to 2% per year, with higher risk for longer use, older age, and the use of chlorpropamide and other long-acting secretagogues. The concomitant use of beta blockers and insulin previously has been thought to increase the risk of hypoglycemia; however, this theoretical concern is not often seen in practice.

For anyone with diabetes, a history of severe hypoglycemia, hypoglycemia unawareness, and low blood glucose levels are consistent predictors of future hypoglycemia.

Hypoglycemia unawareness

It is estimated that 25% of all those treated with insulin will experience one or more episodes of hypoglycemia unawareness. In type 1 diabetes, hypoglycemia unawareness increases with the duration of diabetes and the likelihood increases if autonomic neuropathy is present. In type 2 diabetes, hypoglycemia unawareness is relatively uncommon.

Factors that may be associated with hypoglycemia unawareness include older age, duration of diabetes, presence of autonomic neuropathy, species of insulin, degree of metabolic control, and number of hypoglycemic events.

11.3 Diabetes and adverse driving outcomes

Although there is some variability in results of research on drivers with diabetes, there is clear evidence to show that both private and commercial drivers with diabetes are at an increased risk of motor vehicle crashes.

It has been shown that diabetes treatment modality is an important consideration in determination of risk for drivers. Study results consistently indicate that individuals taking insulin have an elevated risk of crashes. Some studies have also shown an elevated risk of crash for drivers with type 2 diabetes who are treated with a combination of oral antihyperglycemics (secretagogues and non-secretagogues). Those treated by diet alone or with a single oral antihyperglycemic agent have shown no elevated risk of crash.

A relationship between hypoglycemia and crashes has also been found. Despite a lack of data from studies of large samples of people with diabetes, a number of small studies have shown a relationship between hypoglycemic reactions and motor vehicle crashes.

While research has established clear links between diabetes, hypoglycemia and motor vehicle crashes, the variable results of these studies indicate that decisions about driving should be based on assessment of individual medical history and circumstances including:

- treatment modality
- incidence of hypoglycemia
- incidence of hypoglycemia unawareness, and
- presence of chronic complications of diabetes.

11.4 Effect of diabetes and hypoglycemia on functional ability to drive

For individuals with diabetes, both acute and chronic complications of the disease may affect fitness to drive.

Hyperglycemia may cause blurred vision, confusion, and eventually diabetic coma. For the purposes of this manual, these are considered transient impairments.

The neuroglycopenic symptoms associated with severe hypoglycemia can significantly impair the sensory, motor, and cognitive functions required for driving. There are studies that suggest that mild hypoglycemia may also impair these functions.

While it is clear that the risk of hypoglycemia is an important consideration when assessing the fitness of drivers with diabetes, research indicates that the chronic complications of diabetes are more likely to be responsible for impaired fitness to drive than episodic incidents of hypoglycemia. Over time, people with diabetes often develop co-morbidities caused by their prolonged exposure to hyperglycemia. These complications of diabetes include retinopathy,

neuropathy, nephropathy, cardiovascular disease, and peripheral vascular disease. Therefore, the effect of chronic complications always must be considered when assessing fitness to drive for people with diabetes.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
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| Severe hypoglycemia | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Doctor's Medical Report Re Diabetic Driver Driver's Diabetes Questionnaire |

11.5 Compensation

As severe hypoglycemia is an episodic impairment, a driver cannot compensate.

GUIDELINES

11.6 Private and commercial drivers with Type 2 diabetes that is not treated with insulin or insulin secretagogues

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| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers with Type 2 diabetes treated with diet and exercise alone or combined with:</p> <ul style="list-style-type: none"> • metformin (generic or under brand names Glucophage and Glumetza) • acarbose (brand name Prandase) • rosiglitazone (brand name Avandia), or • pioglitazone (brand name Actos). |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | <p>Individuals may drive if they:</p> <ul style="list-style-type: none"> • report to OSMV if they begin insulin therapy, and • remain under regular medical supervision to ensure that any progression in their condition or development of chronic complications does not go unattended. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV if you begin insulin therapy, and • you must remain under regular medical supervision to ensure that any progression in your condition or development of chronic complications does not go unattended. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>The OSMV will reassess every five years, or in accordance with the schedule for routine commercial or age-related reassessment.</p> <p>The OSMV will reassess if insulin or insulin secretagogue therapy is initiated.</p> |
| Policy rationale | <p>Drivers with diabetes who are not treated with insulin or insulin secretagogues are at little or no risk for hypoglycemia. Because diabetes is a progressive condition, the OSMV requires these drivers to remain under medical supervision and undergo a reassessment every five years.</p> <p>Drivers who begin insulin therapy are required to report because of the significant increase in risk for hypoglycemia associated with insulin therapy. The requirement to report is intended to ensure that</p> |

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| | <p>drivers on insulin therapy meet the more stringent driver fitness guidelines and conditions for driving.</p> <p>The requirement to report does not apply to insulin secretagogue therapy. Although there is some increased of hypoglycemia from the use of insulin secretagogues, the risk remains small in relation to the risk from insulin therapy.</p> |
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11.7 Private and commercial drivers with Type 2 diabetes that is treated with insulin secretagogues

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| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers with Type 2 diabetes treated with insulin secretagogues, including:</p> <ul style="list-style-type: none"> • glyburide (generic or under brand names DiaBeta and Euglucon) • gliclazide (generic or under brand names Diamicon and Diamicon MR) • glimpiride (brand name Amaryl) • repaglinide (brand name GlucoNorm), and • nateglinide (brand name Starlix). <p>If the individual has had an episode of severe hypoglycemia within the past six months, see the guidelines for private drivers under 11.10 and commercial drivers under 11.13.</p> |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. |
| Fitness guidelines | <p>Individuals may drive if they:</p> <ul style="list-style-type: none"> • have a good understanding of their condition • routinely follow their physician's instructions about diet, medication, glucose monitoring and the prevention of hypoglycemia • remain under regular medical supervision to ensure that any progression in their condition or development of chronic complications does not go unattended • stop driving and treat themselves immediately if hypoglycemia is identified or suspected • do not drive until a least 45 minutes after effective treatment if their blood glucose is between 2.5 and 4.0 mmol/L, and • report to OSMV if they begin insulin therapy |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if they:</p> <ul style="list-style-type: none"> • have a good understanding of their condition, and • routinely follow their physician's instructions about diet, medication, glucose monitoring and the prevention of hypoglycemia. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV if you begin insulin therapy • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia • you must remain under regular medical supervision to ensure that |

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| | <p>any progression in your condition or development of chronic complications does not go unattended</p> <ul style="list-style-type: none"> • you must stop driving and treat yourself immediately if hypoglycemia is identified or suspected, and • you must not drive until at least 45 minutes after effective treatment if your blood glucose is between 2.5 and 4.0 mmol/L. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>For Commercial Drivers, the OSMV will reassess annually.</p> <p>For Private Drivers, if blood glucose levels and treatment are not stable, the OSMV will reassess annually until levels and treatment are stable. If blood glucose levels and treatment are stable, the OSMV will reassess every five years or in accordance with the schedule for age related reassessment.</p> <p>The OSMV will reassess if insulin or insulin secretagogue therapy is initiated.</p> |
| Policy rationale | <p>Drivers with diabetes who are treated with insulin secretagogues have some risk for hypoglycemia, but this risk is still considerably lower than that associated with insulin therapy. To mitigate this risk, the OSMV requires that these drivers understand the risk and follow their physician's advice for monitoring their blood glucose and maintaining stability.</p> <p>As there is some risk for hypoglycemia, this poses additional conditions regarding how to avoid severe hypoglycemia while driving. These conditions are based on guidelines published by the Canadian Diabetes Association.</p> <p>The rationale for the requirement to report to OSMV if they experience severe hypoglycemia or if they begin insulin therapy is to ensure that drivers who are at increased risk meet the more stringent driver fitness guidelines and conditions for driving associated with severe hypoglycemia or insulin therapy. There is no requirement to report hypoglycemia unawareness because it is highly unlikely to occur to a driver who is not treated with insulin.</p> |

11.8 Private drivers with diabetes treated with insulin

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers with Type 1 or Type 2 diabetes that is treated with insulin.</p> <p>If the individual:</p> <ul style="list-style-type: none"> • has had an episode of severe hypoglycemia within the past six months, see the guidelines under 11.10 • has had an episode of hypoglycemia unawareness within the past year, see the guidelines under 11.11, or • has persistent hypoglycemia unawareness, see the guidelines under 11.12. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. |
| Fitness guidelines | <p>Individuals may drive if they:</p> <ul style="list-style-type: none"> • remain under regular medical supervision to ensure that any progression in their condition or development of chronic complications does not go unattended • understand their diabetic condition and the close interrelationship between insulin and diet and exercise • routinely follow their physician's advice regarding prevention and management of hypoglycemia • when on long drives, test their blood glucose concentration immediately before driving and approximately every 4 hours while driving, and have a source of readily available, rapidly absorbable glucose • do not drive when their glucose level is below 4.0 mmol/L • do not begin to drive when their glucose level is between 4.0 and 5.0 mmol/L unless they first take prophylactic carbohydrate treatment • stop driving and treat themselves immediately if hypoglycemia is identified or suspected, and • do not drive until a least 45 minutes after effective treatment if their glucose is between 2.5 and 4.0 mmol/L. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if they:</p> <ul style="list-style-type: none"> • understand their diabetic condition and the close interrelationship between insulin and diet and exercise, and • routinely follow their physician's advice regarding prevention and management of hypoglycemia. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must remain under regular medical supervision to ensure that |

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| | <p>any progression in your condition or development of chronic complications does not go unattended</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia or hypoglycemia unawareness • when on long drives, you must test your blood glucose concentration immediately before driving and approximately every 4 hours while driving, and have a source of readily available, rapidly absorbable glucose • you must not drive when your glucose level is below 4.0 mmol/L • you must not begin to drive when your glucose level is between 4.0 and 5.0 mmol/L unless you first take prophylactic carbohydrate treatment • you must stop driving and treat yourself immediately if hypoglycemia is identified or suspected, and • you must not drive until at least 45 minutes after effective treatment if your blood glucose is between 2.5 and 4.0 mmol/L. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If blood glucose levels and treatment are not stable, the OSMV will reassess annually until levels and treatment are stable. If blood glucose levels and treatment are stable, the OSMV will reassess every five years, or in accordance with the schedule for age-related reassessment. |
| Policy rationale | <p>Drivers with diabetes who are treated with insulin therapy are at risk for hypoglycemia. In addition to the conditions regarding how to avoid severe hypoglycemia while driving that apply to drivers treated with insulin secretagogues, there are additional conditions for checking and monitoring blood glucose. These conditions are based on guidelines published by the Canadian Diabetes Association.</p> <p>The rationale for the requirement to report to OSMV if they experience severe hypoglycemia or hypoglycemia unawareness is to ensure that drivers who are at increased risk meet the more stringent driver fitness guidelines and conditions for driving associated with severe hypoglycemia or hypoglycemia unawareness.</p> |

11.9 Commercial drivers with diabetes treated with insulin

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers with Type 1 or Type 2 diabetes that is treated with insulin.</p> <p>If the individual:</p> <ul style="list-style-type: none"> • has had an episode of severe hypoglycemia within the past six months, see the guidelines under 11.13 • has had an episode of hypoglycemia unawareness within the past year, see the guidelines under 11.14, or • has persistent hypoglycemia unawareness, see the guidelines under 11.15. |
| Assessment guidelines | <p>The OSMV will request:</p> <ul style="list-style-type: none"> • a Doctor's Report on Commercial Driver with Diabetes on Insulin completed by the treating physician (see a sample form in 11.16). To complete this form, the individual must have the results of an HbA_{1c} test taken within the previous 3 months. • a Driver's Report – Commercial Driver with Diabetes on Insulin completed by the applicant (see a sample form in 1.17), and • an Examination of Visual Function form completed by an optometrist or ophthalmologist, or the results of a vision examination including testing of visual fields completed within the previous year. <p>The individual must have available for the treating physician:</p> <ul style="list-style-type: none"> • records of medical care for the previous 24 months for initial assessment and 12 months for reassessment, and • a log of blood glucose measurements performed at least twice daily for the previous six months or since diagnosis if diagnosed less than six months previous. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they obtain and retain an initial certificate of competency in blood glucose measurement from an approved diabetic clinic • they carry the following supplies whenever they are driving: <ul style="list-style-type: none"> ○ blood glucose self-monitoring equipment, and ○ a source of readily available, rapidly absorbable glucose • they test their blood glucose concentration 1 hour or less before driving and approximately every 4 hours while driving • they do not begin or continue to drive if their glucose level falls below 6 mmol/L (108 mg/dL) and do not resume driving until their glucose level has risen to 6.0 mmol/L or higher following food ingestion, and • their work schedule has been approved by their treating physician |

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| | <p>as compatible with their insulin regimen.</p> <p>Individuals may not drive if:</p> <ul style="list-style-type: none"> • blood tests indicate uncontrolled diabetes; i.e.: <ul style="list-style-type: none"> ○ HbA_{1C} > 12%, or ○ > 10% of BG levels <4.0 mmol/L. • there has been a significant change in insulin therapy (i.e. introduction of insulin, or a change in type of insulin or number of injections) until monitoring and assessment indicates a stable and effective blood glucose control, and • there is evidence of inadequate self-monitoring of blood glucose (unreliable or no home blood glucose measurement) or inadequate knowledge of the causes, symptoms and treatment of hypoglycemic reactions. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they obtain and retain an initial certificate of competency in blood glucose measurement from an approved diabetic clinic • their work schedule has been approved by their treating physician as compatible with their insulin regimen • blood tests do not indicate uncontrolled diabetes. Indicators of uncontrolled diabetes are: <ul style="list-style-type: none"> ○ HbA_{1C} > 12%, or ○ > 10% of BG levels <4.0 mmol/L. • there has been no significant change in insulin therapy (i.e. introduction of insulin, or a change in type of insulin or number of injections) or, if there has been a significant change in insulin therapy, monitoring and assessment indicate a stable and effective blood glucose control, and • there is no evidence of inadequate self-monitoring of blood glucose (unreliable or no home blood glucose measurement) or inadequate knowledge of the causes, symptoms and treatment of hypoglycemic reactions. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must carry the following supplies whenever you are driving: <ul style="list-style-type: none"> ○ blood glucose self-monitoring equipment, and ○ a source of readily available, rapidly absorbable glucose • you must test your blood glucose concentration 1 hour or less before driving and approximately every 4 hours while driving, and • you must not begin or continue to drive if your glucose level falls below 6 mmol/L (108 mg/dL) and you must not resume driving until your glucose level has risen to 6.0 mmol/L or higher following food ingestion. |

11.10 Private drivers who have an episode of severe hypoglycemia

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| Application | These guidelines apply to driver fitness determinations for private drivers who have had an episode of severe hypoglycemia within the previous 6 months. If the episode was caused by hypoglycemia unawareness, see the guidelines under 11.11. |
| Assessment guidelines | Driver fitness determinations will be made by case managers. If further information is required, the OSMV will request additional information from the treating physician. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • their treating physician has indicated to OSMV that they have re-established stable glycemic control and OSMV has determined that they are fit to resume driving. The period of time required to re-establish glycemic control will vary on a case-by-case basis. • upon return to driving, they test their blood glucose immediately before driving and approximately every hour while driving, and • they do not begin or continue to drive if their blood glucose level falls below 6.0 mmol/L and they do not resume driving until their blood glucose level has risen above 6.0 mmol/L after food ingestion <p>If after six months there are no further episodes, they may continue to drive if they follow the regular guidelines for drivers with diabetes.</p> |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if their treating physician indicates that they have re-established stable glycemic control. The period of time required to re-establish glycemic control will vary on a case-by-case basis. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia • for the next six months, you must test your blood glucose concentration immediately before driving and approximately every hour while driving • for the next six months, you must not drive, or you must stop driving, when your blood glucose level falls below 6.0 mmol/L and you must not resume driving until your blood glucose level has risen above 6.0 mmol/L after food ingestion. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess as recommended by the treating physician. At that time, if the treating physician indicates that there have been no episodes of severe hypoglycemia within the past six months, the |

11.11 Private drivers who have an episode of hypoglycemia unawareness

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| Application | These guidelines apply to driver fitness determinations for private drivers who have had an episode of hypoglycemia unawareness within the previous year. If the hypoglycemia unawareness is persistent (i.e., the driver has not regained awareness), see the guidelines under 11.12. |
| Assessment guidelines | Driver fitness determinations will be made by case managers. If further information is required, the OSMV will request additional information from the treating physician. |
| Fitness guidelines | Individuals may not drive for a minimum of 3 months after the episode. After 3 months, individuals may drive if: <ul style="list-style-type: none"> • their treating physician has indicated to OSMV that they have regained glycemic awareness and have stable glycemic control, and • they follow the blood glucose monitoring guidelines for individuals with a history of severe hypoglycemia. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • it has been at least 3 months since the episode of hypoglycemia unawareness, and • their treating physician has indicated that they have regained glycemic awareness and have stable glycemic control. |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia or hypoglycemia unawareness • you must test your blood glucose concentration immediately before driving and approximately every hour while driving, and • you must not drive, or you must stop driving, when your blood glucose level falls below 6.0 mmol/L and you must not resume driving until your blood glucose level has risen above 6.0 mmol/L after food ingestion. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. At that time, if the treating physician indicates that there have been no further episodes of hypoglycemia unawareness within the past year, the conditions listed above will be removed and the applicable guidelines for private drivers with diabetes will apply. |
| Policy rationale | Hypoglycemia unawareness greatly increases the risk for hypoglycemia while driving. These guidelines require that glycemic awareness be reestablished before driving resumes. Once awareness |

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| | and glucose stability are reestablished, more stringent glucose monitoring guidelines are required temporarily to mitigate the increased risk of hypoglycemia. |
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11.12 Private drivers who have persistent hypoglycemia unawareness

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| Application | These guidelines apply to driver fitness determinations for private drivers who have persistent hypoglycemia unawareness. |
| Assessment guidelines | <p>Driver fitness determinations will be made by case managers.</p> <p>If further information is required, the OSMV will request additional information from the treating physician.</p> |
| Fitness guidelines | <p>If 3 months after an episode an individual has persistent hypoglycemia unawareness, they may drive if:</p> <ul style="list-style-type: none"> • their treating physician has indicated to OSMV that they have stable glycemic control and are willing and able to take steps to ensure they do not become hypoglycemic while driving • they retain a blood glucose log and review it with their treating physician at intervals the physician feels are necessary to monitor continued glycemic control, and • they follow the blood glucose monitoring guidelines for individuals with a history of severe hypoglycemia for as long as their hypoglycemia unawareness persists. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since the last episode of hypoglycemia unawareness, and • their treating physician indicates that they have stable glycemic control and are willing and able to take steps to ensure they do not become hypoglycemic while driving. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia or hypoglycemia unawareness • you must retain a blood glucose log and review it with their treating physician at intervals the physician feels are necessary to monitor continued glycemic control • you must test your blood glucose concentration immediately before driving and approximately every hour while driving, and • you must not drive, or you must stop driving, when your blood glucose level falls below 6.0 mmol/L and you must not resume driving until your blood glucose level has risen above 6.0 mmol/L after food ingestion. |
| Restrictions | No restrictions are required. |

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| <p>Reassessment guidelines</p> | <p>The OSMV will reassess annually.</p> <p>If the treating physician indicates on two consecutive annual reassessments that:</p> <ul style="list-style-type: none"> • awareness has been regained, and • there have been no episodes of hypoglycemia unawareness within the past year <p>the conditions listed above will be removed and the applicable guidelines for private drivers with diabetes will apply.</p> |
| <p>Policy rationale</p> | <p>Persistent hypoglycemia unawareness presents the greatest risk for hypoglycemia while driving. The guidelines permit private drivers to continue to drive provided they are able to maintain stable blood glucose and allows follow more stringent glucose monitoring requirements.</p> |

11.13 Commercial drivers who have an episode of severe hypoglycemia

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| Application | These guidelines apply to driver fitness determinations for commercial drivers who have had an episode of severe hypoglycemia within the previous 6 months. If the episode was caused by hypoglycemia unawareness, see the guidelines under 11.14. |
| Assessment guidelines | <p>Driver fitness determinations will be made by case managers.</p> <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Doctor's Report on Commercial Driver with Diabetes on Insulin completed by the treating physician. To complete this form, the individual must have the results of an HbA1C test taken within the previous 3 months, and • a Driver's Report – Commercial Driver with Diabetes on Insulin completed by the applicant. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have provided their treating physician with a blood glucose log of at least 4 readings per day for 30 days, in which less than 5% of the readings are below 4.0 mmol/L • their treating physician has indicated to OSMV that they have re-established stable glycemic control and OSMV has determined that they are fit to resume driving. The period of time required to re-establish glycemic control will vary on a case-by-case basis, and • upon return to driving, they test their blood glucose immediately before driving and approximately every hour while driving, and do not drive if their blood glucose level is below 6.0 mmol/L <p>If after six months there are no further episodes, they may continue to drive if they follow the regular guidelines for drivers with diabetes.</p> |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have provided their treating physician with a blood glucose log of at least 4 readings per day for 30 days, in which less than 5% of the readings are below 4.0 mmol/L, and • their treating physician has indicated to OSMV that they have re-established stable glycemic control. The period of time required to re-establish glycemic control will vary on a case-by-case basis. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia • for the next six months, you must test your blood glucose concentration immediately before driving and approximately every hour while driving, and |

| | |
|--------------------------------|--|
| | <ul style="list-style-type: none"> for the next six months you must not drive, or you must stop driving, when your blood glucose level falls below 6.0 mmol/L and you must not resume driving until your blood glucose level has risen above 6.0 mmol/L after food ingestion. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |
| Policy rationale | Severe hypoglycemia indicates a lack of glycemic control and the potential for further hypoglycemic episodes. Once control is re-established and driving resumes, more stringent glucose monitoring guidelines are required temporarily to mitigate the increased risk of hypoglycemia. |

11.14 Commercial drivers who have an episode of hypoglycemia unawareness

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have had an episode of hypoglycemia unawareness within the previous year. If the hypoglycemia unawareness is persistent (i.e., the driver has not regained awareness), see the guidelines under 11.15. |
| Assessment guidelines | <p>Driver fitness determinations will be made by case managers.</p> <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Doctor's Report on Commercial Driver with Diabetes on Insulin completed by the treating physician. To complete this form, the individual must have the results of an HbA1C test taken within the previous 3 months, and • a Driver's Report – Commercial Driver with Diabetes on Insulin completed by the applicant. |
| Fitness guidelines | <p>Individuals who have experienced an episode of hypoglycemia unawareness may not drive for a minimum of 3 months after the episode. After 3 months, they may drive if:</p> <ul style="list-style-type: none"> • they have provided their treating physician with a blood glucose log of at least 4 readings per day for 30 days, in which less than 5% of the readings are below 4.0 mmol/L • their treating physician has indicated to OSMV that they have regained glycemic awareness and have stable glycemic control, and OSMV has determined that they are fit to resume driving, and • they follow the blood glucose monitoring guidelines for individuals with a history of severe hypoglycemia. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since the episode of hypoglycemia unawareness • they have provided their treating physician with a blood glucose log of at least 4 readings per day for 30 days, in which less than 5% of the readings are below 4.0 mmol/L, and • their treating physician has indicated that they have regained glycemic awareness and have stable glycemic control. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have an episode of severe hypoglycemia or hypoglycemia unawareness • you must test your blood glucose concentration immediately before driving and approximately every hour while driving, and • you must not drive, or you must stop driving, when your blood glucose level falls below 6.0 mmol/L and you must not resume |

| | |
|--------------------------------|---|
| | driving until your blood glucose level has risen above 6.0 mmol/L after food ingestion. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. At that time, if the treating physician indicates that there have been no episodes of hypoglycemia unawareness within the past year, the conditions listed above will be removed and the applicable guidelines for commercial drivers with diabetes will apply. |
| Policy rationale | Hypoglycemia unawareness greatly increases the risk for hypoglycemia while driving. These guidelines require that glycemic awareness be reestablished before driving resumes. Once awareness glucose is stability is reestablished, more stringent glucose monitoring guidelines are required temporarily to mitigate the increased risk of hypoglycemia. |

11.15 Commercial drivers who have persistent hypoglycemia unawareness

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have persistent hypoglycemia unawareness. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive. |
| OSMV determination guidelines | Individuals are not fit to drive. |
| Conditions | N/A |
| Restrictions | N/A |
| Reassessment guidelines | N/A |
| Policy rationale | Persistent hypoglycemia unawareness presents the greatest risk for hypoglycemia while driving. Given the increased driving exposure associated with commercial driving, individuals who have persistent hypoglycemia unawareness are not fit to drive. |

11.16 Doctor's report on commercial driver with diabetes on insulin



Office of the Superintendent
of Motor Vehicles
www.pssg.gov.bc.ca/osmv

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VICTORIA BC V8W 9J2
Phone: (250) 387-7747
Fax: (250) 952-6888

DOCTOR'S REPORT ON COMMERCIAL DRIVER WITH DIABETES ON INSULIN

NOTE TO THE DOCTOR: on a separate form, the driver has certified that they will:

- maintain a glycemic log **which shows the previous 6 months** and records the hours driven and blood glucose checks during that time
- produce their glycemic log for their doctor's review when they attend for completion of this form
- make available records of medical care for the previous 24 months for initial diabetes assessment, and 12 months for reassessment

PERSONAL HEALTH NUMBER

(MUST BE COMPLETED)

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

MSP Fee Code 96222

The personal information on this form is collected under the authority of the *Motor Vehicle Act*, *Medicare Protection Act*, and the *Freedom of Information and Protection of Privacy Act*. The information provided will be used to determine your fitness to drive a motor vehicle and allow the physician to bill through the British Columbia Medical Services Plan for the service. Personal information is protected from unauthorized use and disclosure in accordance with the *Freedom of Information and Protection of Privacy Act* and may be disclosed only as provided by that Act. If you have any questions about the collection, use and disclosure of the information collected, contact the Office of the Superintendent of Motor Vehicles at (250) 387-7747.

| PART A- GENERAL | |
|---|---|
| 1. Patient's name | 7. Has there been a significant change in insulin therapy, i.e. introduction of insulin, or a change in type of insulin or number of injections? <input type="checkbox"/> YES <input type="checkbox"/> NO |
| 2. Age when diagnosed | Commercial drivers must present a log of blood glucose measurements performed at least twice daily for the previous six months, or since diagnoses if diagnosed in the last 6 months, to their examining physician. |
| 3. How long have you treated this patient for diabetes? | 8a. Does the log indicate adequate self-monitoring of blood glucose? <input type="checkbox"/> YES <input type="checkbox"/> NO |
| 4. Result of one HbA1c completed within the last three months. Value: | 8b. Does the data in this patient's log indicate stable and effective blood glucose control? <input type="checkbox"/> YES <input type="checkbox"/> NO |
| 5. Does patient have a full understanding of the diabetic condition and the relationship between insulin dose, diet and exercise? <input type="checkbox"/> YES <input type="checkbox"/> NO | 9. Does patient take appropriate action based on blood glucose results? <input type="checkbox"/> YES <input type="checkbox"/> NO |
| 6. Has impairment by alcohol ever interfered with patient's ability to maintain good control of their diabetes? <input type="checkbox"/> YES <input type="checkbox"/> NO | 10. Is this patient's work schedule compatible with their treatment regime? <input type="checkbox"/> YES <input type="checkbox"/> NO |

| PART B – HYPOGLYCEMIA | |
|---|--|
| <p>11a. Has the patient had any hypoglycemic reactions during the past six months of which you are aware?</p> <p><input type="checkbox"/> NO <input type="checkbox"/> YES</p> <p>11b. If “yes”, indicate the date(s) and type(s) of treatment (i.e. self treated, treated by another person or by a medical professional)</p> | <p>12a. Does patient have hypoglycemia unawareness?</p> <p><input type="checkbox"/> NO <input type="checkbox"/> YES</p> <p>12b. If “yes” describe fully</p> <p>13. Does the glycemic log indicate that $\geq 10\%$ of BG levels <4.0 mmol/L. <input type="checkbox"/> NO <input type="checkbox"/> YES</p> |
| PART C – OTHER RELEVANT COMMENTS OR CONCERNS | |
| | |
| PHYSICIAN’S SIGNATURE | EXAMINING PHYSICIAN’S NAME AND ADDRESS (print name or use rubber stamp) |
| EXAMINATION DATE (YYYY/MM/DD) | |

11.17 Driver's report – commercial driver with diabetes on insulin



Office of the Superintendent
of Motor Vehicles
www.pssg.gov.bc.ca/osmv

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VICTORIA BC V8W 9J2
Phone: (250) 387-7747
Fax: (250) 952-6888

The personal information on this form is collected under the authority of the *Motor Vehicle Act* (RSBC 1996, c 318, s. 29) and the *Freedom of Information and Protection of Privacy Act* (RSBC 1996, c 165, s26(b) & s. 27(1)(c)). The information provided will be used to determine your fitness to drive a motor vehicle. If you have any questions about the collection, use and disclosure of the information collected, contact the Office of the Superintendent of Motor Vehicles at (250) 387-7747.

DRIVER'S REPORT – COMMERCIAL DRIVER WITH DIABETES ON INSULIN

Driver's Name _____ DL # _____ Date Issued _____

1. Can you recognize a hypoglycemic reaction when it occurs? ☐ YES ☐ NO
2. Please list the symptoms you would experience during a hypoglycemic reaction:

3. How would you treat a hypoglycemic reaction?

4. Do you carry food and glucose (sugar) on your person? ☐ YES ☐ NO
5. In the last year have you had a hypoglycemic reaction where you lost consciousness or where you required assistance of another person to treat the hypoglycemia? ☐ YES ☐ NO
If yes describe: _____
6. In the last year have you had an episode of hypoglycemic unawareness? ☐ YES ☐ NO
If yes describe: _____

DRIVER'S CERTIFICATION:

I agree that while I hold a British Columbia class 1, 2, 3, or 4 driver's licence, I will:

- Carry blood glucose monitoring equipment and a source of readily available, rapidly absorbable glucose
- Check my blood glucose within 1 hour or less before driving and approximately every 4 hours while driving
- Not drive when my blood glucose is less than 6 mmol/L, and I will not resume driving until my blood glucose levels have risen to 6.0mmol/L or higher following food ingestion
- Make available to my doctor records of medical care for the previous 24 months for initial assessment and 12 months for reassessment, and
- Maintain a log of blood glucose measurements performed at least twice daily for the previous six months or since diagnosis if diagnosed less than six months previous, and
- Record the hours driven and blood glucose checks during that time in the glycemic log, and

- Produce my glycemic log for my doctor to review when I attend for completion of the diabetic package forms provided to me by the OSMV.
- Obtain and retain an initial certificate of competency in blood glucose measurement from an approved diabetic teaching clinic

I acknowledge that failure to produce my certificate of competence and glycemic log to my doctor on request may result in cancellation of my driver's licence.

- 1) **I CERTIFY THAT THE STATEMENTS IN THIS REPORT ARE TRUE AND COMPLETE** AND THAT THE INFORMATION THAT I HAVE GIVEN TO THE PHYSICIAN TO COMPLETE THE DOCTOR'S REPORT ON COMMERCIAL DRIVER WITH DIABETES ON INSULIN REPORT IS TRUE AND COMPLETE.
- 2) I UNDERSTAND THAT INACCURATE, MISLEADING, MISSING OR FALSE INFORMATION MAY LEAD TO DENIAL OR CANCELATION OF MY DRIVER'S LICENCE.
- 3) I AUTHORIZE THE RELEASE OF ALL REPORTS FROM MEDICAL SPECIALIST(S) PERTAINING TO DISEASE, DISABILITIES AND CONDITIONS THAT MAY AFFECT DRIVING TO THE (OFFICE OF SUPERINTENDENT OF THE MOTOR VEHICLES

| | |
|------------|----------------|
| SIGNATURE: | TELEPHONE NO.: |
| ADDRESS: | DATE: |

Chapter 12: Peripheral Vascular Diseases

BACKGROUND

12.1 About peripheral vascular diseases

The term peripheral vascular diseases (PVDs) refers to circulatory disorders involving any of the blood vessels outside the heart, e.g. arteries, veins, and lymphatics of the peripheral vasculature. The four subcategories of PVDs that have the greatest relevance for driving are:

- peripheral arterial disease
- aneurysms
- dissections, and
- deep vein thrombosis.

Peripheral arterial disease

Peripheral arterial disease (PAD) is characterized by partial or complete failure of the arterial system to deliver oxygenated blood to peripheral tissue. Atherosclerosis is the primary underlying cause of PAD. Other causes include thromboembolic, inflammatory, or aneurismal disease. Although PAD can affect both upper and lower extremities, lower extremity involvement is more common. A large majority (70% to 80%) of individuals with PAD are asymptomatic. For those individuals who are symptomatic, symptoms can progress from intermittent claudication (pain while walking) to rest/nocturnal pain, to necrosis/gangrene. Only 1% to 2%, however, progress to limb amputation within 5 years of the original diagnosis.

Aneurysms

An aneurysm is defined as a localized abnormal dilation of an artery by 50% above the normal size. Although an aneurysm can form on any blood vessel, abdominal aortic aneurysms (AAA) are most common, with 90% occurring below the renal arteries. Others include those occurring in the thoracic aorta (ascending 5%; aortic arch 5%; descending 13%), those in the combined thoracic and abdominal aorta (14%), and iliac aneurysms (isolated 1%; combined abdominal and iliac 13%).

Aortic dissection

Aortic dissection is a different disease to aortic aneurysm. Most dissections are in apparently normal aortas, are sudden and often present with collapse. Apart from some congenital conditions which predispose to dissections e.g. Marfan's, there is no way to predict an aortic dissection.

Deep vein thrombosis

Deep vein thrombosis (DVT) occurs when a thrombus (blood clot) forms within a deep vein, most commonly in the calf. Three main factors (known as Virchow's triad) can contribute to deep vein thrombosis: injury to the vein's lining, an increased tendency for blood to clot, and slowing of blood flow.

12.2 Prevalence and incidence of peripheral vascular diseases

Peripheral arterial disease

Estimates of the prevalence of PAD depend on populations studied and study methodology. The general prevalence rate is reported to be 10%. However, because most individuals remain asymptomatic, the true overall prevalence rate is likely to be considerably higher. The prevalence of PAD increases with age and with prolonged exposure to smoking, hypertension, and diabetes.

Recent studies indicate that PAD affects approximately 20% of adults 55 years of age and older and an estimated 27 million persons in North America and Europe. Intermittent claudication is the most common symptom associated with PAD. The prevalence of intermittent claudication increases dramatically with age. The incidence in the general population is less than 1% those under the age of 55, and increases to 5% for those 55 to 74 years of age. At younger ages, the prevalence rate is almost twice as high for males as for females, but at the older ages, the difference between males and females is reduced. Risk factors for PAD are shown in Table 1.

Table 1

Individuals at-risk for Lower Extremity Peripheral Arterial Disease⁵

Age less than 50 years, with diabetes and one other atherosclerosis risk factor (smoking, dyslipidemia, hypertension, or hyperhomocysteinemia)
Age 50 to 69 years and history of smoking or diabetes
Age 70 years and older
Leg symptoms with exertion (suggestive of claudication) or ischemic rest pain
Abnormal lower extremity pulse examination
Known atherosclerotic coronary, carotid, or renal artery disease

Abdominal aortic aneurysms

Based on results from a population-based study completed in 2001, the prevalence of abdominal aortic aneurysms is approximately 9% for males and 2.2% for females. Prevalence increases

⁵ Reproduced, with permission from Hirsch, Haskal, Hertz et al.. ACC/AHA guidelines Guidelines for the Management of Patients With Peripheral Arterial Disease (Lower Extremity, Renal, Mesenteric, and Abdominal Aortic): Executive Summary. *Journal of the American College of Cardiology*. Available at: <http://www.acc.org/clinical/guidelines/pad/summary.pdf>

with age and is higher in close family relatives of those affected. Prevalence also is higher in individuals with cardiovascular risk factors such as cigarette smoking, hypertension, and hypercholesterolemia.

Deep vein thrombosis

The prevalence of DVT is estimated to be $< 0.005\%$ in individuals less than 15 years of age, and increases to approximately 0.5% for individuals 80 years of age and older. Approximately one-third of patients with symptomatic DVT will develop a pulmonary embolism, which is the obstruction of the pulmonary artery or a branch of it leading to the lungs by a blood clot.

12.3 Peripheral vascular diseases and adverse driving outcomes

There are no studies that consider a relationship between peripheral vascular diseases and risk of crash.

12.4 Effect of peripheral vascular diseases on functional ability to drive

Peripheral arterial disease

For individuals with peripheral arterial disease, the chronic outcomes of the disease will rarely affect fitness to drive. The symptoms of lower extremity PAD such as coldness or numbness in the foot or toes, and in the later stages, pain while the extremity is at rest, may affect the sensory and motor functions required for driving.

In general, the degree of impact will be determined by disease severity. For example, individuals who are asymptomatic or have mild to moderate claudication are unlikely to have symptoms that would affect driving. Individuals whose disease has progressed to the severe claudication stage or higher may have functional impairment sufficient to interfere with the lower extremity demands of operating a motor vehicle (e.g., awareness of foot placement, pedal pressure, motor strength, etc.).

Abdominal aortic aneurysm and aortic dissection

For individuals with an abdominal aortic aneurysm, acute complications may affect fitness to drive. The primary concern with an abdominal aortic aneurysm is the risk of rupture. The majority of aneurysms are asymptomatic and research suggests that there are few or no symptoms prior to rupture. There is limited data on the immediate functional outcomes of rupture (e.g. loss of consciousness). In the absence of firm data, it is assumed that most individuals experiencing a rupture lose consciousness almost immediately. As with AAA, the primary concern for an individual with an aortic dissection is the risk of rupture.

Size and rate of expansion of abdominal aortic aneurysms and aortic dissections are determined by sequential CT or Ultrasound imaging. Only the anterior-posterior or transverse diameter is predictive of rupture; the length of the aneurysm has no relation to rupture.

Aneurysms less than 5 cm in diameter have an annual incidence of rupture of 4.1%, which increases to 6.6% in aneurysms between 5 and 5.7 cm. Aneurysms larger than 7 cm in diameter have 19 percent per year incidence of rupture. This means that most patients (75%) with this size of aneurysm will have a rupture within 5 years.

Surgical repair is considered where an aneurysm is greater than 5.5 cm. A recent study suggests that women's aneurysms rupture at smaller sizes, leading to the conclusion that the 5.5 cm threshold for surgical repair is likely too large for women and 5 cm has been suggested as the appropriate level.

Deep vein thrombosis

For individuals with deep vein thrombosis (DVT), acute complications may affect fitness to drive. The primary concern with DVT is the risk of sudden incapacitation due to a pulmonary embolism.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|---|---|-------------------------------------|--|
| Peripheral arterial disease – severe claudication | Persistent Impairment: Functional assessment | Sensorimotor Motor | Driver's Medical Examination Report Specialist's report ICBC Road test Functional assessment by an occupational therapist or driver rehabilitation specialist |
| Abdominal aortic aneurysm | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Specialist's report |
| Aortic dissection | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Specialist's report |
| DVT - may result in pulmonary embolism | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Specialist's report |

12.5 Compensation

Individuals are not able to compensate for the effects of an AAA, aortic dissection or DVT.

Individuals with an amputation resulting from PAD may be able to compensate for functional impairment through strategies and/or vehicle modifications.

Strategies

For loss of limb, an individual may compensate through the use of a prosthetic device when driving.

Vehicle modifications

Individuals with PAD may be able to compensate for a functional impairment by driving a vehicle that has been modified to address their impairment. Compensatory vehicle modifications can include modifications to driving controls (e.g. hand controlled throttle and brake).

An occupational therapist, driver rehabilitation specialist, driver examiner or other medical professional may recommend specific compensatory vehicle modifications based on an individual functional assessment.

GUIDELINES

12.6 Private and commercial drivers with peripheral arterial disease

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have peripheral arterial disease. If an individual has lost a limb due to peripheral arterial disease, also see the guidelines under 13.6. |
| Assessment guidelines | <p>If further information on an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If the treating physician indicates that the individual has:</p> <ul style="list-style-type: none"> • severe claudication, or • foot and leg symptoms that may impair their functional ability to drive <p>the OSMV will request an ICBC road test.</p> <p>If an ICBC driver examiner recommends further assessment, the OSMV may request:</p> <ul style="list-style-type: none"> • additional information regarding the individual's medical condition, and/or • an assessment from an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | Individuals may drive if the peripheral arterial disease is successfully treated. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their treating physician does not indicate severe claudication or foot and leg symptoms that may impair their functional ability to drive, or • where their treating physician does indicate severe claudication or foot and leg symptoms that may impair their functional ability to drive, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |

| | |
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| <p>Reassessment guidelines</p> | <p>For private drivers, the OSMV will reassess every 5 years if successfully treated or mild claudication. The OSMV may reassess more frequently, upon the recommendation of the treating physician, if moderate or severe claudication.</p> <p>For commercial drivers, routine commercial reassessment applies, unless more frequent reassessment is recommended by the treating physician.</p> |
| <p>Policy rationale</p> | <p>Where peripheral arterial diseases results in a functional impairment, the impact of the impairment on driving should be determined by an individual functional assessment.</p> |

12.7 Private drivers who have an aneurysm or dissection

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have either:</p> <ul style="list-style-type: none"> • an abdominal aortic aneurysm, or • a medically treated aortic dissection. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician, such as a report from within the past year indicating the diameter of the aneurysm or dissection. |
| Fitness guidelines | <p>An individual may not drive if their aortic aneurysm is at the stage of imminent rupture as determined by size, location or recent change.</p> <p>Men may drive if:</p> <ul style="list-style-type: none"> • the diameter of the aneurysm or dissection is < 6.5 cm, and • their condition is regularly reviewed. <p>Women may drive if:</p> <ul style="list-style-type: none"> • the diameter of the aneurysm or dissection is < 6 cm, and • their condition is regularly reviewed. |
| OSMV determination guidelines | <p>The OSMV may find men fit to drive if:</p> <ul style="list-style-type: none"> • the diameter of the aneurysm or dissection is < 6.5 cm, and • their condition is regularly reviewed. <p>The OSMV may find women fit to drive if:</p> <ul style="list-style-type: none"> • the diameter of the aneurysm or dissection is < 6 cm, and • their condition is regularly reviewed. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the diameter of the aneurysm or dissection is over 5 cm, the OSMV will reassess annually. If the diameter is between 4 and 5 cm, the OSMV will reassess every two years. If the diameter is under 4 cm, the OSMV will reassess every 5 years, unless routine age-related reassessment applies.</p> |
| Policy rationale | <p>The primary driver fitness concern with AAA and aortic dissection is the risk of rupture. The risk of rupture increases with the size of the aneurysm. The size threshold for driving fitness for private drivers has been set as just over the point at which surgery to repair the aneurysm or dissection is generally considered advisable given the risk of rupture.</p> |

12.8 Private and commercial drivers who have had surgery for an aneurysm or dissection

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have either:</p> <ul style="list-style-type: none"> • had surgery to repair an abdominal aortic aneurysm, or • had surgical treatment for an aortic dissection. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician <p>If any complications from the surgery are indicated, the driver fitness determination will be made by a case manager. In this situation, if further information is required, the OSMV may request a report from the vascular surgeon</p> |
| Fitness guidelines | <p>Individuals who have had surgery to repair an abdominal aortic aneurysm may drive.</p> <p>Individuals with a surgically treated dissection may drive with the support of the vascular surgeon.</p> |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the abdominal aortic aneurysm has been surgically repaired • the aortic dissection has been surgically treated, and the treating physician supports a return to driving |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will not reassess, other than routine commercial or age-related reassessment |
| Policy rationale | The primary driver fitness concern with AAA and aortic dissection is the risk of rupture. Successful surgery to repair an aneurysm or dissection will significantly reduce the risk of rupture. |

12.9 Commercial drivers who have an aneurysm or dissection

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have either:</p> <ul style="list-style-type: none"> • an abdominal aortic aneurysm, or • a medically treated aortic dissection. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician, such as a report from within the past year indicating the diameter of the aneurysm or dissection. |
| Fitness guidelines | <p>An individual may not drive if their aortic aneurysm is at the stage of imminent rupture as determined by size, location or recent change.</p> <p>Men may drive if:</p> <ul style="list-style-type: none"> • the aneurysm or dissection is < 6 cm, and • their condition is regularly reviewed. <p>Women may drive if:</p> <ul style="list-style-type: none"> • the aneurysm or dissection is < 5.5 cm, and • their condition is regularly reviewed. |
| OSMV determination guidelines | <p>The OSMV may find men fit to drive if:</p> <ul style="list-style-type: none"> • the aneurysm or dissection is < 6 cm, and • their condition is regularly reviewed. <p>The OSMV may find women fit to drive if:</p> <ul style="list-style-type: none"> • the aneurysm or dissection is < 5.5 cm, and • their condition is regularly reviewed. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the diameter of the aneurysm or dissection is over 4 cm, the OSMV will reassess annually. If the diameter is between 3 and 4 cm, the OSMV will reassess every two years. If the diameter is under 3 cm, the OSMV will reassess every 3 years.</p> |
| Policy rationale | <p>The primary driver fitness concern with AAA and aortic dissection is the risk of rupture. The risk of rupture increases with the size of the aneurysm. The size threshold for driving fitness for commercial has been set as the point at which surgery to repair the aneurysm or dissection is generally considered advisable given the risk of rupture. This threshold is lower than the threshold for private drivers to reflect the additional risk presented by the increased driving exposure for commercial drivers.</p> |

12.10 Private and commercial drivers who have deep vein thrombosis

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have deep vein thrombosis. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | <p>An individual may not drive if they have acute DVT that is untreated.</p> <p>An individual with DVT may drive if:</p> <ul style="list-style-type: none"> • they are being treated with an anticoagulant, and • the treating physician states that treatment is effective. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are being treated with an anticoagulant, and • the treating physician states that treatment is effective. <p>An individual may not drive if they have acute DVT that is untreated.</p> |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will not reassess, other than routine commercial or age-related reassessment |
| Policy rationale | The primary concern with DVT is the risk of sudden incapacitation due to a pulmonary embolism. Acute DVT that is untreated is a transient impairment. Once treated, the OSMV will find the individual fit to drive. |

Chapter 13: Musculoskeletal Conditions

BACKGROUND

13.1 About musculoskeletal conditions

This chapter is concerned with diseases or injuries that have a persistent impact on the musculoskeletal system. Musculoskeletal refers to the system of muscles, tendons, ligaments, bones, joints, cartilage and other connective tissues. The musculoskeletal system is responsible for body movement and stability. Examples of chronic musculoskeletal conditions that may have a persistent impact on driving are:

- diseases of the joints, e.g. rheumatoid arthritis and osteoarthritis
- disabilities of the spine, e.g. degenerative disc disease or permanent injuries
- deformity, e.g. scoliosis, and
- loss of limb.

Some musculoskeletal conditions, or procedures to treat the conditions, may result in temporary impairment of the functions necessary for driving, including fractures, temporary braces and casts, hip and knee replacements, and various orthopedic surgeries. These are considered transient impairments.

13.2 Prevalence and incidence of musculoskeletal conditions

Statistics on the prevalence and incidence of musculoskeletal conditions in general are difficult to obtain because of the broadness of the category and the diversity of conditions within the category. Research suggests that musculoskeletal conditions are a leading cause of pain and physical disability. In Canada, the Ontario Health Survey (1994) found that musculoskeletal conditions are responsible for 54% of all long-term disability, 40% of all chronic conditions, and 24% of all restricted activity days. A study in the United States found that the leading causes of disability included back or spine problems, stiffness or deformity of limbs and arthritis.

Arthritis is an umbrella term referring to a group of more than 100 medical conditions. Two of the most common forms of arthritis are osteoarthritis (OA) and rheumatoid arthritis (RA). It is estimated that 9.6% of males and 18.0% of females 60 years of age and older worldwide have symptomatic OA.

RA also has a worldwide distribution with an estimated prevalence of 1 to 2%. Both the incidence and prevalence of RA increase with age and both are two to three times greater in women than in men.

13.3 Musculoskeletal conditions and adverse driving outcomes

Few studies have specifically examined the relationship between musculoskeletal disabilities and impaired driving performance. As well, it is difficult to draw specific conclusions from this research because of differences in study design, outcome measures and the conditions studied, as well as limited measurement of the degree of impairment of the subjects.

Nonetheless, one broad conclusion that can be drawn is that many musculoskeletal conditions do appear to affect driving performance, often to a significant degree. In those studies that examined crash outcomes, the majority report elevated risk for crashes for those with musculoskeletal impairments. Two studies in particular (one a meta-analysis) identified that drivers with a musculoskeletal condition had crash rates that were 70% higher than those without musculoskeletal conditions.

Another important consideration for individuals with musculoskeletal conditions who are treated with non-steroidal anti-inflammatory drugs (NSAIDS) and/or narcotics is the effect of these drugs on driving performance. The effect of the use of NSAIDS and narcotics is discussed in Chapter 29, Psychotropic Drugs.

13.4 Effect of musculoskeletal conditions on functional ability to drive

Drivers operating motor vehicles of any class must be able to carry out many complex muscular movements swiftly, accurately and repeatedly in order to control a vehicle properly. Truck and bus drivers must also have good muscular strength and functional range of motion in both their arms and legs in order to handle these heavier vehicles.

Musculoskeletal conditions may cause a persistent impairment of motor functions necessary for driving. The specific impact on functional ability varies by condition and type of impairment. Functional abilities that may be affected include:

- muscular strength
- range of motion
- flexion and extension of upper and lower extremities
- joint mobility, and
- trunk and neck mobility.

Osteoarthritis has a considerable effect on functional ability, with the extent of the disability associated with the location and severity of the disease. For example, the risk for disability (defined as needing help walking or climbing stairs) attributable to OA of the knee is as great as that attributable to cardiovascular disease, and is greater than that due to any other medical condition in the aged population.

Functional disability is the major consequence of rheumatoid arthritis. Individuals with RA often experience a substantial loss of mobility due to pain and joint destruction. In the few studies that have examined the relationship between RA and driving performance 25% - 50% of individuals with RA reported difficulties with aspects of the driving tasks such as steering, cornering, reversing, head turns, and shoulder checks.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--|--|-------------------------------------|--|
| Loss of limb Diseases of the joints Disabilities of the spine Deformity | Persistent Impairment: Functional assessment | Motor | Driver's Medical Examination Report Specialist's report ICBC Road test Functional assessment by an occupational therapist or driver rehabilitation specialist |

13.5 Compensation

Individuals with musculoskeletal conditions may be able to compensate for functional impairment through strategies and/or vehicle modifications.

Strategies

For loss of limb, an individual may compensate through the use of a prosthetic device when driving. Other strategies that do not require vehicle modifications may include, for example, rotating the upper body in order to check side view mirrors if the driver's neck lacks sufficient mobility. The effectiveness of individual strategies may be determined through a road test.

Vehicle modifications

Individuals with musculoskeletal conditions may be able to compensate for a functional impairment by driving a vehicle that has been modified to address their impairment. Compensatory vehicle modifications can include modifications to driving controls (e.g. hand controlled throttle and brake) or the use of additional mirrors.

An occupational therapist, driver rehabilitation specialist, driver examiner or other medical professional may recommend specific compensatory vehicle modifications based on an individual functional assessment. They are familiar with the full range of possible vehicle modifications and what is appropriate for the type of musculoskeletal condition. Listed below are examples of some possible vehicle modifications.

| Musculoskeletal condition | Possible vehicle modifications |
|--|---|
| Some degree of loss of movement of the head and neck | Left and right outside mirrors Rear view cameras |
| Missing lower limb | Hand controls Left foot accelerator |
| Amputation or deformity of either arm | Power assisted steering Mechanical devices to permit all hand controls to be operated by the normal hand |

There is little empirical research that considers the relationship between vehicle modifications and adverse driving outcomes. The effectiveness of individual vehicle modifications may be determined through a road test.

GUIDELINES

13.6 Private and commercial drivers who have lost a limb

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have lost a limb of the upper or lower extremities. |
| Assessment guidelines | <p>The OSMV will request an ICBC road test, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> <p>If an ICBC driver examiner recommends further assessment, the OSMV may request:</p> <ul style="list-style-type: none"> • additional information regarding the individual's medical condition, and/or • an assessment from an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • a road test indicates that they are able to compensate for any loss of functional ability required for their class of licence held, and • their licence is restricted so that they are only permitted to drive vehicles that have the modifications and devices required to compensate for their functional impairment. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will restrict individuals' licences so that they are only allowed to drive vehicles that have the permitted modifications and devices required to compensate for their functional impairment. This may include one or more of the following restrictions:</p> <p>25 Fitted prosthesis/leg brace required</p> <p>26 Specified vehicle modifications required</p> <p>28 Restricted to automatic transmission</p> |
| Reassessment guidelines | If the loss of limb is not the result of a medical condition that is progressive, the OSMV will not reassess, other than routine commercial or age-related reassessment. If the loss of limb is the result of a medical condition that is progressive, the reassessment guidelines for that medical condition apply. |
| Policy rationale | The impact of a loss of limb on fitness to drive is variable and must be determined by an individual functional assessment. |

13.7 Private and commercial drivers who have a chronic musculoskeletal condition

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have a chronic musculoskeletal condition, including:</p> <ul style="list-style-type: none"> • diseases of the joints • disabilities of the spine, and • deformity. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If the treating physician indicates:</p> <ul style="list-style-type: none"> • loss of range of motion, and/or • weakness <p>the OSMV will request an ICBC road test, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> <p>If an ICBC driver examiner recommends further assessment, the OSMV may request:</p> <ul style="list-style-type: none"> • additional information regarding the individual's medical condition, and/or • an assessment from an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they retain sufficient movement and strength to perform the functions necessary for driving for their class of licence held • pain associated with the condition, or the drugs used to treat the condition, do not adversely affect their ability to drive safely • where required, a road test or other functional assessment indicates that they are able to compensate for any loss of functional ability required for driving, and • where permitted, they only drive with any vehicle modifications and devices required to compensate for their functional impairment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their treating physician does not indicate a loss of range of motion or weakness that may impair their functional ability to drive, or • where their treating physician does indicate a loss of range of motion or weakness that may impair their functional ability to drive, a functional assessment indicates that they have the |

Chapter 14: Chronic Renal Disease

BACKGROUND

14.1 About chronic renal disease

Chronic renal (kidney) disease is a progressive disease involving deterioration and destruction of renal nephrons, with a progressive and usually permanent loss of renal function. Diabetes, hypertension and glomerulonephritis are leading causes of chronic renal disease. It is divided into five stages of increasing severity, as shown in the table below. The stages are based on a measurement of kidney function called the glomerular filtration rate (GFR).

Stages of Chronic Renal Disease

| Stage | Description | GFR mL/min/1.73m ² |
|-------|--|----------------------------------|
| 1 | Slight kidney damage – normal or elevated GFR | More than 90 |
| 2 | Kidney damage – mild decrease in GFR | 60 to 89 |
| 3 | Kidney damage – moderate decrease in GFR | 30 to 59 |
| 4 | Kidney damage – severe decrease in GFR | 15 to 29 |
| 5 | Kidney failure – dialysis or transplant required | Less than 15 |

14.2 Prevalence and incidence of chronic renal disease

The prevalence of chronic renal disease in the adult population in the United States is estimated to be 11% and it is assumed that the prevalence in Canada would be approximately the same. It is more prevalent in the elderly population.

Stage 5 of chronic renal disease (kidney failure) is also referred to as end-stage renal disease, and is characterized by a total or near-total loss of kidney function where an individual requires dialysis or transplantation to stay alive. The prevalence rates for ESRD have increased substantially since 1997, most likely because of improved survival rates among high-risk populations, e.g. people with diabetes and hypertension, as well as improvements in management of ESRD, and the aging of the population.

14.3 Chronic renal disease and adverse driving outcomes

The evidence linking chronic renal disease with adverse driving outcomes is weak because there has been limited research in this area and the research that is available is either dated or has methodological limitations.

14.4 Effect of chronic renal disease on functional ability to drive

Cognitive impairment

Evidence suggests that cognitive impairment is associated with chronic renal disease and that with increasing disease severity there is also a corresponding decrease in cognitive functioning, which may impair functional ability to drive.

The highest risk of cognitive impairment is for those with ESRD (stage 5). There is a small body of literature indicating that ESRD is associated with diminished perceptual motor-coordination, impairments in intellectual functioning including decreased attention and concentration, and memory impairments. Some studies indicate that individuals with ESRD have a 2 to 7 times higher prevalence of cognitive impairment and dementia compared to the general population.

There is also evidence of a significant risk of cognitive impairment for those in Stage 3 and 4 of chronic renal disease. There is no evidence to suggest that risk of cognitive impairment in the early stages (stage 1 and 2) is significant enough to impair driving.

Research indicates that cognitive impairment ranging from mild to severe is common and often undiagnosed in dialysis patients. In particular, between 30% and 47% of older patients undergoing treatment by hemodialysis or peritoneal dialysis were classified as cognitively impaired. In the general population, 8% of Canadians 65 and over have dementia and another 17% have some form of cognitive impairment. One study also indicated that physicians had a tendency to underestimate cognitive impairment in patients undergoing dialysis.

Improvement in cognitive performance has been reported in individuals who have undergone a kidney transplant.

General debility

Individuals with chronic renal disease, particularly end-stage renal disease, may develop general debility resulting in a loss of stamina required to support the functions necessary for driving.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--|---|--|--|
| Chronic renal disease (Stage 3 and 4) End-stage renal disease | Persistent Impairment: Functional assessment | Cognitive May also result in general debility | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |
| Renal transplant | Persistent Impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |

14.5 Compensation

Individuals with chronic renal disease are not able to compensate for their functional impairment.

GUIDELINES

14.6 Private and commercial drivers with stage 1 or 2 renal disease

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|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have stage 1 or 2 chronic renal disease. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report, or• additional information from the treating physician. |
| Fitness guidelines | Individuals may drive. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will not reassess, other than routine commercial or age-related reassessment |
| Policy rationale | Stage 1 or 2 chronic renal disease is unlikely to cause impairment of the functions needed for driving. |

14.7 Private and commercial drivers with stage 3 or 4 renal disease

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have stage 3 or 4 chronic renal disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | Individuals may drive if cognitive screening or, where required, a cognitive functional assessment indicates that their ability to drive is not impaired. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving, or • where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every five years or in accordance with the schedule for routine commercial or age-related reassessment. |
| Policy rationale | Drivers with stage 3 or 4 chronic renal disease have a significant risk for cognitive impairment that could impair their functional ability to drive. |

14.8 Private drivers with end-stage renal disease

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|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who have end-stage renal disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • cognitive screening or, where required, a cognitive functional assessment indicates that their ability to drive is not impaired • they routinely follow their prescribed dialysis regimen • they do not drive if their dialysis treatment is delayed or circumstances do not allow them to maintain their dialysis schedule, and • they remain under regular medical supervision to ensure that any progression in their condition or development of co-morbid conditions is monitored. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they routinely follow their prescribed dialysis regimen, and • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving or, where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must not drive if your dialysis treatment is delayed or circumstances do not allow you to maintain your dialysis schedule, and • you must remain under regular medical supervision. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |

| | |
|-------------------------|---|
| Policy rationale | Drivers with end-stage renal disease are at significant risk of cognitive impairment and general debility. Regular dialysis is required to maintain overall functional ability. |
|-------------------------|---|

14.9 Commercial drivers with end-stage renal disease

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|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have end-stage renal disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • cognitive screening or, where required, a cognitive functional assessment indicates that their ability to drive is not impaired • they routinely follow their prescribed dialysis regimen • they do not drive if their dialysis treatment is delayed or circumstances do not allow them to maintain their dialysis schedule • they remain under regular medical supervision by a nephrologist or internist to ensure that any progression in their condition or development of co-morbid conditions is monitored, and • their work schedule has been approved by their treating physician as compatible with their dialysis regimen. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they routinely follow their prescribed dialysis regimen, and • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving or, where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must not drive if your dialysis treatment is delayed or circumstances do not allow you to maintain your dialysis schedule, and • you must remain under regular medical supervision. |
| Restrictions | No restrictions are required. |

14.10 Private and commercial drivers who have had a renal transplant

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have had a renal transplant. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | Individuals may drive if cognitive screening or, where required, a cognitive functional assessment indicates that their ability to drive is not impaired. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving, or • where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will not reassess, other than routine commercial or age-related reassessment. |
| Policy rationale | Even after a successful renal transplant, there may be persistent cognitive impairment. |

Chapter 15: Respiratory Diseases

BACKGROUND

15.1 About respiratory diseases

A number of respiratory diseases may interfere with the safe operation of a motor vehicle by causing reduced oxygen flow to the brain and subsequent cognitive impairment, including impairments in attention, memory, decision making, and judgement. Respiratory diseases that are most likely to affect cognitive functioning are those that are chronic in nature.

This chapter focuses on one of the most prevalent respiratory diseases, chronic obstructive pulmonary disease (COPD). However, other respiratory diseases also have the potential to impair driving due to reduced oxygen flow to the brain; where this is the case, the guidelines in this chapter also apply to them.

Chronic obstructive pulmonary disease

COPD refers to a group of diseases characterized by obstructed air flow such as emphysema and chronic bronchitis. Emphysema and chronic bronchitis frequently coexist and the term COPD is often applied to individuals suffering from these two disorders.

The level of general impairment caused by respiratory diseases is commonly described as mild, moderate, or severe, as described in the table below.

| Level of Impairment | Symptoms | Pulmonary Function Testing ⁶ result | Nature of general Impairment |
|---------------------|----------|---|------------------------------|
| Normal | None | FVC > 80% of predicted <i>and</i> FEV1 > 80% of predicted, <i>and</i> FEV1/FVC x 100 > 75% <i>and</i> DLCOsb > 80% of predicted | None |

⁶ FVC = Forced vital capacity; FEV1 = Forced expiratory volume in first second; FEV1/FVC x 100 = Using the previously selected values for FVC and FEV1, compute the ratio and express as percentage; DLCOsb = Single breath diffusing capacity

| Level of Impairment | Symptoms | Pulmonary Function Testing ⁶ result | Nature of general Impairment |
|----------------------------|---|---|---|
| Mildly Impaired | Dyspnea when walking quickly on level ground or when walking uphill; ability to keep pace with people of same age and body build walking on level ground, but not on hills or stairs. | FVC > 60 to 70% of predicted, <i>or</i> FEV1 > 60 to 79% of predicted, <i>or</i> FEV1/FVC x 100 60 to 74% <i>or</i> DLCOsb 60 to 79% of predicted. | Usually not correlated with diminished ability to perform most jobs |
| Moderately Impaired | Shortness of breath when walking for a few minutes or after 100m walking on level ground | FVC 51 to 59% of predicted <i>or</i> FEV1 41 to 59% of predicted, <i>or</i> FEV1/FVC x 100 41 to 59% <i>or</i> DLCOsb 41 to 59% of predicted. | Progressively lower levels of lung function correlated with diminished ability to meet the daily demands of many jobs |
| Severely Impaired | Too breathless to leave the house, breathless when dressing. The presence of untreated respiratory failure. | FVC 50% or less of predicted <i>or</i> FEV1 40% or less of predicted, <i>or</i> FEV1/FVC x 100 > 40% or less <i>or</i> DLCOsb > 40% or less of predicted. | Unable to meet the physical demands of most jobs, including travel to work |

15.2 Prevalence and incidence of chronic obstructive pulmonary disease

Estimates from the World Health Organization indicate that 80 million people have moderate to severe COPD. Chronic bronchitis affects individuals of all ages. Emphysema is more common among elderly individuals. In Canada men have a higher rate of COPD (6.3%) than women (5.2%). COPD increases in prevalence with age for both men and women with the highest prevalence for men over the age of 75 (9.1%).

15.3 Chronic obstructive pulmonary disease and adverse driving outcomes

There have been no studies that examine the relationship between respiratory diseases and adverse driving outcomes.

15.4 Effect of chronic obstructive pulmonary disease on functional ability to drive

Research indicates that individuals with COPD are at risk of cognitive impairment due to chronic hypoxemia. For those with cognitive impairment, the impairment tends to be greater for more complex and demanding cognitive tasks. This cognitive impairment may affect an individual's functional ability to drive.

Individuals with COPD also may develop general debility resulting in a loss of stamina required to support the functions necessary for driving.

Older individuals with COPD are more at-risk for functional impairment because they may experience:

- age-related declines in blood flow to the brain
- disease-related declines in arterial oxygen content, and
- both age and disease-related declines in physical activity which can exacerbate deconditioning.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|-----------------------------------|--|--|--|
| COPD or other respiratory disease | Persistent Impairment: Functional assessment | Cognitive May also result in general debility | Driver's Medical Examination Report ICBC road test SIMARD-MD DriveABLE assessment |

15.5 Compensation

Individuals with COPD may be able to compensate for their functional impairment by using supplemental oxygen.

GUIDELINES

15.6 Private and commercial drivers with mild impairment

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have mild impairment due to respiratory disease. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will not reassess, other than routine commercial or age-related reassessment. |
| Policy rationale | Mild impairment due to respiratory disease is unlikely to cause significant impairment of the functions needed for driving. |

15.7 Private drivers with moderate impairment

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private drivers who have moderate impairment due to respiratory disease. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every 5 years, or as recommended by the treating physician, unless routine age-related reassessment applies. |
| Policy rationale | Moderate impairment due to respiratory disease is unlikely to cause significant impairment of the functions needed for private driving. Reassessment is required to monitor for an increase in impairment that may affect fitness to drive. |

15.8 Commercial drivers with moderate impairment

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have moderate impairment due to respiratory disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>The OSMV will request an ICBC road test, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> <p>If an ICBC driver examiner recommends further assessment, the OSMV may request:</p> <ul style="list-style-type: none"> • additional information regarding the individual's medical condition, and/or • an assessment from an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | Individuals may drive if a functional assessment indicates they have adequate functional ability to operate the type of vehicle for which they are to be licensed. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if a functional assessment indicates they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with the schedule for routine commercial reassessment. |
| Policy rationale | Moderate impairment due to respiratory disease may cause significant impairment of the functions needed for commercial driving. Decisions about driver fitness should be based on an individual functional assessment. |

15.9 Private drivers with severe impairment

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who have severe impairment due to respiratory disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> <p>The OSMV will request an ICBC road test, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> <p>If an ICBC driver examiner recommends further assessment, the OSMV may request:</p> <ul style="list-style-type: none"> • additional information regarding the individual's medical condition, and/or • an assessment from an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | Individuals may drive if a functional assessment indicates they have adequate functional ability. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if a functional assessment indicates they have the functional ability required to operate a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every 2 years or as recommended by the treating physician. |
| Policy rationale | Severe impairment due to respiratory disease may cause significant impairment of the functions needed for private driving, including cognitive impairment. Decisions about driver fitness should be based on an individual functional assessment. |

15.10 Commercial drivers with severe impairment or requiring supplemental oxygen

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have severe impairment, or require supplemental oxygen while at rest, due to respiratory disease. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive. |
| OSMV determination guidelines | Individuals are not fit to drive. |
| Conditions | N/A |
| Restrictions | N/A |
| Reassessment guidelines | N/A |
| Policy rationale | Severe impairment or a requirement for supplemental oxygen due to respiratory disease generally indicates significant impairment of the functions needed for driving commercial vehicles. |

15.11 Private drivers requiring supplemental oxygen

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who require supplemental oxygen while at rest. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> <p>The OSMV will request an ICBC road test, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> <p>If an ICBC driver examiner recommends further assessment, the OSMV may request:</p> <ul style="list-style-type: none"> • additional information regarding the individual's medical condition, and/or • an assessment from an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • a road test while using supplemental oxygen indicates they have adequate functional ability, and • their licence is restricted to driving only with supplemental oxygen. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if a functional assessment while using supplemental oxygen indicates they have adequate functional ability to operate a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will impose the following restriction on the licence of an individual who is found fit to drive:</p> <p>51 May drive only when using supplemental oxygen</p> |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every 2 years or as recommended by the treating physician. |

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| <p>Policy rationale</p> | <p>Drivers who require supplemental oxygen due to respiratory disease may have significant impairment of the functions needed for private driving, including cognitive impairment. Decisions about driver fitness should be based on an individual functional assessment, including fitness to drive while using supplemental oxygen where required.</p> |
|--------------------------------|--|

15.12 Private and commercial drivers who have had a permanent tracheostomy

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|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have had a permanent tracheostomy. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive so long as they otherwise meet the guidelines for drivers with respiratory disease. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial or age-related reassessment, is required. |
| Policy rationale | A permanent tracheostomy is unlikely to cause any impairment of the functions needed for driving. |

Chapter 16: Vestibular Disorders

BACKGROUND

16.1 About vestibular disorders

The vestibular system - or balance system - is a sensory apparatus localized in the inner ears. It provides information to the nervous system about a person's movement and orientation in space.

Vestibular input contributes to:

- control of balance
- gaze stabilization so that a person can see clearly while moving, and
- spatial orientation so that a person knows their position with reference to gravity.

Vestibular disorders may result in:

- vertigo
- dizziness
- disturbed vision such as involuntary eye movement, and
- illusory movement of the visual world as a result of head movement.

A hallmark of vestibular disorders is vertigo, a term that refers to the sensation of spinning or whirling resulting from a disturbance in balance (equilibrium). Most commonly an attack of vertigo generally lasts less than one minute (30 seconds is typical) but it may last up to 60 minutes. A small number of people may experience vertigo lasting as long as 24 hours and an even smaller number may experience vertigo lasting up to, or beyond, 30 days.

Disorders of the vestibular system are classified as either peripheral or central.

Peripheral vestibular disorders

Peripheral disorders are characterized by episodic fluctuating symptoms; the dominant symptom is 'true spinning vertigo', that is the sensation of motion when no motion is occurring relative to earth's gravity. Peripheral vestibular disorders typically occur as a single acute episode or as recurrent acute episodes. However, complete bilateral hypofunction may result in severe and constant disequilibrium and motion sensitivity.

The most common peripheral vestibular disorders and the typical duration of an episodic event are shown in the following table.

| Disorder | Duration |
|--|---|
| benign paroxysmal positioning vertigo (BPPV) | 20-30 seconds |
| vestibular neuronitis (labyrinthitis) | Tends to be single attack lasting days to weeks |
| Meniere's Disease | 20 minutes – 24 hours |

Less common peripheral vestibular disorders are described in the following table.

| Disorder | Description |
|--|---|
| Tumarkin's Otolithic Crisis (drop attacks) | Sudden, spontaneous fall to the ground without prior warning |
| Complete bilateral vestibular hypofunction (absence of function) | May result in severe and constant disequilibrium and motion sensitivity |

Central vestibular disorders

Central vestibular disorders generally arise from underlying persistent medical conditions. Because of this, they are more likely to produce prolonged continuous non-specific dizziness. They are characterized by difficulty in interpretation of vestibular, visual and proprioceptive (the unconscious perception of movement and spatial orientation arising from stimuli within the body itself) inputs. Gaze stabilization and posture during locomotion may also be affected.

Common persistent medical conditions that can cause persistent central vestibular dysfunction are:

- cerebrovascular disease
- cervical vertigo
- epilepsy
- multiple sclerosis
- normal pressure hydrocephalus
- paraneoplastic syndromes (a response to the effects of a tumour in the body), and
- traumatic brain injury.

Common episodic medical conditions that are not related to structural brain disease but that may cause central vestibular disorders, and typical episode duration, are shown in the following table.

| Disorder | Duration |
|---|------------------------|
| migraines | a few seconds to hours |
| Psychogenic vertigo/anxiety (hyperventilation syndrome) | a few seconds to hours |

16.2 Prevalence and incidence of vestibular disorders

Peripheral vestibular disorders are more common than central vestibular disorders.

Age-related decrements in vestibular function are well documented and are likely due to degeneration at both the central and peripheral level. BPPV is reported as a common underlying cause of impairments in balance with aging.

A 2005 study on the frequency of moderate or severe vertigo and dizziness reported that 36.2% of women and 22.4% of men had experienced vertigo or dizziness at some point in their life.

One study identified that 32.5% of people with Meniere's disease developed drop attacks (Tumarkin's otolithic crisis); the attacks typically occurred in a flurry during a period of 1 year or less. No patient in the study required treatment for the drop attacks. Most people with this have a spontaneous remission of the drop attacks.

16.3 Vestibular disorders and adverse driving outcomes

The evidence linking vestibular disorders with adverse driving outcomes is weak because there has been little empirical research in this area. Nonetheless driving ability is dependent on the normal functioning of the vestibular mechanism to sense movement and position.

In subjective studies where drivers with vestibular disorders were asked about driving, driving difficulties were commonly reported and included a wide range of difficulties including driving in the rain, at night, pulling in and out of parking spaces, changing lanes, and freeway and rush hour driving.

In one study, 20-40% of drivers reported that they had had to pull off the road while driving due to vertigo. In a different study, 43% indicated that they had felt dizzy while driving; only 27% indicated that they 'always' or 'usually' got a warning that a dizzy spell was about to occur, with more than 1/3 indicating that they 'rarely' or 'never' get warnings. Of those who did get warnings, 56% indicated that there was less than a 5-second interval between the warning and the dizzy spell.

16.4 Effect of vestibular disorders on functional ability to drive

The functional effects associated with vestibular disorders can occur suddenly and with sufficient severity to make safe driving of any type of vehicle impossible.

People with vestibular disorders become disoriented more easily by extraneous visual stimuli or visual noise. This means that drivers are more likely to have difficulty driving in reduced visual conditions such as driving at night or in the rain.

Rapid head movements are also likely to elicit vertigo in people with vestibular disorders. This means that tasks such as parking a car, maneuvering in a parking space, lane maintenance and lane changes, and entering traffic may be risk factors for the onset of vertigo.

Research also indicates that damage to the vestibular system results in cognitive deficits in people with both peripheral and central vestibular disorders. People with vestibular disorders exhibit a range of cognitive deficits including those that are spatial and non-spatial. The cognitive deficits do not appear to be related to any particular episode of vertigo or dizziness and the deficits may occur even in those people who have no symptoms of dizziness or postural deficits.

Central vestibular disorders

The majority of central vestibular disorders have a persistent impact on driving because they arise from underlying persistent medical conditions. However, two common causes of central vestibular disorders - migraines and hyperventilation syndrome - are episodic in nature with short disease duration.

Peripheral vestibular disorders

Peripheral vestibular disorders are generally more episodic with, in general, shorter disease duration. Drivers, however, with complete bilateral vestibular hypofunction (absence of function) may have severe and constant disequilibrium and motion sensitivity forever. These drivers may have more difficulty driving, particularly during evening hours or on bumpy roads, and may not be safe to drive.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|---|---|-------------------------------------|--|
| Vestibular disorders resulting in episodic impairment, including: <ul style="list-style-type: none"> migraines psychogenic vertigo/ anxiety (hyperventilation syndrome) benign paroxysmal positioning vertigo (BPPV) Meniere's Disease vestibular neuronitis (labyrinthitis) Tumarkin's Otolithic Crisis (drop attacks) | Episodic impairment: Medical assessment – likelihood of impairment | Sensorimotor | Driver's Medical Examination Report Specialist's report |
| | Persistent Impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |
| Vestibular disorders resulting in persistent impairment, including: <ul style="list-style-type: none"> complete bilateral vestibular hypofunction (absence of function), or vestibular disorder resulting from an underlying persistent medical condition. | Persistent Impairment: Functional assessment | Sensorimotor Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |

16.5 Compensation

Individuals with vestibular disorders are not able to compensate for their functional impairment.

GUIDELINES

16.6 Private and commercial drivers with recurrent episodes that occur with warning symptoms

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|--------------------------------------|---|
| Application | <p>These guidelines apply to private and commercial drivers with a vestibular disorder who have recurrent episodes of vestibular dysfunction that occur with warning symptoms. This may include individuals with:</p> <ul style="list-style-type: none"> • benign paroxysmal positioning vertigo (BPPV) • Meniere's disease • vestibular neuronitis (labyrinthitis) • migraines, or • psychogenic vertigo/anxiety (hyperventilation syndrome). |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • the warning symptoms are of sufficient duration, and • not incapacitating, <p>such that a driver would have the time and capability to pull off the road.</p> <p>Drivers that experience an episode of vestibular dysfunction may not resume driving until all symptoms associated with the episode have stopped.</p> |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the warning symptoms are of sufficient duration, and • not incapacitating, <p>such that a driver would have the time and capability to pull off the road.</p> <p>Drivers that experience an episode of vestibular dysfunction may not resume driving until all symptoms associated with the episode have stopped.</p> |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • if you experience an episode of vestibular dysfunction, you must not resume driving until all symptoms associated with the episode have stopped. |
| Restrictions | No restrictions are required. |

16.7 Private and commercial drivers with recurrent episodes that occur without warning symptoms

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| Application | <p>These guidelines apply to private and commercial drivers with a vestibular disorder who have recurrent episodes of vestibular dysfunction that occur without warning symptoms. This may include individuals with:</p> <ul style="list-style-type: none"> • benign paroxysmal positioning vertigo (BPPV) • Meniere's disease • vestibular neuronitis (labyrinthitis) • migraines, or • psychogenic vertigo/anxiety (hyperventilation syndrome). |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a specialist. |
| Fitness guidelines | <p>Individuals must immediately stop driving and may not drive for a minimum of 6 months after an episode. After 6 months, individuals may drive:</p> <ul style="list-style-type: none"> • <i>private vehicles</i> if their treating physician indicates that their symptoms have been controlled or have abated • <i>commercial vehicles</i> if a specialist indicates that their symptoms have been controlled or have abated. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 months since they last had an episode, and • for private drivers, their treating physician indicates that their symptoms have been controlled or have abated, or • for commercial drivers, a specialist, or their treating physician if the physician has been treating the patient for two years or more, indicates that their symptoms have been controlled or have abated. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must immediately stop driving and report to the OSMV and your physician if you have an episode of vestibular dysfunction. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial or age-related assessment, is required. |
| Policy rationale | Where episodes of vestibular dysfunction are not preceded by warning symptoms or the warning symptoms are not sufficient to allow the driver to safely stop driving, evidence that further episodes |

| | |
|--|---|
| | are unlikely to occur is required to mitigate the risk. Consensus medical opinion suggests that this evidence should include a minimum period of 6 months without an episode and opinion of the treating physician that this episode-free period reflects effective treatment or abatement of the episodes. |
|--|---|

16.8 Private and commercial drivers with drop attacks

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|--------------------------------------|--|
| Application | These guidelines apply to private and commercial drivers with drop attacks resulting from Tumarkin's otolithic crisis. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. |
| Fitness guidelines | Individuals may drive if: <ul style="list-style-type: none"> • a doctor confirms the driver has been successfully treated, or • 6 months has passed since the most recent drop attack. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • their treating physician indicates that the individual has been successfully treated, or • it has been at least 6 months since the last drop attack. |
| Conditions | The OSMV will impose the following condition on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must immediately stop driving and report to the OSMV and your physician if you have a drop attack. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If an attack occurred within the past 12 months, the OSMV will reassess in one year. If no new attacks are reported at that time, the OSMV will reassess in 5 years, or in accordance with the schedule for routine commercial or age-related reassessment. If no new attacks are reported at that time, no further reassessment is required, other than routine commercial or age-related reassessment. |
| Policy rationale | For drop attacks, which occur without warning, evidence that further attacks are unlikely to occur is required to mitigate the risk. Consensus medical opinion suggests that this evidence should be an opinion from the treating physician that the driver has been successfully treated or that 6 months has passed without an attack. |

16.9 Private and commercial drivers who experience a single episode of vestibular dysfunction

| | |
|--------------------------------------|---|
| Application | These guidelines apply to private and commercial drivers who experience a single episode of vestibular dysfunction. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive until their condition has subsided and the acute symptoms have resolved. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial or age-related reassessment, is required. |
| Policy rationale | A single episode of vestibular dysfunction is a transient impairment. |

16.10 Private and commercial drivers with vestibular disorders resulting in persistent impairment

| | |
|--------------------------------------|---|
| Application | These guidelines apply to private and commercial drivers with vestibular disorders resulting in persistent impairment. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>The OSMV will request an assessment of the individual's sensorimotor function from an occupational therapist or driver rehabilitation specialist, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | Individuals may or may not drive based on the result of their cognitive and/or sensorimotor functional assessment. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if a functional assessment indicates they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will determine the appropriate reassessment interval on an individual basis. |
| Policy rationale | Persistent vestibular dysfunction may cause significant impairment of the functions needed for driving. Decisions about driver fitness should be based on an individual functional assessment. |

Chapter 17: Cardiovascular Disease and Disorders

BACKGROUND

17.1 About cardiovascular disease

Cardiovascular disease is an umbrella term used to describe a variety of disorders relating to the heart and blood vessels.

Coronary artery disease

Coronary artery disease, which is also called coronary, ischemic or atherosclerotic heart disease, is characterized by the presence of atherosclerosis in the arteries of the heart. Atherosclerosis is the progressive build up of fatty deposits called plaque, which narrows the coronary arteries and reduces blood flow to the heart. Complications of coronary artery disease include:

- angina (pain or discomfort due to lack of oxygen to the heart muscle)
- myocardial infarction (heart attack), and
- ischemic cardiomyopathy (permanent damage to the heart muscle).

Disturbances of cardiac rhythm

Disturbances of cardiac rhythm, or arrhythmias, include:

- tachycardia (rapid heart rate)
- bradycardia (slow heart rate)
- fibrillation or flutter (abnormal twitching of the heart muscle), and
- heart block.

These arrhythmias may arise from the heart muscle itself or the conduction system and are often secondary to underlying heart disease.

Valvular heart disease

Disease affecting the heart valves may result in stenosis and regurgitation, and is associated with an increased risk of thromboembolism.

In valvular stenosis, the valve opening is smaller than normal due to hardening or fusing of the valve's leaflets. This may cause the heart to have to work harder to pump blood through the valves. In valvular regurgitation or "leaky valve", the valve does not close tightly enough, allowing some blood to leak backwards across the valve. As the leak worsens, the heart has to work harder to make up for the leaky valve, and less blood may flow to the rest of the body. Stenosis and regurgitation may coexist.

Individuals who have undergone valve replacement surgery are subject to a certain irreducible incidence of late complications such as thromboembolism, dehiscence, infection and mechanical malfunction.

Congestive heart failure

Congestive heart failure usually is a chronic, progressive condition in which the heart is unable to pump the quantity of blood required to meet the body's needs. It is generally the result of heart disease but may be secondary to non-cardiac conditions such as fluid overload and anemia.

The severity of congestive heart failure can be assessed by measuring the fraction of blood being pumped out of the left ventricle with each beat. This is expressed as a ratio called the left ventricle ejection fraction (LVEF). Healthy individuals generally have an LVEF greater than 55%.

The New York Heart Association (NYHA) functional classification system provides a simple, clinical measure for assessing the degree of heart failure. This system describes the effect of cardiovascular disease on an individual's general physical activity, according to the categories shown in the following table.

| Category | Description |
|-----------------|---|
| I | No symptoms and no limitation in ordinary physical activity. Comfortable at rest. |
| II | Mild symptoms and slight limitation during ordinary activity. Comfortable at rest. |
| III | Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at rest. |
| IV | Severe limitations. Experiences symptoms even while at rest. |

Cardiomyopathy

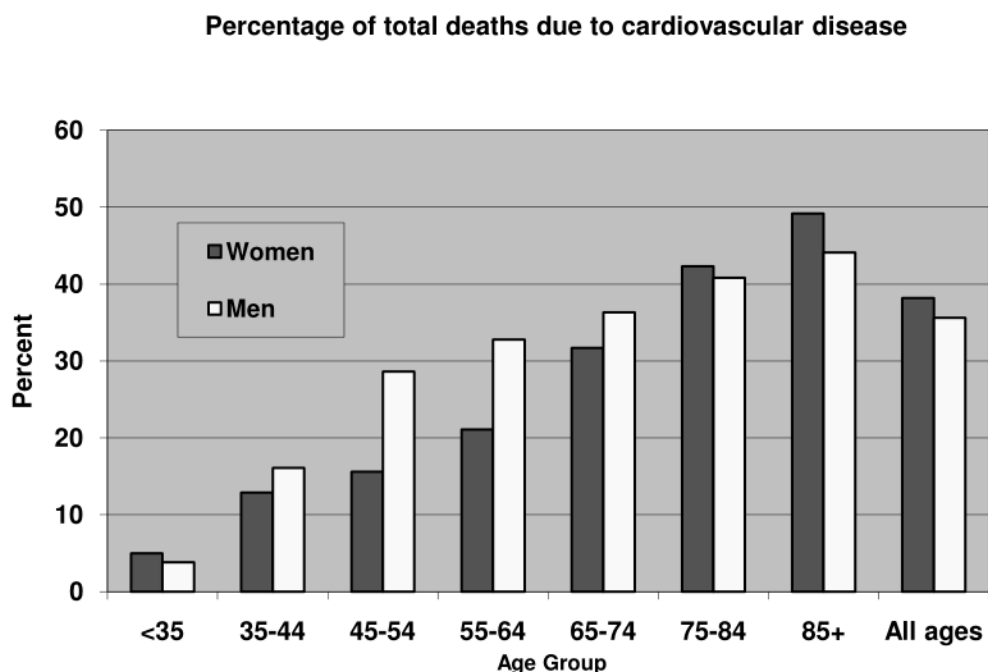
Cardiomyopathy refers to a change in the size, strength or flexibility in the heart muscle. These changes can reduce the amount of blood being pumped out of the heart, and may lead to congestive heart failure. Cardiomyopathy is associated with an increased risk of arrhythmias.

Abnormal blood pressure

Hypertension (high blood pressure) is the most common and most important risk factor for developing cardiovascular disease and stroke. Hypotension (low blood pressure) is less common than hypertension. Individuals with hypotension may experience syncope.

17.2 Prevalence and incidence of cardiovascular disease

Cardiovascular disease is a major cause of death, disability and health care costs in Canada. Although cardiovascular disease death rates have been declining since the mid-1960s, statistics from 1997 indicate that cardiovascular disease was still the leading cause of death in Canada, accounting for 36% of all deaths in men and 38% in women. As shown in the graph below, the proportion of deaths caused by cardiovascular disease increases dramatically with age.



17.3 Cardiovascular disease and adverse driving outcomes

Research indicates that drivers with cardiovascular disease as a whole have a higher risk for adverse driving outcomes than those without cardiovascular disease. However, there is relatively little research on the effects of specific cardiovascular disorders and driving outcomes.

17.4 Effect of cardiovascular disease on functional ability to drive

The effect of cardiovascular disease on an individual's functional ability to drive may be episodic or persistent.

Episodic impairment

The potential episodic impairment is a partial or complete loss of consciousness that incapacitates the driver. This may be caused by a variety of cardiovascular events such as:

- bradyarrhythmias
- tachyarrhythmias
- myocardial disease (massive myocardial infarction)
- left ventricular myocardial restriction or constriction
- pericardial constriction or tamponade
- aortic outflow tract obstruction
- aortic valvular stenosis, or
- hypertrophic obstructive cardiomyopathy.

Persistent impairment

Individuals with congestive heart failure may develop persistent cognitive impairment, loss of stamina or general debility as a result of a reduction of oxygen to the brain, organs and tissues. Cardiac arrest may also cause persistent cognitive impairment where a loss of blood to the brain causes brain damage.

Neurocognitive deficits can occur in individuals undergoing intracardiac procedures (e.g. valve surgery) or extracardiac procedures (e.g. coronary artery bypass graft (CABG) surgery). However, the majority of studies investigating cognitive decline have focused on individuals undergoing CABG surgery. The results of those studies indicate that a significant number of individuals experience post-operative cognitive decline (POCD) for several months after surgery, with documented declines in memory, attention, speed of processing, and executive functioning. Studies indicate that between 20% and 79% of individuals experience POCD between 6 weeks and 6 months of CABG surgery, with a majority of the studies showing a rate of 45% or higher. In those studies that have followed individuals for more than 6 months post-surgery, the results indicate that up to 35% of individuals will show POCD one year after surgery. The current understanding is that POCD is the result of a number of factors associated with cardiac treatment, rather than a single factor such as the use of cardiopulmonary bypass.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--|---|---|--|
| Coronary artery disease Arrhythmias Valvular heart disease Cardiomyopathy | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Specialist's report |
| Congestive heart failure | Persistent Impairment: Functional assessment | Cognitive May also result in general debility or lack of stamina | Driver's Medical Examination Report ICBC road test SIMARD-MD DriveABLE assessment |
| | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Specialist's report |
| Post cardiac arrest Post-operative cognitive decline (POCD) | Persistent Impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |

17.5 Compensation

Individuals with cardiovascular disease are not able to compensate for their functional impairment.

GUIDELINES

17.6 Policy rationale

These guidelines are based primarily on recommendations contained in the final report of the 2003 Canadian Cardiovascular Society (CCS) Consensus Conference Assessment of the Cardiac Patient for Fitness to Drive and Fly. The CCS recommendations focus exclusively on the potential episodic impairments associated with cardiovascular diseases.

Additional guidelines have been added to address potential persistent cognitive impairment caused by congestive heart failure, and the potential for co-morbid cognitive impairment in relation to cardiac arrest, and post-operative cognitive decline (POCD) following coronary artery bypass graft (CABG) surgery. Where guidelines have been added or changed, the rationale is included in the table.

17.7 Private and commercial drivers with congenital heart defects

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have a congenital heart defect. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report• additional information from the treating physician, or• an assessment from a cardiologist. |
| Fitness guidelines | Individuals may drive if they meet any guidelines related to a specific cardiovascular condition or event. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the defect has been repaired and the treating physician does not indicate any concerns, no reassessment, other than routine commercial or age-related reassessment, is required. If the defect has not been repaired, the OSMV will reassess every 5 years, unless routine commercial or age-related reassessment applies. |
| Policy rationale | Congenital heart defects are not specifically addressed in the CCS guidelines. It is included here in recognition that a congenital heart defect may be reported to OSMV. The nature of congenital heart defects and their treatment is variable; therefore there are no specific fitness guidelines for them. |

17.8 Private drivers with coronary artery disease

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private drivers who have coronary artery disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | Individuals may not drive if they have an angiographic demonstration of 70% or greater reduction in the diameter of the left main coronary artery, unless successfully treated with revascularization. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have an angiographic demonstration of less than a 70% reduction in the diameter of the left main coronary artery, or • where they have a 70% or greater reduction in the diameter of the left main coronary artery, it has been successfully treated with revascularization |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, or as recommended by the treating physician, unless routine age-related reassessment applies. |

17.9 Commercial drivers with coronary artery disease

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have coronary artery disease. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | Individuals may not drive if they have an angiographic demonstration of 50% or greater reduction in the diameter of the left main coronary artery, unless successfully treated with revascularization. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have an angiographic demonstration of less than a 50% reduction in the diameter of the left main coronary artery, or • where they have a 50% or greater reduction in the diameter of the left main coronary artery, it has been successfully treated with revascularization |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment, or as recommended by the treating physician. |

17.10 Private and commercial drivers with asymptomatic coronary artery disease or stable angina

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have : <ul style="list-style-type: none"> • asymptomatic coronary artery disease, or • stable angina. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | No restrictions. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine commercial or age-related reassessment applies. |

17.11 Private drivers who have had CABG surgery

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|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who have had coronary artery bypass graft (CABG) surgery |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been 1 month or more since CABG surgery, and • they have sufficient cognitive function to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving, or • where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every five years, unless routine age-related reassessment applies. |
| Policy rationale | The guidelines regarding cognitive screening are not included in the CCS recommendations. These have been added to address the potential for persistent cognitive impairment associated with post operative cognitive decline (POCD) following CABG surgery. |

17.12 Commercial drivers who have had CABG surgery

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| Application | These guidelines apply to driver fitness determinations for commercial drivers who have had coronary artery bypass graft (CABG) surgery |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been 3 months or more since CABG surgery, and • they have sufficient cognitive function to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving, or • where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess in accordance with routine commercial reassessment. |
| Policy rationale | The guidelines regarding cognitive screening are not included in the CCS recommendations. These have been added to address the potential for persistent cognitive impairment associated with post operative cognitive decline (POCD) following CABG surgery. |

17.13 Private and commercial drivers who have experienced cardiac arrest

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have experienced cardiac arrest |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have sufficient cognitive function to drive, and • they meet any other applicable cardiovascular disease guidelines. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving, or • where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every five years, unless routine commercial or age-related reassessment applies. |
| Policy rationale | Cardiac arrest is not specifically addressed in the CCS recommendations. The guidelines are included here to address the potential for persistent cognitive impairment as a result of cardiac arrest. |

17.14 Private and commercial drivers who have premature atrial or ventricular contractions

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have premature atrial or ventricular contractions. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | Individuals may drive if they have no associated impaired level of consciousness. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if they have no associated impaired level of consciousness. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If there is no underlying cardiovascular disease, no reassessment is required, other than routine commercial or age-related reassessment. Where there is an underlying cardiovascular disease, the OSMV will reassess according to the guidelines for that condition.</p> |

17.15 Private drivers who have ventricular fibrillation with no reversible cause

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have ventricular fibrillation (VF) with no reversible cause. These guidelines do not apply to drivers who have VF due to any of the following reversible causes:</p> <ul style="list-style-type: none"> • VF within 24 hours of myocardial infarction • VF during coronary angiography • VF with electrocution, or • VF secondary to drug toxicity. <p>If VF has a reversible cause, it is considered a transient condition. The Canadian Cardiovascular Society recommendation for VF with a reversible cause is included in 17.55.</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been 6 months or more since their last episode of VF, and • they have sufficient cognitive function to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least six months since their last episode of VF, and • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving or, where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every five years, or as recommended by the treating physician, unless routine age-related reassessment applies.</p> |

17.16 Commercial drivers who have ventricular fibrillation with no reversible cause

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have ventricular fibrillation (VF) with no reversible cause. These guidelines do not apply to drivers who have VF due to any of the following reversible causes:</p> <ul style="list-style-type: none"> • VF within 24 hours of myocardial infarction • VF during coronary angiography • VF with electrocution, or • VF secondary to drug toxicity. <p>If VF has a reversible cause, it is considered a transient condition. The Canadian Cardiovascular Society recommendation for VF with a reversible cause is included in 17.53.</p> |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive. |
| OSMV determination guidelines | Individuals are not fit to drive. |
| Conditions | N/A |
| Restrictions | N/A |
| Reassessment guidelines | N/A |

17.17 Private and commercial drivers who have hemodynamically unstable VT

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have hemodynamically unstable ventricular tachycardia (VT). |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | Individuals may drive if the underlying condition has been successfully treated. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if the underlying condition has been successfully treated. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years or as recommended by the treating physician, unless routine commercial or age-related reassessment applies. |

17.18 Private drivers who have sustained VT and an LVEF of <30%

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have sustained ventricular tachycardia (VT) with:</p> <ul style="list-style-type: none"> • a left ventricular ejection fraction (LVEF) of < 30%, and • no associated impaired level of consciousness. <p>Sustained VT means VT having:</p> <ul style="list-style-type: none"> • a cycle length of 500 msec or less, and • lasting 30 seconds or more or causing hemodynamic collapse. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been 3 months or more since their last episode, and • they have been treated with an ICD and meet the guidelines for an ICD. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since their last episode, and • if they have not been treated with an implantable cardioverter defibrillator (ICD), an assessment by a cardiologist supports driving, or • if they have been treated with an ICD: <ul style="list-style-type: none"> - they are assessed as NYHA Class I, II or III - there is no evidence of ICD malfunction, and - they have not suffered an impaired level of consciousness or disability as a result of delivery of ICD therapy within the past six months. |
| Conditions | <p>The OSMV will impose the following condition on an individual who has been treated with an ICD and is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV if you suffer an impaired level of consciousness or disability as a result of delivery of ICD therapy. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the individual's condition is controlled and stable, the OSMV will reassess every five years, or as recommended by the treating physician, unless routine commercial or age-related reassessment applies. |
| Policy rationale | The requirement for treatment with an ICD is not included in the CCS recommendations. This requirement is a logical inference based on a comparison of the CSS recommendations where the LVEF is <30% |

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| | and where it is >30%. Nonetheless, there may be circumstances where an individual who has not been treated with an ICD may be fit to drive based on the assessment of a cardiologist. |
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17.19 Private drivers who have sustained VT and an LVEF of $\geq 30\%$

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have sustained ventricular tachycardia (VT):</p> <ul style="list-style-type: none"> • with a left ventricular ejection fraction (LVEF) of $\geq 30\%$ • with no associated impaired level of consciousness, and • an implantable cardioverter defibrillator (ICD) has not been recommended. <p>Sustained VT means VT having:</p> <ul style="list-style-type: none"> • a cycle length of 500 msec or less, and • lasting 30 seconds or more or causing hemodynamic collapse. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been 4 weeks or more since their last episode, and • they have been successfully treated with radiofrequency ablation plus a one week waiting period or successful pharmacologic treatment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 4 weeks since their last episode, and • the treating physician indicates they have been successfully treated with radiofrequency ablation or pharmacologic treatment. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |

17.20 Commercial drivers who have sustained VT and an LVEF of <30%

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have sustained ventricular tachycardia (VT) with:</p> <ul style="list-style-type: none"> • a left ventricular ejection fraction (LVEF) of < 30%, and • no associated impaired level of consciousness. <p>Sustained VT means VT having:</p> <ul style="list-style-type: none"> • a cycle length of 500 msec or less, and • lasting 30 seconds or more or causing hemodynamic collapse. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive. |
| OSMV determination guidelines | Individuals are not fit to drive. |
| Conditions | N/A |
| Restrictions | N/A |
| Reassessment guidelines | N/A |

17.21 Commercial drivers who have sustained VT and an LVEF of $\geq 30\%$

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have sustained ventricular tachycardia (VT) with:</p> <ul style="list-style-type: none"> • a left ventricular ejection fraction (LVEF) of $\geq 30\%$ • no associated impaired level of consciousness, and • an implantable cardioverter defibrillator (ICD) has not been recommended. <p>Sustained VT means VT having:</p> <ul style="list-style-type: none"> • a cycle length of 500 msec or less, and • lasting 30 seconds or more or causing hemodynamic collapse. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been 3 months or more since their last episode, and • they have been successfully treated with radiofrequency ablation plus a one week waiting period or successful pharmacologic treatment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since their last episode, and • the treating physician indicates they have been successfully treated with radiofrequency ablation or pharmacologic treatment. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |

17.22 Private and commercial drivers who have nonsustained VT

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have nonsustained ventricular tachycardia (VT). Nonsustained VT means VT having: <ul style="list-style-type: none">• a cycle length of 500 msec or less, and• lasting less than 30 seconds without hemodynamic collapse. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | No restrictions. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If there is no underlying cardiovascular disease, no reassessment is required, other than routine commercial or age-related reassessment. Where there is an underlying cardiovascular disease, the OSMV will reassess according to the guidelines for that condition. |

17.23 Private and commercial drivers who have had paroxysmal SVT, AF or AFL

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have had paroxysmal: <ul style="list-style-type: none">• supraventricular tachycardia (SVT)• artial fibrillation (AF), or• atrial flutter (AFL) with no associated impaired level of consciousness. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in five years. If there have been no further occurrences at that time, no further reassessment is required, unless routine commercial or age-related reassessment applies. |

17.24 Private and commercial drivers who have had paroxysmal SVT, AF or AFL with impaired consciousness

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| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have had paroxysmal:</p> <ul style="list-style-type: none"> • supraventricular tachycardia (SVT) • atrial fibrillation (AF), or • atrial flutter (AFL) <p>with an associated impaired level of consciousness.</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have been on medical therapy for a minimum of 3 months with no recurrence of paroxysmal SVT, AF or AFL with impaired level of consciousness, or their SVT • for individuals with paroxysmal SVT, it has been successfully treated with radiofrequency ablation • for individuals with paroxysmal AF, they have had AV node ablation and pacemaker implantation, and • for individuals with paroxysmal AFL, they have had a successful isthmus ablation with proven establishment of bidirectional isthmus block. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have been on medical therapy for a minimum of 3 months with no recurrence of paroxysmal SVT, AF, or AFL with impaired level of consciousness • for drivers with paroxysmal SVT, it has been successfully treated with radiofrequency ablation • for drivers with paroxysmal AF, they have had AV node ablation and pacemaker implantation, and • for drivers with paroxysmal AFL, they have had a successful isthmus ablation with proven establishment of bidirectional isthmus block |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in five years. If there have been no further occurrences at that time, no further reassessment is required, unless routine commercial or age-related reassessment applies. For |

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| | individuals who have had pacemaker implantation, the reassessment guidelines under 17.29 apply. |
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17.25 Private and commercial drivers who have persistent or permanent paroxysmal SVT, AF or AFL

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| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have persistent or permanent paroxysmal:</p> <ul style="list-style-type: none"> • supraventricular tachycardia (SVT) • atrial fibrillation (AF), or • atrial flutter (AFL). |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have adequate ventricular rate control, and • they do not experience an impaired level of consciousness. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have adequate ventricular rate control, and • they do not experience an impaired level of consciousness. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine commercial or age-related reassessment applies. |

17.26 Private and commercial drivers who have sinus node dysfunction

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have sinus node dysfunction. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may be found fit to drive if:</p> <ul style="list-style-type: none"> • they have no associated symptoms, or • where they have associated symptoms, the sinus node dysfunction has been successfully treated with a pacemaker and they meet the guidelines for that treatment |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have no associated symptoms, or • where they have associated symptoms, the sinus node dysfunction has been successfully treated with a pacemaker and they meet the guidelines for that treatment |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine commercial or age-related reassessment applies. |

17.27 Private drivers with atrioventricular (AV) or intraventricular block

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| Application | These guidelines apply to driver fitness determinations for private drivers with an atrioventricular (AV) or intraventricular block. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals with an:</p> <ul style="list-style-type: none"> • isolated first degree AV block • isolated right bundle branch block (RBBB), or • isolated left anterior or posterior fascicular block <p>may drive.</p> <p>Individuals with a:</p> <ul style="list-style-type: none"> • left bundle branch block (LBBB) • bifascicular block • second degree AV block/Mobitz I • first degree AV block + bifascicular block, or • congenital third degree AV block <p>may drive if they have had no associated impaired level of consciousness.</p> <p>Individuals with a:</p> <ul style="list-style-type: none"> • second degree AV block; Mobitz II (distal AV block) • alternating LBBB and RBBB, or • acquired third degree AV block <p>may not drive.</p> |
| OSMV determination guidelines | <p>Individuals with an:</p> <ul style="list-style-type: none"> • isolated first degree AV block • isolated right bundle branch block (RBBB), or • isolated left anterior or posterior fascicular block <p>may drive.</p> <p>Individuals with a:</p> <ul style="list-style-type: none"> • left bundle branch block (LBBB) • bifascicular block • second degree AV block/Mobitz I • first degree AV block + bifascicular block, or • congenital third degree AV block <p>may drive if they have had no associated impaired level of consciousness.</p> |

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| | <p>Individuals with a:</p> <ul style="list-style-type: none"> • second degree AV block; Mobitz II (distal AV block) • alternating LBBB and RBBB, or • acquired third degree AV block <p>may not drive.</p> |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine age-related reassessment applies. |

17.28 Commercial drivers with atrioventricular (AV) or intraventricular block

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| Application | These guidelines apply to driver fitness determinations for commercial drivers with an atrioventricular (AV) or intraventricular block. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals with an:</p> <ul style="list-style-type: none"> • isolated first degree AV block • isolated right bundle branch block (RBBB), or • isolated left anterior or posterior fascicular block <p>may drive.</p> <p>Individuals with a:</p> <ul style="list-style-type: none"> • left bundle branch block (LBBB) • bifascicular block • second degree AV block/Mobitz I • first degree AV block + bifascicular block, or • congenital third degree AV block <p>may drive if:</p> <ul style="list-style-type: none"> • they have had no associated impaired level of consciousness, and • they have an annual Holter showing no higher grade AV block. <p>Individuals with a congenital third degree AV block may drive if:</p> <ul style="list-style-type: none"> • they have had no associated impaired level of consciousness • they have a QRS duration ≤ 110 msec, and • they have an annual Holter showing no documented pauses ≥ 3 seconds. <p>Individuals with a:</p> <ul style="list-style-type: none"> • second degree AV block; Mobitz II (distal AV block) • alternating LBBB and RBBB, or • acquired third degree AV block <p>may not drive.</p> |
| OSMV determination guidelines | <p>Individuals with an:</p> <ul style="list-style-type: none"> • isolated first degree AV block • isolated right bundle branch block (RBBB), or • isolated left anterior or posterior fascicular block <p>may drive.</p> |

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| | <p>Individuals with a:</p> <ul style="list-style-type: none"> • left bundle branch block (LBBB) • bifascicular block • second degree AV block/Mobitz I • first degree AV block + bifascicular block, or • congenital third degree AV block <p>may drive if:</p> <ul style="list-style-type: none"> • they have had no associated impaired level of consciousness, and • they have an annual Holter showing no higher grade AV block. <p>Individuals with a congenital third degree AV block may drive if:</p> <ul style="list-style-type: none"> • they have had no associated impaired level of consciousness • they have a QRS duration ≤ 110 msec, and • they have an annual Holter showing no documented pauses ≥ 3 seconds. <p>Individuals with a:</p> <ul style="list-style-type: none"> • second degree AV block; Mobitz II (distal AV block) • alternating LBBB and RBBB, or • acquired third degree AV block <p>may not drive.</p> |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment. |

17.29 Private drivers with permanent pacemakers

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| Application | These guidelines apply to driver fitness determinations for private drivers with permanent pacemakers. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 1 week since pacemaker implant • they have not experienced any episodes of impaired level of consciousness since the implant • they show normal sensing and capture on a post-implant ECG, and • they have their pacemaker checked regularly at a pacemaker clinic and the checks reveal no pacemaker malfunction. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 1 week since pacemaker implant • they have not experienced any episodes of impaired level of consciousness since the implant • they show normal sensing and capture on a post-implant ECG, and • they have their pacemaker checked regularly at a pacemaker clinic and the checks reveal no pacemaker malfunction |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine age-related reassessment applies. |

17.30 Commercial drivers with permanent pacemakers

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| Application | These guidelines apply to driver fitness determinations for commercial drivers with permanent pacemakers. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 1 month since pacemaker implant • they have not experienced any episodes of impaired level of consciousness since the implant • they show normal sensing and capture on a post-implant ECG, and • they have their pacemaker checked regularly at a pacemaker clinic and the checks reveal no pacemaker malfunction. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 1 month since pacemaker implant • they have not experienced any episodes of impaired level of consciousness since the implant • they show normal sensing and capture on a post-implant ECG, and • they have their pacemaker checked regularly at a pacemaker clinic and the checks reveal no pacemaker malfunction. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment. |

17.31 Private drivers who have declined an ICD or have an ICD implanted as primary prophylaxis

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers who:</p> <ul style="list-style-type: none"> • have had an implantable cardioverter defibrillator (ICD) implanted as a primary prophylaxis, or • have declined an ICD recommended as primary prophylaxis <p>When implanted as a primary prophylaxis, the ICD is implanted to prevent sudden cardiac death in individuals considered to be at high risk but who have not had an episode of ventricular arrhythmia.</p> <p>Individuals whose ICD also regulates pacing for bradycardia must also meet the guidelines for permanent pacemakers outlined in 17.29</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II or III • it has been at least 4 weeks since ICD implant (if applicable), and • they have their ICD checked regularly at a device clinic and the checks reveal no ICD malfunction. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II or III, and • if they have been treated with an ICD: <ul style="list-style-type: none"> - there is no evidence of ICD malfunction, and - they have not suffered an impaired level of consciousness or disability as a result of delivery of ICD therapy within the past six months. |
| Conditions | <p>The OSMV will impose the following condition on an individual who has been treated with an ICD and is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV if you suffer an impaired level of consciousness or disability as a result of delivery of ICD therapy. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the individual's condition is controlled and stable, the OSMV will reassess every five years, unless a shorter period is recommended by the treating physician or routine age-related reassessment applies. |

17.32 Private drivers who have an ICD implanted as secondary prophylaxis for sustained VT

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have had an implantable cardioverter defibrillator (ICD) implanted as a secondary prophylaxis for sustained VT with no impaired level of consciousness.</p> <p>When implanted as a secondary prophylaxis, the ICD is implanted to prevent sudden cardiac death in individuals who have survived a cardiac arrest or who suffer from malignant arrhythmias that do not respond readily to medical treatment.</p> <p>Individuals whose ICD also regulates pacing for bradycardia must also meet the guidelines for permanent pacemakers outlined in 17.29.</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II or III • it has been at least 1 week since ICD implant • it has been 3 months or more since their last episode of sustained VT, and • they have their ICD checked regularly at an ICD clinic and the checks reveal no ICD malfunction. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II or III • it has been at least 3 months since their last episode of sustained VT • there is no evidence of ICD malfunction, and • they have not suffered an impaired level of consciousness or disability as a result of delivery of ICD therapy within the past six months. |
| Conditions | <p>The OSMV will impose the following condition on an individual who has been treated with an ICD and is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV if you suffer an impaired level of consciousness or disability as a result of delivery of ICD therapy. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the individual's condition is controlled and stable, the OSMV will reassess every five years, unless a shorter period is recommended by |

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| | the treating physician or routine age-related reassessment applies. |
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17.33 Private drivers where ICD therapy (shock or ATP) has been delivered

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| Application | These guidelines apply to driver fitness determinations for private drivers where ICD therapy (shock or ATP) has been delivered and there is an associated impaired level of consciousness, or the therapy delivered by the device was disabling. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report• additional information from the treating physician, or• an assessment from a cardiologist. |
| Fitness guidelines | Individuals may drive if it has been at least 6 months since the event. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if it has been at least six months since the event. |
| Conditions | The OSMV will impose the following condition on an individual who is found fit to drive: <ul style="list-style-type: none">• you must report to the OSMV if you suffer an impaired level of consciousness or disability as a result of delivery of ICD therapy. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with the reassessment guidelines for the underlying cardiovascular condition. |

17.34 Private drivers who have an ICD implanted as secondary prophylaxis for VF or VT

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have had an implantable cardioverter defibrillator (ICD) implanted as a secondary prophylaxis for VF or VT with an impaired level of consciousness.</p> <p>When implanted as a secondary prophylaxis, the ICD is implanted to prevent sudden cardiac death in individuals who have survived a cardiac arrest or who suffer from malignant arrhythmias that do not respond readily to medical treatment.</p> <p>Individuals whose ICD also regulates pacing for bradycardia must also meet the guidelines for permanent pacemakers outlined in 17.29.</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if it has been at least 6 months since their last episode of sustained symptomatic VT or syncope judged to be likely due to VT or cardiac arrest.</p> |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 months since their last episode of sustained symptomatic VT or syncope judged to be likely due to VT or cardiac arrest • there is no evidence of ICD malfunction, and • they have not suffered an impaired level of consciousness or disability as a result of delivery of ICD therapy within the past six months. |
| Conditions | <p>The OSMV will impose the following condition on an individual who has been treated with an ICD and is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV if you suffer an impaired level of consciousness or disability as a result of delivery of ICD therapy. |
| Restrictions | <p>No restrictions are required.</p> |
| Reassessment guidelines | <p>If the individual's condition is controlled and stable, the OSMV will reassess every five years, unless a shorter period is recommended by the treating physician or routine age-related reassessment applies.</p> |

17.35 Commercial drivers who have declined an ICD or have an ICD implanted as primary prophylaxis

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who:</p> <ul style="list-style-type: none"> • have had an implantable cardioverter defibrillator (ICD) implanted as a primary prophylaxis, or • have declined an ICD recommended as primary prophylaxis <p>When implanted as a primary prophylaxis, the ICD is implanted to prevent sudden cardiac death in individuals considered to be at high risk but who have not had an episode of ventricular arrhythmia.</p> <p>Individuals whose ICD also regulates pacing for bradycardia must also meet the guidelines for permanent pacemakers outlined in 1.30.</p> |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request an assessment from a cardiologist. |
| Fitness guidelines | Individuals generally may not drive. However, an ICD may sometimes be implanted in an individual with a low risk of sudden incapacitation. Where this is the case, individuals may drive if an assessment by a cardiologist indicates that the annual risk of sudden incapacitation is 1% or less. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if an assessment by a cardiologist indicates that the annual risk of sudden incapacitation is 1% or less. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |

17.36 Private drivers with inherited heart disease

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers with the following inherited heart diseases:</p> <ul style="list-style-type: none"> • Brugada's Syndrome • Long QT Syndrome, and • arrhythmogenic right ventricular cardiomyopathy. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • their condition has been investigated and treated by a cardiologist, and • it has been at least 6 months since they have experienced any event causing an impaired level of consciousness |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their condition has been investigated and treated by a cardiologist, and • it has been at least 6 months since they have experienced any event causing an impaired level of consciousness |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually or more frequently as recommended by the driver's cardiologist. |

17.37 Commercial drivers with inherited heart disease

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| Application | These guidelines apply to driver fitness determinations for commercial drivers with the following inherited heart diseases: <ul style="list-style-type: none">• Brugada's Syndrome• Long QT Syndrome, and• arrhythmogenic right ventricular cardiomyopathy. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request an assessment from a cardiologist. |
| Fitness guidelines | Individuals generally may not drive. However, inherited heart diseases may sometimes pose a very low risk of sudden incapacitation. Where this is the case, individuals may drive if a medical assessment indicates that the annual risk of sudden incapacitation is 1% or less. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if an assessment by a cardiologist indicates that the annual risk of sudden incapacitation is 1% or less. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |

17.38 Private drivers with medically treated valvular heart disease

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers with medically treated:</p> <ul style="list-style-type: none"> • aortic stenosis • aortic regurgitation • mitral stenosis, or • mitral regurgitation. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I or II, and • they have had no episodes of impaired level of consciousness |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I or II, and • they have had no episodes of impaired level of consciousness |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine age-related reassessment applies. |

17.39 Commercial drivers with medically treated aortic stenosis or sclerosis

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers with medically treated:</p> <ul style="list-style-type: none"> • aortic stenosis, or • aortic sclerosis |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I • their condition is asymptomatic • they have an aortic valve area (AVA) $> 1.0 \text{ cm}^2$ • they have a left ventricle ejection fraction (LVEF) $\geq 35\%$ • they have had a detailed assessment by a cardiologist, including an assessment for risk of syncope, and • they have an annual reassessment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I • their condition is asymptomatic • they have an aortic valve area (AVA) $> 1.0 \text{ cm}^2$ • they have a left ventricle ejection fraction (LVEF) $\geq 35\%$ • they have had a detailed assessment by a cardiologist, including an assessment for risk of syncope, and • they have an annual reassessment. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. |

17.40 Commercial drivers with medically treated aortic or mitral regurgitation or mitral stenosis

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| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers with medically treated:</p> <ul style="list-style-type: none"> • aortic regurgitation • mitral stenosis, or • mitral regurgitation. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I • they have an left ventricle ejection fraction (LVEF) $\geq 35\%$, and • they have had no episodes of impaired level of consciousness. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I • they have an left ventricle ejection fraction (LVEF) $\geq 35\%$, and • they have had no episodes of impaired level of consciousness. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment. |

17.41 Private drivers with surgically treated valvular heart disease

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers with:</p> <ul style="list-style-type: none"> • mechanical prostheses • mitral bioprostheses with non-sinus rhythm • mitral valve repair with non-sinus rhythm • aortic bioprostheses • mitral bioprostheses with sinus rhythm, or • mitral valve repair with sinus rhythm. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 weeks since their discharge following treatment • they have no thromboembolic complications, and • for individuals with mechanical prostheses, mitral bioprostheses with non-sinus rhythm or mitral valve repair with non-sinus rhythm, they are on anti-coagulant therapy. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 weeks since their discharge following treatment • they have no thromboembolic complications, and • for individuals with mechanical prostheses, mitral bioprostheses with non-sinus rhythm or mitral valve repair with non-sinus rhythm, they are on anti-coagulant therapy. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every five years, unless routine age-related reassessment applies. |

17.42 Commercial drivers with surgically treated valvular heart disease

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| Application | <p>These guidelines apply to driver fitness determinations for private drivers with:</p> <ul style="list-style-type: none"> • mechanical prostheses • mitral bioprostheses with non-sinus rhythm • mitral valve repair with non-sinus rhythm • aortic bioprostheses • mitral bioprostheses with sinus rhythm, or • mitral valve repair with sinus rhythm. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since their discharge following treatment • they have no thromboembolic complications • they are assessed as NYHA Class I • they have an LVEF $\geq 35\%$, and • for individuals with mechanical prostheses, mitral bioprostheses with non-sinus rhythm or mitral valve repair with non-sinus rhythm, they are on anti-coagulant therapy. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since their discharge following treatment • they have no thromboembolic complications • they are assessed as NYHA Class I • they have an LVEF $\geq 35\%$, and • for individuals with mechanical prostheses, mitral bioprostheses with non-sinus rhythm or mitral valve repair with non-sinus rhythm, they are on anti-coagulant therapy. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment. |

17.43 Private drivers with mitral valve prolapse

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| Application | These guidelines apply to driver fitness determinations for private drivers with mitral valve prolapse. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report, or• additional information from the treating physician. |
| Fitness guidelines | No restrictions. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the condition is longstanding and asymptomatic, no reassessment is required. Otherwise, the OSMV will reassess every 5 years, unless routine age-related reassessment applies. |

17.44 Commercial drivers with mitral valve prolapse

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| Application | These guidelines apply to driver fitness determinations for commercial drivers with mitral valve prolapse. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report• additional information from the treating physician, or• an assessment from a cardiologist. |
| Fitness guidelines | Individuals may drive if they are asymptomatic. Individuals who are symptomatic may drive if: <ul style="list-style-type: none">• they have been assessed for arrhythmia with a Holter, and• they meet any applicable guidelines related to arrhythmias. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none">• they are asymptomatic, or• where they are symptomatic they have been assessed for arrhythmia with a Holter, and they meet any applicable guidelines related to arrhythmias. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment. |

17.45 Private drivers with congestive heart failure

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| Application | These guidelines apply to driver fitness determinations for private drivers with congestive heart failure. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> <p>If the treating physician indicates concerns regarding a lack of stamina or general debility, the OSMV will request an ICBC road test.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II, or III • they are not receiving intermittent inotropes • they are not using a left ventricle assist device, and • they have sufficient cognitive function to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II, or III • they are not receiving intermittent inotropes • they are not using a left ventricle assist device, and • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving or, where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, the OSMV will reassess every 5 years or in accordance with routine age-related reassessment, unless more frequent reassessment is recommended by the treating physician. |

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| Policy rationale | In addition to the CCS recommendations for congenital heart failure, which address the risk of episodic impairment, these guidelines include additional requirements to address potential persistent impairments associated with the condition. |
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17.46 Commercial drivers with congestive heart failure

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| Application | These guidelines apply to driver fitness determinations for commercial drivers with congestive heart failure. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> <p>If the treating physician indicates concerns regarding a lack of stamina or general debility, the OSMV will request an ICBC road test.</p> |
| Fitness guidelines | <p>Individuals may be found fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, or II • they have an LVEF $\geq 35\%$ • they are not receiving intermittent inotropes • they are not using a left ventricle assist device, and • they have sufficient cognitive function to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, or II • they have an LVEF $\geq 35\%$ • they are not receiving intermittent inotropes • they are not using a left ventricle assist device, and • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving or, where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the treating physician or cognitive screening indicates possible cognitive impairment, the OSMV will reassess annually. Otherwise, |

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| | the OSMV will reassess in accordance with routine commercial reassessment, unless more frequent reassessment is recommended by the treating physician. |
| Policy rationale | In addition to the CCS recommendations for congenital heart failure, which address the risk of episodic impairment, these guidelines include additional requirements to address potential persistent impairments associated with the condition. |

17.47 Private drivers with left ventricular dysfunction or cardiomyopathy

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| Application | These guidelines apply to driver fitness determinations for private drivers with left ventricular dysfunction or cardiomyopathy. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II, or III • they are not receiving intermittent inotropes, and • they are not using a left ventricle assist device. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II, or III • they are not receiving intermittent inotropes, and • they are not using a left ventricle assist device. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every 5 years or in accordance with routine age-related reassessment, unless more frequent reassessment is recommended by the treating physician. |

17.48 Commercial drivers with left ventricular dysfunction or cardiomyopathy

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| Application | These guidelines apply to driver fitness determinations for commercial drivers with left ventricular dysfunction or cardiomyopathy. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, or II • they have an LVEF $\geq 35\%$ • they are not receiving intermittent inotropes, and • they are not using a left ventricle assist device. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I, or II • they have an LVEF $\geq 35\%$ • they are not receiving intermittent inotropes, and • they are not using a left ventricle assist device. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment, unless more frequent reassessment is recommended by the treating physician. |

17.49 Private drivers with a heart transplant

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| Application | These guidelines apply to driver fitness determinations for private drivers who have had a heart transplant. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 weeks since their discharge following transplant • they are assessed as NYHA Class I or II • they are on stable immunotherapy, and • they have an annual reassessment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 weeks since their discharge following transplant • they are assessed as NYHA Class I or II • they are on stable immunotherapy, and • they have an annual reassessment. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every 5 years if the individual's condition is controlled, stable and asymptomatic. Otherwise, the OSMV will reassess as recommended by the treating physician. |

17.50 Commercial drivers with a heart transplant

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| Application | These guidelines apply to driver fitness determinations for commercial drivers who have had a heart transplant. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 months since their discharge following transplant • they are assessed as NYHA Class I • they have an LVEF > 35% • they are on stable immunotherapy, and • they have an annual reassessment, which includes a non-invasive test of ischemic burden showing no evidence of active ischemia. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 months since their discharge following transplant • they are assessed as NYHA Class I • they have an LVEF > 35% • they are on stable immunotherapy, and • they have an annual reassessment, which includes a non-invasive test of ischemic burden showing no evidence of active ischemia |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with routine commercial reassessment, unless more frequent reassessment is recommended by the treating physician. |

17.51 Private drivers with hypertrophic cardiomyopathy

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| Application | These guidelines apply to driver fitness determinations for private drivers who have hypertrophic cardiomyopathy. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report• additional information from the treating physician, or• an assessment from a cardiologist. |
| Fitness guidelines | Individuals may drive if they have had no episodes of impaired level of consciousness |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none">• they have had no episodes of impaired level of consciousness |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually until the condition is controlled and stable and then every five years, unless routine age-related reassessment applies. |

17.52 Commercial drivers with hypertrophic cardiomyopathy

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| Application | These guidelines apply to driver fitness determinations for commercial drivers who have hypertrophic cardiomyopathy. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a cardiologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have had no episodes of impaired level of consciousness • they have no family history of sudden death at a young age • they have left ventricle wall thickness of < 30 mm • they show no increase in blood pressure with exercise, and • they have an annual Holter showing no nonsustained VT. |
| OSMV determination guidelines | <p>The OSMV may individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have had no episodes of impaired level of consciousness • they have no family history of sudden death at a young age • they have left ventricle wall thickness of < 30 mm • they show no increase in blood pressure with exercise, and • they have an annual Holter showing no nonsustained VT, |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually until the condition is controlled and stable and then in accordance with routine commercial reassessment. |

17.53 Syncope

See the guidelines in Chapter 22, Syncope.

17.54 Private and commercial drivers with hypertension

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have hypertension. |
| Assessment guidelines | If further information regarding an individual's medical condition is required, the OSMV will request: <ul style="list-style-type: none">• a Driver's Medical Examination Report, or• additional information from the treating physician |
| Fitness guidelines | Individuals with a sustained blood pressure of less than 170/110 mmHg may drive. Individuals with persistent blood pressure of 170/110 mmHg or higher may drive if they have no co-morbid conditions that impair their functional ability to drive. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none">• They have a sustained blood pressure of less than 170/110 mmHg• Individuals with persistent blood pressure of 170/110 mmHg or higher may drive if they have no co-morbid conditions that impair their functional ability to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment is required, other than routine commercial or age-related reassessment, if the condition is stable and the individual is asymptomatic and compliant with treatment. Otherwise, the OSMV will reassess as recommended by the treating physician. |
| Policy rationale | Hypertension is not specifically addressed in the CCS recommendations. Drivers who have significant hypertension are at risk for developing co-morbid conditions that may affect fitness to drive, including damage to the heart, eyes, kidneys, and brain. |

17.55 CCS recommendations regarding transient conditions

Waiting periods

The waiting periods in these recommendations refer to the time interval following onset of the referenced cardiac condition or event during which it is recommended that an individual does not drive. These recommendations are intended to mitigate the risk of an episodic impairment of functional ability to drive.

- Recurrence of the referenced cardiac condition or event during a waiting period resets the waiting period.
- If more than one waiting period applies (because of multiple conditions/events) the longer waiting period should be applied, unless otherwise stated.

A. Coronary artery disease

Acute coronary syndromes – waiting periods

| | Private | Commercial |
|--|---|--|
| ST elevation MI | <ul style="list-style-type: none"> • 1 month after discharge | <ul style="list-style-type: none"> • 3 months after discharge |
| Non-ST elevation MI with significant LV damage | | |
| Non-ST elevation MI with minor LV damage | | |
| If PCI performed during initial hospital stay | <ul style="list-style-type: none"> • 48 hours after PCI | <ul style="list-style-type: none"> • 7 days after PCI |
| If PCI not performed during initial hospital stay | <ul style="list-style-type: none"> • 7 days after discharge | <ul style="list-style-type: none"> • 30 days after discharge |
| Acute coronary syndrome without MI (unstable angina) | | |
| If PCI performed during initial hospital stay | <ul style="list-style-type: none"> • 48 hours after PCI | <ul style="list-style-type: none"> • 7 days after PCI |
| If PCI not performed during initial hospital stay | <ul style="list-style-type: none"> • 7 days after discharge | <ul style="list-style-type: none"> • 30 days after discharge |

Notes:

ST elevation: refers to the appearance of the ST segment of an electrocardiogram (ECG or EKG)

MI: Myocardial infarction (heart attack)

LV: left ventricle

Significant LV damage: any MI which is not classified as minor

Minor LV damage: an MI defined only by elevated troponin \pm ECG changes and in the absence of a new wall motion abnormality.

Stable coronary syndromes – waiting periods

| | Private | Commercial |
|---|--|--|
| Stable angina | <ul style="list-style-type: none"> No restrictions | |
| Asymptomatic coronary artery disease | | |
| PCI | <ul style="list-style-type: none"> 48 hours after PCI | <ul style="list-style-type: none"> 7 days after PCI |
| Notes: <u>PCI</u> : Percutaneous coronary intervention (angioplasty) | | |

Cardiac surgery for coronary artery disease – waiting periods

| | Private | Commercial |
|------------------------------|---|--|
| Coronary artery bypass graft | <ul style="list-style-type: none"> 1 month after discharge | <ul style="list-style-type: none"> 3 months after discharge |

B. Disturbances of cardiac rhythm, arrhythmia devices and procedures

Catheter ablation and EPS

| | Private | Commercial |
|--|--|--|
| Catheter ablation procedure EPS with no inducible sustained ventricular arrhythmias | <ul style="list-style-type: none"> 48 hours after discharge | <ul style="list-style-type: none"> 1 week after discharge |
| Notes: <u>EPS</u> : electrophysiology | | |

C. Disturbances of cardiac rhythm and arrhythmia devices

Ventricular arrhythmias

| | Private | Commercial |
|---|--|------------|
| VF with a reversible cause | No driving until/unless successful treatment of underlying condition | |
| Notes: <u>VF</u> : ventricular fibrillation Examples of reversible causes of VF: <ul style="list-style-type: none">• VF within 24 hours of myocardial infarction• VF during coronary angiography• VF with electrocution• VF secondary to drug toxicity | | |

Chapter 18: Hearing Loss

BACKGROUND

18.1 About hearing loss

Hearing loss is categorized as either conductive or sensorineural. Conductive hearing loss involves abnormalities in the external or middle ear, including the ear canal, eardrum or ossicles. A blockage or other structural problem interferes with how sound gets conducted through the ear, making sound levels seem lower. In many cases, conductive hearing loss can be corrected with medication or surgery.

Sensorineural hearing loss typically results from permanent damage to the inner ear (cochlea) or the auditory nerve. Typically, it is gradual, bilateral, and characterized by the loss of high-frequency hearing. Sensorineural hearing loss is permanent and often is helped with hearing aids. Profound deafness can be treated with cochlear implants.

Sensorineural hearing loss accounts for 90% of all hearing loss.

18.2 Prevalence and incidence of hearing loss

The 2003 Canadian Community Health Survey (CCHS) indicated that 3% of Canadians 12 years of age and older have some type of hearing difficulty. The prevalence of hearing loss increases with age. In the CCHS, 5% of 65 to 69 year-olds reported hearing problems, with the percentage increasing to 23% of those 80 and older. Hearing loss is more common in men than in women across every age group.

18.3 Hearing loss and adverse driving outcomes

The effects of hearing loss on the ability to safely operate a motor vehicle are not well established. Although the overall body of literature examining the relationship between hearing loss and driving is small, since the 1990's there has been an increasing amount of research in this area. The results are equivocal. Some studies report an association between impairments in hearing and adverse driving outcomes while others have not found an association.

Although variability in methodology makes it difficult to draw conclusions across studies, results from studies indicate that, for the majority (70%) of study measures, no significant relationship was found between hearing loss and adverse driving outcomes (e.g. crashes, violations, convictions).

18.4 Effect of hearing loss on functional ability to drive

The effect of hearing loss on functional ability to drive has not been established. However, ensuring that the horn works, listening for unusual engine sounds and listening for leaks in the air brake system are parts of the standard pre-trip vehicle inspection routine that commercial drivers must complete before each trip.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--------------|--|-------------------------------------|--|
| Hearing loss | Persistent Impairment: Functional assessment | Sensory - Hearing | Driver's Medical Examination Report Hearing report (see sample form in 18.8) ICBC pre-trip inspection test |

18.5 Compensation

Drivers with hearing loss may compensate for this impairment when conducting pre-trip inspections by utilizing alternative inspection techniques, such as putting water on the air brake line to see if bubbles form due to an air leak.

GUIDELINES

18.6 Private drivers with hearing loss

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers with hearing loss. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | No hearing requirements. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine age-related reassessment, is required. |
| Policy rationale | There is insufficient evidence to support a minimum hearing requirement for private drivers. |

18.7 Commercial drivers with hearing loss

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who are required to conduct a pre-trip vehicle inspection under s.37.22 of the Motor Vehicle Act Regulation. |
| Assessment guidelines | <p>If the treating physician indicates a change in hearing ability in a licensed commercial driver who previously met the hearing standard outlined below, the OSMV will request an audiometric assessment conducted by an:</p> <ul style="list-style-type: none"> • otolaryngologist • audiologist, or • hearing clinic operated by BC Ministry of Health. <p>If the audiometric assessment indicates that an individual does not meet the hearing standard, the OSMV will request an ICBC pre-trip inspection test.</p> |
| Fitness guidelines | <p>No hearing requirements on initial application for licence</p> <p>After initial licensing, individuals who develop corrected or uncorrected hearing loss greater than 40 dB averaged at 500, 1000, and 2000 Hz in their better ear may drive if they successfully complete a pre-trip inspection test demonstrating that they are able to compensate for their hearing loss.</p> |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their corrected or uncorrected hearing loss is not greater than 40 dB averaged at 500, 1000, and 2000 Hz in their better ear, or • if their corrected or uncorrected hearing loss is greater than 40 dB averaged at 500, 1000, and 2000 Hz in their better ear, they successfully complete a pre-trip inspection test demonstrating that they are able to compensate for their hearing loss. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will place the following restriction on an individual's licence if the individual must wear a hearing aid in order to meet the hearing standard outlined above:</p> <p>23 Must wear hearing aid</p> <p>The OSMV will place the following restriction on an individual's licence if the individual does not meet the hearing standard outlined above:</p> <p>51 Visible low air warning device</p> |
| Reassessment guidelines | No reassessment, other than routine commercial reassessment, is required. |

| | |
|--------------------------------|---|
| <p>Policy rationale</p> | <p>There is insufficient evidence to support a minimum hearing requirement for commercial drivers in relation to operating a vehicle on the road. However, some elements of the standard pre-trip inspection for commercial vehicles involve listening. Commercial drivers are required by law to regularly conduct a pre-trip inspection prior to driving.</p> <p>Drivers with hearing loss must be able to adequately compensate for their hearing loss when completing a required pre-trip inspection.</p> <p>Drivers who have hearing loss at the time they obtain their commercial licence will demonstrate their ability to compensate on the pre-trip inspection test prior to licensing, and no further assessment is required.</p> <p>Drivers who experience hearing loss after obtaining their commercial licence must re-take the pre-trip inspection test to demonstrate that they are able to compensate for hearing loss that developed after their pre-licensing test.</p> |
|--------------------------------|---|

18.8 Hearing report



Office of the Superintendent
of Motor Vehicles
www.pssg.gov.bc.ca/osmv

PO BOX 9254 STN
PROV GOVT
VICTORIA BC V8W 9J2
Phone: (250) 387-7747
Fax: (250) 952-6888

HEARING REPORT

Note to Driver: If you have had a hearing test done within one year prior to the date this form was issued, you may submit the results of that test. If you require a current hearing test to fulfill this requirement, OSMV will pay the service provider directly

The personal information on this form is collected under the authority of the *Motor Vehicle Act* and the *Freedom of Information and Protection of Privacy Act*. The information provided will be used to determine your fitness to drive a motor vehicle. Personal information is protected from unauthorized use and disclosure in accordance with the *Freedom of Information and Protection of Privacy Act* and may be disclosed only as provided by that Act. If you have any questions about the collection, use and disclosure of the information collected, contact the Office of the Superintendent of Motor Vehicles at (250) 387-7747.

THIS REPORT MUST BE COMPLETED IN FULL AND RETURNED WITHIN 30 DAYS TO THE OFFICE OF THE SUPERINTENDENT OF MOTOR VEHICLES

| Driver's Name | DL # | Date Issued |
|---------------|------|-------------|
|---------------|------|-------------|

RECENT UNAIDED AUDIOGRAM

| | | FREQUENCY IN HERTZ (Hz) | | |
|----------------------------|-----------|-------------------------|------|------|
| | | 500 | 1000 | 2000 |
| Intensity in Decibels (db) | RIGHT EAR | | | |
| | LEFT EAR | | | |

If hearing loss is greater than 40 db in the better ear, complete the following:

RECENT AIDED AUDIOGRAM

| | | FREQUENCY IN HERTZ (Hz) | | |
|----------------------------|-----------|-------------------------|------|------|
| | | 500 | 1000 | 2000 |
| Intensity in Decibels (db) | RIGHT EAR | | | |
| | LEFT EAR | | | |

YES NO

1. Is hearing loss progressive?
2. Can hearing be corrected with an aid?
3. Was an aid prescribed?

| | |
|--|--|
| | |
| | |
| | |

| | | | |
|---|------|--|--------|
| EXAMINING AUDIOLOGIST NAME AND ADDRESS (USE RUBBER STAMP OR PRINT) | | RECOMMENDATIONS - FOR OFFICE USE ONLY | |
| TELEPHONE NUMBER: | | <input type="radio"/> DOES NOT MEET GUIDELINES <input type="radio"/> MEETS GUIDELINES – NO RESTRICTION <input type="radio"/> MEETS GUIDELINES – WITH RESTRICTIONS <input type="radio"/> RESTRICTIONS ADDED <input type="radio"/> 23 <input type="radio"/> 37 <input type="radio"/> 51 | |
| SIGNATURE OF AUDIOLOGIST OF EXAM | DATE | NAME (PLEASE PRINT) | OFFICE |
| _____ (YYYY/MM/DD) | | _____ (YYYY/MM/DD) | |

Chapter 19: Psychiatric Disorders

BACKGROUND

19.1 About psychiatric disorders

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)⁷, published by the American Psychiatric Association, contains a standard classification system of psychiatric disorders for health care professionals in the United States and Canada. It classifies psychiatric disorders by diagnostic category, based on five axes. The five axes, along with a summary of the diagnostic category for each, and some common disorders falling within each axis are provided in the table below.

Psychiatric Disorders: Axes, Diagnostic Categories and Common Disorders
(DSM-IV-TR, American Psychiatric Association, 2000)

| Axis | Diagnostic Category | Examples |
|-----------|---|---|
| Axis I: | Clinical disorders, including major mental disorders, as well as developmental and learning disorders | <ul style="list-style-type: none">• Delirium, dementia, and other cognitive disorders• Substance related disorders• Mood disorders (major depressive disorder, bipolar disorders, dysthymia)• Anxiety disorders• Attention-Deficit/Hyperactivity Disorder• Schizophrenia |
| Axis II: | Personality disorders, as well as mental retardation | <ul style="list-style-type: none">• Personality disorders<ul style="list-style-type: none">○ Borderline Personality Disorder○ Schizotypal Personality Disorder○ Anti-social Personality Disorder○ Narcissistic Personality Disorder |
| Axis III: | Acute medical conditions and physical disorders | <ul style="list-style-type: none">• Diseases of the nervous, circulatory, musculoskeletal, etc. systems |
| Axis IV: | Psychosocial and environmental factors contributing to the disorder | <ul style="list-style-type: none">• Relationship, social, educational, occupational, housing or financial problems may precipitate or aggravate a mental disorder |
| Axis V: | Global assessment of Functioning | <ul style="list-style-type: none">• A rating scale, from 0 to 100, used to report on impairment due to psychiatric disorder |

This chapter is concerned with Axis I and Axis II disorders. Axis III focuses on general medical conditions. Those conditions with relevance to driving safety are addressed in other chapters of

⁷ The most recent addition is the DSM-IV-TR, published in 2000. Publication of the DSM-V is expected in 2012.

this manual. Axis IV addresses external factors that may impact an individual's physical or psychological health and are not addressed in this manual. Axis V, the Global Assessment of Functioning, is a 0 to 100 scale used for reporting a clinician's judgment of an individual's level of psychological, social and occupational functioning in light of any impairment due to psychiatric disorders. A low score is a red flag for potential impairment of functions necessary for driving.

Delirium, dementia, and other cognitive disorders (Axis I)

The effects of delirium, dementia, and other cognitive disorders on driving are covered in Chapter 27 of this Manual, Cognitive Impairment including Dementia.

Substance-use disorders (Axis I)

Substance-use disorders refer to the taking of a drug of abuse (including alcohol). Substances include alcohol, amphetamines, cannabis, cocaine, hallucinogens, sedatives, hypnotics, and anxiolytics. The effects of drugs commonly prescribed for medical conditions are addressed in Chapter 29, Psychotropic Drugs

Mood disorders - Major Depressive Disorder, Bipolar Disorder, Dysthymia (Axis I)

Major Depressive Disorder (single episode or recurrent), Bipolar Disorders (Manic, Depressed, or Mixed types), and Dysthymic Disorder are collectively referred to as mood disorders.

Major Depressive Disorder is characterized by one or more episodes of depressed mood or loss of interest in usual activities, as well as four additional symptoms of depression, with the episodes lasting for two or more weeks. Additional symptoms of depression include:

- change in appetite
- sleep disturbances
- decreased energy or fatigue
- sense of worthlessness or guilt, and
- poor concentration or difficulty making decisions.

Bipolar Disorder is characterized by one or more manic or mixed (manic and depression) episodes, with or without a history of major depression.

Dysthymic Disorder is defined as a chronically depressed mood over a period of at least two years.

Anxiety disorders (Axis I)

There are a number of anxiety disorders classified in the DSM-IV-TR, including:

- Generalized Anxiety Disorder
- specific phobias
- Posttraumatic Stress Disorder
- Social Phobia
- Obsessive Compulsive Disorder, and
- Panic Disorder.

Symptoms include intense and prolonged feelings of fear or distress that occur out of proportion to the actual threat or danger. The feelings of distress also must be sufficient to interfere with normal daily functioning.

Attention-Deficit/Hyperactivity Disorder (Axis I)

Attention-Deficit/Hyperactivity Disorder (ADHD) is characterized by inappropriate degrees of inattention, impulsivity, and overactivity that begin in childhood. ADHD is one of the most common neurobehavioral disorders of childhood and can persist through adolescence and into adulthood.

Although many individuals with ADHD show symptoms of both inattention and hyperactivity-impulsivity, there may be a predominance of either inattention or hyperactivity-impulsivity. This variability of presentation is reflected in the three major classifications of the disorder:

- Combined Type (exhibiting both inattention and hyperactivity-impulsivity)
- Predominately Inattentive Type, and
- Predominately Hyperactivity-Impulsivity Type.

The symptoms of hyperactivity and impulsivity tend to diminish over time so that many adults will present with primary symptoms of inattention only.

Schizophrenia (Axis I)

The effects of Schizophrenia on the individual can be profound. Common symptoms include delusions and hallucinations, thought disorders, lack of motivation, and social withdrawal. The symptoms of Schizophrenia are generally divided into three broad categories⁸:

- Positive or “psychotic” symptoms are characterized by abnormal thoughts or behaviours. For example, hallucinations are disturbances of perception where individuals hear or see things that are not there.
- Disorganised symptoms are characterized by poorly organized, illogical or bizarre thought processes. These disturbances in logical thought processes frequently produce observable patterns of behaviour that are also disorganized and bizarre.

⁸ Monash Report 213, April 2004, pg. 272-73

- Negative symptoms are characterized by the absence of thoughts and behaviours that would otherwise be expected. This may be manifested as limited ability to think abstractly, to express emotion, to initiate activities, or to become motivated.

The onset of Schizophrenia can occur at any age, but most typically appears in early adulthood.

Many individuals with Schizophrenia have recurring acute psychotic attacks (consisting of positive and/or disorganized symptoms) throughout their life, which are typically separated by intervening periods in which they usually experience residual or negative symptoms. It is now recognized that early intervention (promptly at the time of the first psychotic break) is very important in preventing major cognitive impairment resulting from this condition.

Personality disorders (Axis II)

There are a number of personality disorders identified in the DSM-IV-TR, including:

- Borderline Personality Disorder
- Schizotypal Personality Disorder
- Anti-Social Personality Disorder, and
- Narcissistic Personality Disorder.

Onset typically occurs during adolescence or in early adulthood. The disorder affects thought, emotion, interpersonal relationships, and impulse control. Symptoms include difficulty getting along with people and the presence of consistent behaviours that deviate markedly from societal expectations. The prognosis depends on whether the person has an awareness and acceptance of the disorder and its manifestations, and is willing to engage in treatment.

Mental retardation (Axis II)

The DSM-IV-TR defines Mental Retardation as significantly subaverage intellectual functioning (an IQ of 70 or below), with onset before the age of 18 years, and concurrent deficits or impairments in adaptive functioning.

Suicidal ideation

Suicidal ideation is defined as having thoughts of suicide or taking action to end one's own life, irrespective of whether the thoughts include a plan to commit suicide. Studies indicate that more than 90% of all suicides are associated with psychiatric disorders.

Insight

For individuals with psychiatric disorders, insight is an important factor in their ability to adhere to treatment and respond appropriately to their condition. In general, individuals with sufficient insight are those who are aware of any cognitive limitations caused by their disorder and who have the judgment and willingness to adapt their driving to these limitations.

Affect

Emotional control – the ability to manage frustration, agitation, impulsivity – is an important functional component of safe driving performance. Affect includes:

- emotional intelligence
- impulse control / emotional control
- frustration threshold
- agitation, and
- impulsivity and / or mood control / management.

In this Manual, affect will be considered as one of the functional abilities needed for driving for individuals with psychiatric disorders.

Psychomotor

Psychomotor functions affect the coordination of cognitive processes and motor activity. In this Manual, psychomotor function will be considered as one of the functional abilities needed for driving for individuals with psychiatric disorders.

19.2 Prevalence and incidence of psychiatric disorders

Mood disorders - Major Depressive Disorder, Bipolar Disorder, Dysthymic Disorder (Axis I)

In Canada, approximately 8% of adults will experience major depression at some time in their lives, with approximately 1% experiencing Bipolar Disorder. Depression is more common among women, with a female to male ratio of 2 to 1. Women also are 2 to 3 times more likely to develop Dysthymic Disorder. For bipolar disorder, the ratio between males and females is approximately equal.

Anxiety disorders (Axis I)

Anxiety disorders affect 12% of the Canadian population, and result in mild to severe impairment. The prevalence in the Canadian population is higher for Specific Phobia (6.2-8.0%) and Social Phobia (6.7%) compared to Obsessive Compulsive Disorder (1.8%), Generalized Anxiety Disorder (1.1%), and Panic Disorder (0.7%). The prevalence of Posttraumatic Stress Disorder in the United States is estimated to be 8 to 9%.

Attention-Deficit/Hyperactivity Disorder (Axis I)

Prevalence rates of ADHD vary, depending on the diagnostic criteria used, the setting (e.g. general population vs. clinic sample), and the reporter (e.g. parent, teacher, self). Estimates suggest that ADHD affects 3% to 10% of school age children and is 2 to 3 times more common in boys. It is estimated that 33% to 67% of those with ADHD continue to manifest symptoms into adulthood, and that 5% to 7% of the adult population has ADHD.

Schizophrenia (Axis I)

Schizophrenia affects 1% of the population, with onset typically in early adulthood (late teens to mid-30s). Males and females are affected equally.

Personality disorders (Axis II)

In the United States, the prevalence of personality disorders is estimated to be between 6 and 9%.

Suicidal ideation

In the general population of Canada, the estimated prevalence of suicidal ideation is from 5 to 18%. The incidence of suicide attempts in the general population is from 1 to 5%.

19.3 Psychiatric disorders and adverse driving outcomes

Despite the prevalence of psychiatric disorders in the general population, there have been few investigations into the relationship between these disorders and adverse driving outcomes. Surprisingly, the majority of research was done, on average, more than 30 years ago.

There are a number of methodological issues that impact the ability to draw conclusions from the existing research, in particular, the impact of improved treatment of psychiatric disorders and changes in the complexity of the driving environment on the results of older studies. Nonetheless, the consistency of findings supports a general conclusion that drivers with psychiatric conditions are at increased risk of adverse driving outcomes.

Mood disorders - Major Depressive Disorder, Bipolar Disorder, Dysthymic Disorder

A few studies have identified depression as one of a number of factors that may influence driving performance. However, the results of these studies are equivocal, and methodological limitations significantly limit any conclusions that may be drawn.

Pharmacological treatment of mood disorders is an important consideration. When treatment is effective, the alertness, cognitive ability and judgment of a person with a mood disorder may be improved. At the same time, the significant side effects of anti-depressant medications may include impairments in psychomotor functioning, sedation, and impairments in cognitive functioning. The impact of the side effects of drug treatment on driving is considered in Chapter 29, Psychotropic Drugs.

Anxiety disorders

There are no studies that have investigated the relationship between anxiety disorders and driving. Pharmacological treatment with sedatives or hypnotics may include side effects that impair functional ability to drive. See Chapter 29, Psychotropic Drugs, for more information.

Attention-Deficit/Hyperactivity Disorder (Axis I)

There is a small body of research that suggests that drivers with ADHD are at a higher risk for crashes, have higher rates of traffic citations, licence revocations or suspensions, and are more likely to drive without a licence.

There is some indication that pharmacological treatment of ADHD with stimulants may have a positive effect on driving performance. However, research in this area has primarily relied on driving simulators to measure outcomes. A few studies have investigated the relationship between pharmacological treatment of ADHD and on-road performance. However, methodological limitations, including small sample size (< 20 in all cases), limit the findings. The effects of pharmacological treatment of ADHD are discussed further in Chapter 29, Psychotropic Drugs.

Schizophrenia

The results of the few studies on the relationship between Schizophrenia and adverse driving outcomes are equivocal. Given the functional impairments often associated with this disorder, the results are surprising. An important factor which may contribute to the equivocal results is driver licensing rates. A recent study found that only 52% of individuals with Schizophrenia were licensed to drive compared to 96% in the control group. Failure to control for the reduced driving exposure of individuals with Schizophrenia is an important consideration in that crash rates are likely an underestimation of impairments in driving performance in this population.

Personality disorders

Two studies, both more than 30 years old, considered the relationship between personality disorders and adverse driving outcomes. Both studies found an increased crash risk for individuals with personality disorders.

Suicidal ideation

Studies on the incidence of traffic suicides indicate that suicide attempts play a significant role in motor vehicle crashes. Moreover, it is likely that the reported incidence rates of traffic suicides are an underestimation, due to the methodological difficulties in classifying a traffic death as suicide.

Research indicates the following risk factors for traffic suicides:

- males are significantly more at risk (90 to 95%) than females
- whites are more at risk than other racial groups
- those who are “depressed” or “mentally disturbed” are more at risk than those who are not, and
- those with a history of attempted suicide or a family history of suicide are more at risk than those without such history.

19.4 Effect of psychiatric disorders on functional ability to drive

Psychiatric disorders can result in either a persistent or episodic impairment of the functions necessary for driving.

The role of insight

An individual's level of insight is a critical consideration when assessing the risk of an episodic impairment of functional ability due to a psychiatric disorder.

Individuals with good insight are more likely to be diligent about their treatment regime and to seek medical attention and avoid driving when experiencing acute episodes. Poor insight may be evidenced by non-compliance with treatment, trivializing the individual's role in a crash or repeated involuntary admissions to hospital, often as a result of discontinuing prescribed medication.⁹

Mood disorders - Major Depressive Disorder, Bipolar Disorder, Dysthymia (Axis I)

Cognitive abilities that may be affected by mood disorders include:

- attention and concentration
- memory
- information processing
- reaction time, and
- psychomotor functioning.

Anxiety disorders (Axis I)

The research on the effects of anxiety disorders on functional ability is limited. Findings from studies examining the effects of anxiety disorders on cognitive functioning are equivocal. Neurobiological studies suggest that medial and temporal lobe structures are affected in anxiety disorders. These are structures that are responsible for memory and higher order executive functioning. From a clinical perspective, the potential for diminished attention, or perseverating on errors (including "freezing") in the face of unexpected risks on the road may be of concern for driving.

⁹ Determining Medical Fitness to Operate Motor Vehicles – CMA Driver's Guide, 7th edition, 2006, pg. 33

Attention-Deficit/Hyperactivity Disorder (Axis I)

The pattern of deficits in adults with ADHD is similar to that in children and adolescents. One of the primary cognitive functions that may be affected is the ability to sustain attention, particularly when performing demanding cognitive tasks. In addition to attentional impairments, individuals with ADHD often experience other cognitive deficits such as difficulties with:

- planning and forethought
- flexibility
- problem solving
- working memory, and
- response inhibition.

Symptoms of ADHD referenced in the DSM-IV-TR that may be relevant to driving include:

Inattention

- often fails to give close attention to details or makes careless mistakes in school work, work, or other activities
- often has difficulty sustaining attention in tasks or play activities
- often is easily distracted by extraneous stimuli.

Hyperactivity-impulsivity

- often is “on the go” or acts as if “driven by a motor”
- often has difficulty awaiting his or her turn.

Schizophrenia (Axis I)

Neuropsychological deficits associated with Schizophrenia may impact driving. The degree of functional impairment associated with schizophrenia varies between the acute and residual phases of the disorder. Neuropsychological functions that may be impaired include:

- attention
- executive function
- spatial abilities
- memory, and
- motor and tactile dexterity.

Personality disorders (Axis II)

The characteristics of personality disorders most likely to affect driving include:

- affectivity (e.g. aggression, frustration, anger)
- interpersonal functioning (e.g. failure to conform to social norms, reckless disregard for the safety of others), and
- poor impulse control.

Suicidal ideation

Suicidal ideation is an important consideration regarding drivers with psychiatric disorders because of the risk of traffic suicide.

Pharmacological treatment

In addition to the direct effects of psychiatric disorders on functional ability to drive, the impact of pharmacological treatment is an important consideration when assessing drivers. The effects of drug treatment are considered in Chapter 29, Psychotropic Drugs.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--|---|-------------------------------------|---|
| Mood disorders Anxiety disorders ADHD Schizophrenia | Persistent Impairment: Functional assessment | Cognitive Psychomotor | Driver's Medical Examination Report Specialist's report ICBC road test SIMARD-MD DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |
| | Episodic impairment: Medical assessment – likelihood of impairment | Cognitive Psychomotor | Driver's Medical Examination Report Specialist's report |
| Personality disorders | Persistent Impairment: Functional assessment | Affective | Driver's Medical Examination Report Specialist's report |
| | Episodic impairment: Medical assessment – likelihood of impairment | Affective | Driver's Medical Examination Report Specialist's report |

19.5 Compensation

Individuals with psychiatric disorders are not able to compensate for their impairments.

GUIDELINES

19.6 Private and commercial drivers with a psychiatric disorder or psychotic episode

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have:</p> <ul style="list-style-type: none"> • a psychiatric disorder, or • a psychotic episode. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician • additional information from the individual's mental health team, or • an assessment from a psychologist or psychiatrist. <p>If the treating physician indicates that the individual may have persistent functional impairment as a result of the condition or its treatment, the OSMV will request functional assessment(s) as appropriate for the type of impairment(s) and class of licence held.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • their condition is stable • they have been assessed as having sufficient insight to stop driving if their condition becomes acute • they are compliant with any prescribed psychotropic medication regime or other recommended treatment, including regular follow-up where required • for commercial drivers who have had a psychotic episode, a specialist is supportive of their return to driving, and • their functional abilities necessary for driving are not impaired |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their condition is stable and controlled • their treating physician does not indicate any concerns with insight • they are compliant with any prescribed psychotropic medication regime or other recommended treatment, including regular follow-up where required • for commercial drivers who have had a psychotic episode, a specialist, or their treating physician if the physician has been treating the driver for more than two years, is supportive of their return to driving, and • where the treating physician indicates possible persistent |

| | |
|--------------------------------|--|
| | functional impairment resulting from the condition or its treatment, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must stop driving and report to the OSMV if you are hospitalized due to a psychotic episode, and • you must remain under regular medical supervision and follow your physician's advice regarding treatment. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>For individuals who have had a psychotic episode, the OSMV will reassess annually until the treating physician indicates there have been no further psychotic episodes.</p> <p>Otherwise, the OSMV will determine the appropriate reassessment interval for individuals with a psychiatric disorder on an individual basis.</p> |
| Policy rationale | Given the nature of psychiatric disorders, assessment of fitness must rely primarily on the clinical judgment of health care professionals involved in treatment. Where the disorder results in a persistent impairment, the impact of that impairment should be functionally assessed. |

Chapter 20: Cerebrovascular Disease

BACKGROUND

20.1 About cerebrovascular disease

Cerebrovascular disease is disease involving the blood vessels supplying the brain.

Transient ischemic attack (TIA)

A transient ischemic attack (TIA) is a brief episode of neurological dysfunction caused by a temporary state of reduced blood flow to the brain. The symptoms of a TIA are similar to a CVA (described below) but are temporary, typically lasting less than one hour and no more than 24 hours. The most common cause of a TIA is a blood clot. A TIA is considered to be a warning sign that a CVA may be imminent. The risk of having a CVA is 10% in the first 90 days following a TIA, with a cumulative 3 year risk of 25%.

Cerebrovascular accident (CVA)

A cerebrovascular accident (CVA) or stroke is defined as rapidly developing clinical signs of focal or global disturbance of cerebral function, with symptoms lasting 24 hours or longer, or leading to death, with no apparent cause other than of vascular origin. A CVA can be classified as either ischemic or hemorrhagic. Ischemic CVA refers to a CVA caused by thrombosis or embolism, and accounts for 85% of all CVAs. Hemorrhagic CVAs are caused by an intracerebral hemorrhage (bleeding within the brain) or subarachnoid hemorrhage (bleeding between the inner and outer layers of the tissue covering the brain).

The symptoms of a CVA vary depending on what part of the brain is affected. The most common symptom is weakness or paralysis of one side of the body with partial or complete loss of voluntary movement or sensation in a leg or arm. There can be speech problems and weak face muscles. Numbness or tingling is very common. A CVA can affect:

- balance
- vision
- swallowing
- breathing, and
- level of consciousness.

Visual or spatial neglect is a common consequence of a CVA. With neglect, damage to the brain causes an individual to ignore one side of their visual field or their body, even if they retain sensation and function. Neglect is usually a result of a stroke affecting the right hemisphere of the brain, therefore causing neglect of the left side. Visual neglect occurs in 33 to 85% of all strokes affecting the right hemisphere.

The prognosis for recovery following a CVA is related to the severity of the CVA and how much of the brain has been damaged. Most functional recovery occurs within the first two months following a CVA.

The risk of a subsequent CVA is approximately 4% per year, with a 10 year cumulative risk of 43%. In the first six months following a CVA, the risk of a subsequent CVA is approximately 9%.

Cerebral aneurysm

A cerebral aneurysm is the localized dilation or ballooning of a cerebral artery or vein resulting from weakness in the wall of the affected vessel. Most cerebral aneurysms have no associated symptoms until they become large or rupture. The majority (50 to 80%) remain small and do not rupture.

Symptoms associated with larger aneurysms include:

- sudden severe headache
- nausea and vomiting
- visual impairment, and
- loss of consciousness.

The risk of rupture increases with the size of the aneurysm. A rupture results in subarachnoid or intracerebral hemorrhage, leading to alterations in consciousness including:

- syncope
- seizures
- visual impairment, and
- respiratory or cardiovascular instability.

Treatment of unruptured cerebral aneurysms is controversial. Treatment options include observation and surgical procedures to prevent blood from flowing into the aneurysm. Risks of surgery include possible damage to other blood vessels, potential for aneurysm recurrence and rebleeding, and post-operative CVA. Successful surgery reduces the risk of rupture.

20.2 Prevalence and incidence of cerebrovascular disease

Transient ischemic attack

The results of a survey published in 2000 by the National Stroke Association found that half a million adults (18 years of age and older) in Canada had been diagnosed with a TIA. A population-based study in Alberta found the age-adjusted incidence of TIA to be between .04% and .07% (44 and 68 per 100,000) annually.

The risk factors for a TIA are similar to those for CVA (see below).

Cerebrovascular accident

CVAs are the 4th leading cause of death in Canada and account for 7% of all deaths in Canada. Of the 40,000 to 50,000 Canadians who have a CVA each year, 14,000 will die.

The risk factors for CVA include:

- high blood pressure
- cigarette smoking
- heart disease
- carotid artery disease
- diabetes, and
- heavy use of alcohol.

The risk for males is three times greater than for females. Risk also increases with age, with those in their 70's and 80's at the greatest risk.

Cerebral aneurysm

Prevalence rates for cerebral aneurysm are unclear because they are often asymptomatic. Autopsy studies indicate a prevalence rate in the adult population between 1 and 5%, with 5% being a widely cited figure.

Under age 40, cerebral aneurysms affect equal numbers of males and females, but are rarely seen in infants and children. Over age 40, more women than men are affected. The peak age for clinical manifestation of cerebral aneurysm is between 55 and 60.

20.3 Cerebrovascular disease and adverse driving outcomes

Transient ischemic attack

There has been little research on the relationship between TIA and adverse driving outcomes.

Cerebrovascular accident

There has been little research on episodic impairment (sudden incapacitation) of driving ability due to a CVA.

In studies that considered the effects of persistent impairments from CVA as measured by fitness to drive assessments, 50% or more of the subjects who had a CVA were assessed as unfit to drive. Surveys of drivers who had a CVA indicate that more than half did not resume driving after their CVA.

Cerebral aneurysm

No studies were found that considered the relationship between cerebral aneurysm and adverse driving outcomes.

20.4 Effect of cerebrovascular disease on functional ability to drive

Transient ischemic attack

The primary concern for licensing is the potential for a subsequent CVA. The greatest risk is within the 3 months following the TIA.

Cerebrovascular accident

The primary concern for licensing is the potential for a persistent impairment of functional ability following a CVA. Depending on what part of the brain is affected, cognitive, motor or sensory functions may be impaired.

Cerebral aneurysm

The primary concern for licensing is the risk of an episodic impairment caused by rupture of the aneurysm. Generally, this risk is not considered significant for licensing purposes unless the aneurysm is symptomatic or has been identified as requiring surgical intervention

A large or leaking cerebral aneurysm could result in a persistent impairment of cognitive, motor or sensory functions depending on its size and location.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|---------------------------------|---|--|--|
| Transient ischemic attack (TIA) | Episodic impairment (risk for stroke): Medical assessment – likelihood of impairment | Variable – sudden cognitive, motor or sensory impairment | Driver's Medical Examination Report Specialist's report |

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--------------------------------|--|--|---|
| Cerebrovascular accident (CVA) | Persistent impairment: Functional assessment | Variable – cognitive, motor or sensory | Driver's Medical Examination Report Specialist's report SIMARD-MD ICBC road test DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |
| Cerebral aneurysm | Episodic impairment (risk of rupture): Medical assessment – likelihood of impairment | All – sudden impairment | Driver's Medical Examination Report Specialist's report |
| | Persistent impairment (where symptomatic): Functional assessment | Variable – cognitive, motor or sensory | Driver's Medical Examination Report Specialist's report SIMARD-MD ICBC road test DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |

20.5 Compensation

Individuals who have experienced a persistent impairment of motor or sensory function may be able to compensate. An occupational therapist, driver rehabilitation specialist, driver examiner or other medical professional may recommend specific compensatory vehicle modifications or restrictions based on an individual functional assessment.

Some examples of compensatory mechanisms are shown in the following table.

| Motor impairment | Sensory (vision) impairment |
|---|--|
| <ul style="list-style-type: none">• Steering wheel spinner knob• Left-foot accelerator pedal• Restriction to automatic transmission or power-assisted brakes• Downgrade from commercial class to private class licence | <ul style="list-style-type: none">• Scanning horizon more frequently• Turning head 90° to maximize area scanned• Large left and right side mirrors |

Little empirical research considers the relationship between vehicle modifications and adverse driving outcomes. The effectiveness of individual vehicle modifications may be determined through a road test.

GUIDELINES

20.6 Private and commercial drivers who have had a TIA

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|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have had a transient ischemic attack (TIA). |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive if: <ul style="list-style-type: none"> • it has been at least 2 weeks since the TIA, and • they follow any prescribed diagnostic or treatment regime. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • it has been at least 2 weeks since the TIA, and • they follow any prescribed diagnostic or treatment regime. |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must report any further TIAs to the OSMV, and • you must remain under regular medical supervision and follow your physician's advice regarding treatment. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. At that time, if the treating physician indicates that there have been no further TIAs or CVAs, no further reassessment, other than routine commercial or age-related reassessment, is required. |
| Policy rationale | The primary driver fitness concern with a TIA is the risk for a CVA after a TIA. By definition, there are no persistent impairments associated with a TIA. The risk for CVA is greatest immediately after the TIA and decreases significantly overtime. Subject matter experts recommended a minimum no-driving period of two weeks, with appropriate follow-up and treatment. |

20.7 Private and commercial drivers who have had a CVA

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have had a cerebrovascular accident (CVA). |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. <p>If the treating physician indicates significant residual loss of one or more of the functions necessary for driving, the OSMV will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held.</p> |
| Fitness guidelines | <p>Individuals who have had a CVA may not drive for a minimum of 1 month after the CVA. After 1 month, individuals may drive if:</p> <ul style="list-style-type: none"> • there is no apparent loss of cognitive, motor and sensory function required for driving • any underlying cause has been addressed with appropriate treatment, and • a post CVA seizure has not occurred. <p>Where a medical assessment indicates that there may be some residual loss of cognitive, motor or sensory function that could affect driving, a further functional assessment may be required.</p> |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • any underlying cause has been addressed with appropriate treatment • a post CVA seizure has not occurred (if a post CVA seizure has occurred, see the guidelines under 23.7), and • the treating physician indicates there has been no significant residual loss of the functions required for driving or, where the treating physician indicates that there may be significant residual loss of the functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report any further CVAs to the OSMV, and • you must remain under regular medical supervision and follow your physician's advice regarding treatment. |
| Restrictions | Restrictions on the licence may be required, depending upon the nature of the functional impairment and the ability of the driver to compensate. |

| | |
|--------------------------------|--|
| Reassessment guidelines | The OSMV will reassess in one year. At that time, if the treating physician indicates that there have been no further TIAs or CVAs, no further reassessment, other than routine commercial or age-related reassessment, is required. |
| Policy rationale | The primary driver fitness concern with a CVA is the potential for a persistent impairment. Subject matter experts recommended a minimum no-driving period of one month, with appropriate follow-up and treatment. |

20.8 Private and commercial drivers who have a cerebral aneurysm that requires repair

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|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have a cerebral aneurysm that requires surgical repair. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive. |
| OSMV determination guidelines | Individuals are not fit to drive. |
| Conditions | N/A |
| Restrictions | N/A |
| Reassessment guidelines | N/A |
| Policy rationale | The primary driver fitness concern with cerebral aneurysm is the risk of rupture. Where the risk of rupture is such that surgery is recommended to repair the rupture, a driver is considered unfit to drive. |

20.9 Private drivers who have had surgery to repair a cerebral aneurysm

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|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private drivers who have had surgery to repair a cerebral aneurysm. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurosurgeon. <p>If the treating physician indicates symptoms that impair one or more of the functions necessary for driving, the OSMV will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held.</p> |
| Fitness guidelines | <p>Individuals who have had surgery to repair a cerebral aneurysm may not drive for at least 3 months after surgery. After 3 months they may drive if:</p> <ul style="list-style-type: none"> • they have no symptoms of the aneurysm, or • if they continue to have symptoms, the symptoms do not impair their functional ability to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since the surgery, and • they have no symptoms of the aneurysm, or • the treating physician does not indicate that symptoms of the aneurysm may impair the functions necessary for driving, or • where the treating physician indicates that symptoms of the aneurysm may impair the functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the individual is not having symptoms, no reassessment, other than routine age-related reassessment, is required.</p> <p>If the individual is having symptoms, the OSMV will determine the appropriate reassessment interval on an individual basis, depending upon the nature and severity of the symptoms.</p> |

| | |
|--------------------------------|---|
| <p>Policy rationale</p> | <p>Successful surgical treatment for a cerebral aneurysm significantly reduces the risk of rupture. A waiting period of 3 months after surgery is imposed to allow for an assessment of the effectiveness of the surgery or any complications of surgery.</p> <p>The impact of any symptoms caused by the aneurysm or by complications from surgery should be assessed.</p> |
|--------------------------------|---|

20.10 Commercial drivers who have had surgery to repair a cerebral aneurysm

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have had surgery to repair a cerebral aneurysm. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurosurgeon. <p>If the treating physician indicates symptoms that impair one or more of the functions necessary for driving, the OSMV will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held.</p> |
| Fitness guidelines | <p>Individuals who have had surgery to repair a cerebral aneurysm may not drive for at least 6 months after surgery. After 6 months they may drive if:</p> <ul style="list-style-type: none"> • they have no symptoms of the aneurysm, or • if they continue to have symptoms, the symptoms do not impair their functional ability to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 6 months since the surgery, and • they have no symptoms of the aneurysm, or • the treating physician does not indicate that symptoms of the aneurysm may impair the functions necessary for driving, or • where the treating physician indicates that symptoms of the aneurysm may impair the functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the individual is not having symptoms, no reassessment, other than routine commercial reassessment, is required.</p> <p>If the individual is having symptoms, the OSMV will determine the appropriate reassessment interval on an individual basis, depending upon the nature and severity of the symptoms.</p> |
| Policy rationale | The waiting period for commercial drivers is longer than that for private drivers in order to provide more certainty about the success of surgery prior to a return to driving. |

Chapter 21: Vision Impairment

BACKGROUND

21.1 About vision impairment

Vision impairment is defined as a functional limitation of the visual system and can be manifested as reduced visual acuity, reduced contrast sensitivity, visual field loss, loss of depth perception, diplopia (double-vision), visual perceptual difficulties or any combination of these. This chapter focuses on more common vision impairments and medical conditions that can cause vision impairments.

Visual acuity

Visual acuity is the ability of the eye to perceive details. It can be described as either static or dynamic. Static visual acuity, the common measure of visual acuity, is defined as the smallest detail that can be distinguished in a stationary, high contrast target (e.g. an eye chart with black letters on a white background). When tested, it is reported as the ratio between the test subject's visual acuity and standard "normal" visual acuity. Normal visual acuity is described as 20/20 or 6/6 in metric. A person with 20/40 vision (6/12 metric) needs to be 20 feet (6 metres) away to distinguish detail that a person with normal vision can distinguish at 40 feet (12 metres). The standard Snellen chart for measuring visual acuity and a table of standard ratings is included in 21.16.

Dynamic visual acuity is the ability to distinguish detail when there is relative motion between the object and the observer. Given the nature of driving, dynamic visual acuity would seem to be more relevant to driving fitness than static visual acuity. However, barriers to the use of dynamic visual acuity for fitness to drive decision-making include the absence of a practicable method of testing dynamic visual acuity, limited research on its relevancy for driving, and the lack of established levels of dynamic visual acuity required for driving safely.

Visual field

The visual field is the extent of the area that a person can see with their eyes held in a fixed position, usually measured in degrees. The normal binocular (using both eyes) visual field is 135 degrees vertically and 180 degrees horizontally from the fixed point.

The visual field can be divided into central and peripheral portions. Central vision refers to vision within 30 degrees of the point of fixation or gaze. The macula, a small area in the centre of the retina, is responsible for fine, sharp, straight-ahead central vision. Peripheral vision allows for the detection of objects and movement outside the scope of central vision.

Visual field impairment refers to a loss of part of the normal visual field. The term “scotoma” refers to any area where the area of lost visual field is surrounded by normal vision. See 21.17 for more information on types of visual field impairments.

Common vision impairments

Blindness/low vision

Total blindness is the complete lack of vision and is often described as no light perception. A person may be considered ‘blind’ even though they have some vision. There is no universally accepted level of visual acuity to define blindness. In North America and most of Europe a person is considered to be legally blind if their visual acuity is 20/200 (6/60) or less in the better eye with the best correction possible, or if their visual field is less than 20 degrees in diameter. The World Health Organization (WHO) defines “low vision” as visual acuity between 20/60 (6/18) and 20/400 (6/120) or a visual field between 10 and 20 degrees in diameter. The WHO definition of “blindness” is visual acuity less than 20/400 (3/60) or a visual field less than 10 degrees.

Myopia, hyperopia, and astigmatism (refractive errors)

Myopia, hyperopia, and astigmatism are conditions associated with reduced visual acuity. They are known as refractive errors and are the result of errors in the focusing of light by the eye.

Myopia (nearsightedness) is a condition in which near objects are seen clearly but distant objects do not come into proper focus. Individuals with normal daytime vision may experience “night myopia”. Night myopia is believed to be caused by pupils dilating to let more light in, which adds aberrations that result in nearsightedness. It is more common in younger individuals and people who are myopic.

Hyperopia (farsightedness) is a condition in which distant objects are seen clearly but close objects do not come into focus. Age-related farsightedness is called presbyopia. It is not a disease, but occurs as a natural part of the aging process of the eye and usually becomes noticeable as an individual enters their early to mid 40’s.

Astigmatism is a visual condition that results in blurred vision. It commonly occurs with other conditions such as myopia and hyperopia.

Monocular vision/Loss of stereoscopic depth perception

Monocular vision refers to having vision in one eye only and is associated with the loss of stereoscopic vision. Stereoscopic vision, in which the brain processes information from each eye to create a single visual image, is integral to depth perception in those with binocular vision.

Impaired colour vision

Individuals with impaired colour vision (colour blindness) lack a perceptual sensitivity to some or all colours. These impairments are usually congenital and in general, individuals learn to compensate for the inability to distinguish colours when driving. Therefore, colour vision impairments are not routinely considered by the OSMV as a matter of driver fitness.

Impaired contrast sensitivity

Visual contrast sensitivity refers to the ability to perceive differences between an object and its background. Depending on the cause, a loss of contrast sensitivity may or may not be associated with a corresponding loss of visual acuity. Declines in contrast sensitivity are associated with normal aging, and can also result from conditions such as cataracts, age-related macular degeneration, glaucoma, and diabetic retinopathy.

Dark adaptation and glare recovery

Dark adaptation refers to the process in which the visual system adjusts to a change from a well lit environment to a dark environment. Glare recovery refers to the process in which the eyes recover visual sensitivity following exposure to a source of glare, such as oncoming headlights when driving at night.

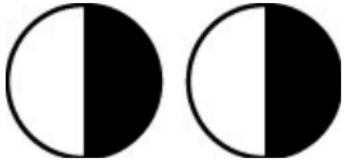



Prolonged dark adaptation is associated with normal aging and results in decreased visual acuity at night. It may also be the result of a medical condition, and where severe, may be referred to as 'night blindness'. Night blindness may be caused by a number of medical conditions including retinitis pigmentosa, vitamin A deficiency, diabetes, cataracts or macular degeneration.

As with dark adaptation, individuals require a longer time to recover from glare as they age. In addition, medical conditions associated with prolonged glare recovery include cataracts and corneal edema. Individuals may also experience prolonged glare recovery following laser assisted in situ keratomileusis (LASIK) or panretinal laser photocoagulation (PRP) surgery.

A number of illnesses can affect glare recovery time, with prolonged recovery times reported in individuals with diabetes, vascular disease, and hypertension. Retinal conditions with demonstrated relationships to prolonged glare recovery include age-related maculopathy, 'cured' retinal detachment, and central serous retinopathy.

Hemianopia and quadrantanopia

Hemianopia, vision loss in one half of the visual field, or quadrantanopia, vision loss in one quarter of the visual field, can occur as a result of stroke, trauma, or a tumour. They are not usually caused by a problem with the eye itself. Examples of hemianopia and quadrantanopia are provided below. The shaded areas represent vision field loss.

| | |
|--|---|
|  <p>Right homonymous hemianopia</p> |  <p>Binasal hemianopia</p> |
|  <p>Left superior homonymous quadrantanopia</p> |  <p>Bitemporal hemianopia</p> |

An important consideration related to hemianopia is the potential for anosognosia. Anosognosia is a condition in which a person with an impairment caused by a brain injury is unaware of the impairment. Research indicates that hemianopic anosognosia is relatively frequent, occurring in approximately two-thirds of those with hemianopia. Unawareness of visual field deficits has an obvious negative impact on safe driving performance.

Diplopia

Diplopia (double vision) is the simultaneous perception of two images of a single object. These images may be displaced horizontally, vertically, or diagonally in relation to each other.

Diplopia can be binocular or monocular. Binocular diplopia is present only when both eyes are open, with the double vision disappearing if either eye is closed or covered. Monocular diplopia is also present with both eyes open, but unlike binocular diplopia, the diplopia persists when the problematic eye is open and the other eye is closed or covered.

Binocular diplopia, or true diplopia, is an inability of the visual system to properly fuse the images viewed by each eye into a single image. It may be caused by the physical misalignment of the eyes (strabismus) or diseases such as Parkinson's disease or multiple sclerosis. Two of the most common causes of binocular diplopia in people over 50 are thyroid conditions such as Grave's disease, and cranial nerve damage.

Monocular diplopia is not caused by misalignment, but rather by problems in the eye itself. Astigmatism, dry eye, corneal distortion or scarring, vitreous abnormalities, cataracts, and other conditions can cause monocular diplopia.

Nystagmus

Nystagmus is an involuntary, rapid, rhythmic movement of the eyeball. The movements may be horizontal, vertical, rotary, or mixed. Nystagmus which occurs before 6 months of age is called congenital or early onset, whereas that occurring after 6 months is labelled acquired nystagmus. Early onset nystagmus may be inherited, or the result of eye or visual pathway defects. In many cases, the cause is unknown. Causes of acquired nystagmus are many and it may be a symptom of another condition such as stroke, multiple sclerosis, or even a blow to the head.

Many individuals with nystagmus have significant impairments in their vision, with some having low vision or legal blindness.

Medical conditions causing vision impairment

Cataracts

A cataract is an opacification or clouding of the crystalline lens of the eye, which blocks light from reaching the retina. Cataracts may be due to a variety of causes. Some are congenital, but few occur during the early years of life. The majority of cataracts are the result of the aging process. The presence of a cataract can interfere with visual functioning by decreasing acuity, contrast sensitivity, and visual field.

Diabetic retinopathy

Diabetic retinopathy is the most common eye disease in those with diabetes and results in significant impairments in vision (blurred vision, vision loss) and is a leading cause of blindness in adults. It is caused by changes in the blood vessels of the retina (microvascular retinal changes) as a result of the disease.

There are two types of diabetic retinopathy: background (non-proliferative) and proliferative. Background retinopathy reflects early changes in the retina and often is asymptomatic. However, it may result in decreased visual acuity. Background diabetic retinopathy can progress into a more advanced or proliferative stage.

Proliferative retinopathy is the result of retinal hypoxia (lack of oxygen to the retina) and carries a much graver prognosis. The lack of oxygen to the retina results in a proliferation of new vessels in the retina or on the optic disc (neovascularization). Without treatment, the new vessels can leak blood into the centre of the eye, resulting in blurred vision. Fluid (exudate) also can leak into the centre of the macula (that part of the eye where sharp, straight-ahead vision occurs), a condition called macular edema. The leakage causes swelling of the macula resulting in blurred vision. Macular edema can occur at any stage of diabetic retinopathy, but is more likely to occur as the disease progresses. Research indicates that approximately half of those with proliferative retinopathy also have macular edema.

An example of the effects of diabetic retinopathy on vision is shown below¹⁰.



Normal vision

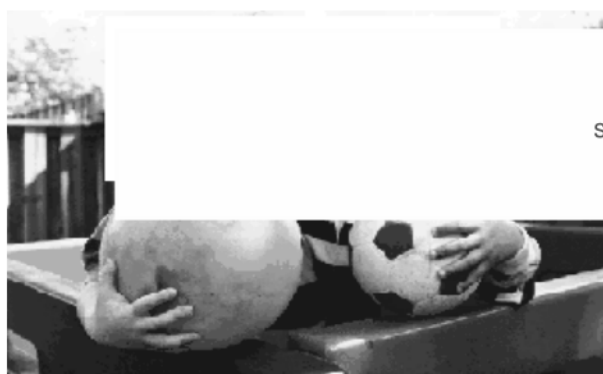


Vision of individual with diabetic retinopathy

Glaucoma

Glaucoma is a group of diseases characterized by increased intraocular pressure. The increased pressure can lead to optic nerve damage, resulting in blindness. Types of glaucoma include adult primary glaucoma, secondary, congenital and absolute glaucoma. Open angle glaucoma, a type of adult primary glaucoma is the most common. It is often referred to as the 'silent blinder' because extensive damage may occur before the patient is aware of the disease. Early diagnosis and treatment are important for the prevention of optic nerve damage and visual field loss (primarily peripheral vision) due to glaucoma.

An example of the effects of glaucoma on vision is shown below¹¹.



Normal vision



Vision of individual with glaucoma

¹⁰ Source National Eye Institute - http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

¹¹ Source National Eye Institute - http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

Age-related macular degeneration (ARMD)

Age-related macular degeneration (ARMD) is associated with the advanced stages of age-related maculopathy, or disease of the macula. The macula is the central portion of the retina and is responsible for central vision in the eye. Most individuals with maculopathy have impairments in their central vision. Those with ARMD, however, experience a progressive destruction of the photoreceptors in the macula, resulting in profound central vision loss.

ARMD has two forms, dry and wet. The dry form is the result of atrophy to the retinal pigment, resulting in vision loss due to the loss of photoreceptors (rods and cones) in the central portion of the eye. High doses of certain vitamins and minerals have been shown to slow the progression of the disease and reduce associated vision loss.

Wet ARMD (neovascular or exudative) is due to abnormal blood vessel growth in the eye, leading to blood and protein leakage in the macula. The bleeding, leaking, and scarring from these blood vessels eventually result in damage to the photoreceptors, with a rapid loss of vision loss if left untreated. Treatment for wet ARMD has improved. Recent pharmaceutical advancements have resulted in compounds that, when injected directly into the vitreous humor, can cause regression of the abnormal blood vessels, leading to an improvement in vision.

An example of the effects of ARMD on vision is shown below¹².



Normal vision



Vision of individual with macular degeneration

¹² Source National Eye Institute - http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

Retinitis pigmentosa

Retinitis pigmentosa is the term given to a group of hereditary retinal diseases that result in the degeneration of rod and cone photoreceptors. The diseases cause progressive visual loss, ending in blindness. Night blindness is an early symptom of retinitis pigmentosa, followed by a constriction of the peripheral visual field. Loss of central vision typically occurs late in the course of the illness.

Typically, symptoms are not prominent in childhood, but with progressive degeneration of the photoreceptor cells, vision is gradually lost during adolescence and adulthood.

Medical treatments causing vision impairment

Laser surgery – LASIK and PRP

Laser surgery may also cause vision impairments. Laser assisted in situ keratomileusis (LASIK) is a type of refractive laser eye surgery performed by ophthalmologists. It is increasingly being used to correct myopia, hyperopia, and astigmatism. Panretinal laser photocoagulation (PRP) is the current treatment of choice for diabetic retinopathy.

Possible complications of laser procedures include over or under correction, regression (return to the original refractive state), halos and glare, double vision (ghosting), loss of contrast sensitivity, and loss of visual acuity.

21.2 Prevalence and incidence of vision impairments

Blindness/low vision

Based on WHO classifications, the prevalence of low vision and blindness in Canada is 35.6 and 3.8 per 10,000 individuals, respectively. Among individuals with some vision loss (vision worse than 20/40), cataract and visual pathway disease were the most common causes, together accounting for 40% of visual impairment. Age-related macular degeneration and other retinal diseases were the next most common causes of vision loss, with diabetic retinopathy and glaucoma less frequently encountered as causes of visual impairment.

Myopia, hyperopia, astigmatism, and presbyopia (refractive errors)

The prevalence of visual conditions such as astigmatism, hyperopia, myopia, and presbyopia in Canada is difficult to determine due to the absence of population based studies evaluating the ocular health of Canadians.

Night myopia is relatively common among younger individuals, with an estimated prevalence of 38% in those 16 to 25 years of age.

Monocular vision, impaired contrast sensitivity, impaired dark adaptation and glare recovery

There are no data on the prevalence of monocular vision, impaired contrast sensitivity, or impaired dark adaptation and glare.

Visual field loss including hemianopia

Research indicates that the prevalence of visual field loss for those age 16 to 60 years is between 3 and 3.5%, rising to 13% for those 65 and older.

Diplopia

There are no data on the prevalence of diplopia.

Nystagmus

Although the prevalence of nystagmus is not accurately known, the condition is believed to affect around 1 in 5,000 individuals.

21.3 Prevalence and incidence of medical conditions causing vision impairments

Cataracts

Canadian data on the prevalence of cataracts are lacking, but statistics from the United States indicate that approximately 17% of Americans 40 years old and older have a cataract on at least one eye. Cataracts frequently occur bilaterally (in both eyes), with the prevalence of bilateral cataracts greater among women than men. Overall prevalence of cataracts increases with age, leading to increasing prevalence in the future as the population ages. United States census estimates project that the prevalence of cataracts will increase by 50% by the year 2020.

Cataracts are more common in women and affect Caucasians somewhat more frequently than other races, particularly with advancing age. Risk factors for age-related cataracts include diabetes, prolonged exposure to sunlight, use of tobacco, and use of alcohol.

Diabetic retinopathy

Individuals with both Type 1 and Type 2 diabetes are at-risk for diabetic retinopathy. At present there is little published information about the prevalence of diabetic retinopathy in Canada. A study from the United States indicates that, after 20 years from the onset of diabetes, over 90% of people with Type 1 diabetes and more than 60% of people with Type 2 diabetes will have diabetic retinopathy.

Glaucoma

Approximately 67 million people worldwide have glaucoma, with more than 250,000 affected in Canada. Two percent of people over the age of 40 have glaucoma and the prevalence increases to 4% to 6% in people over 60. Those at increased risk for developing glaucoma include Blacks, those over the age of 60, and individuals with a family history of glaucoma.

Glaucoma is one of the leading causes of blindness, accounting for between 9% and 12% of all cases of blindness. The rate of blindness from glaucoma is between 93 and 126 per 100,000 population 40 years or older.

Age-related macular degeneration (ARMD)

In Canada today, more than two million people over the age of 50 have some form of ARMD, with the numbers projected to triple in the next 25 years due to the aging of the population. Dry ARMD is more common than wet ARMD, accounting for 85% of all cases of ARMD. The greatest risk factor for acquiring macular degeneration is age. Other risk factors include gender (females more at risk than males), race (Caucasians more at risk than Blacks), smoking, and family history.

Retinitis pigmentosa

The worldwide prevalence of retinitis pigmentosa is approximately 1 in 4,000. Based on this prevalence rate, approximately 8,500 individuals in Canada currently suffer from retinitis pigmentosa.

21.4 Prevalence and incidence of vision impairments resulting from medical treatments

Laser surgery – LASIK and PRP

The incidence of unresolved complications in refractive surgery (e.g. LASIK) patients six months after surgery has been estimated to range from 3% to 6%.

21.5 Vision impairments and adverse driving outcomes

Myopia, hyperopia, astigmatism, and presbyopia (refractive errors) and low vision

There is a considerable body of research examining the relationship between static visual acuity and driving performance. Despite the obvious importance of vision when driving, research has failed to find a strong relationship between the two. One of the primary reasons for this is methodological. Given that most jurisdictions have minimum vision requirements for licensing, individuals with significant vision impairments are not licensed and therefore not included in measures of driving performance.

Monocular vision

Research on monocular vision and driving is limited, with most studies conducted before 1980. The evidence suggests that monocular drivers have higher crash and traffic violation rates.

Impaired contrast sensitivity

In general, the available research suggests that impairments in contrast sensitivity are associated with impairments in driving performance. However, those associations are insufficient to support specific decisions regarding loss of contrast sensitivity and continued driving. More research is required to develop screening tools for contrast sensitivity that are valid and reliable in the driver fitness context.

Dark adaptation and glare recovery

Despite its obvious relevance to safe driving performance, there is little in the way of research to assist the medical community or licensing agency personnel in making decisions related to dark adaptation, glare recovery, and driving.

Visual field loss including hemianopia

A significant body of literature now exists on the relationship between visual field loss and driving performance, as measured either by crashes, on-road performance, or from simulator studies. Few studies have been done on hemianopia and driving. Taken together, the results from the on road and crash literature suggest that visual field deficits can and do compromise driving performance. However, the current body of evidence fails to inform on the extent of deficit in the visual field that must be present before driving is impaired.

Diplopia and Nystagmus

There is little or no research on diplopia or nystagmus and driving performance.

Cataracts

Results on the impact of cataracts on driving performance are mixed, with some studies showing increased risk of crashes, ranging from 1.3 to 2.5 times higher than those without cataracts. However, other studies have failed to find an association between cataracts and crash rates. Results from studies that have examined self-reported difficulties in driving performance are more uniform, with the majority of participants reporting difficulties in many aspects of driving.

Notably, cataract surgery results in an improvement in visual functioning. However, a significant percentage of individuals continue to report difficulties in driving, particularly at night. An important consideration is when driving can safely resume following cataract surgery. Unfortunately, there is a paucity of data to inform on this issue. Of equal importance are the effects of wait times for cataract surgery on visual functions related to driving. Current literature

indicates that wait times of 6 months or longer result in decrements in vision that may have an impact on safe driving performance.

Diabetic retinopathy

The majority of research on diabetic retinopathy and driving is concerned with the effects of laser surgery (panretinal laser photocoagulation [PRP]) for proliferative diabetic retinopathy on visual fields. PRP reduces the risk of severe visual loss in proliferative diabetic retinopathy but also is associated with visual field loss and reductions in peripheral vision. See the discussion of visual field loss and driving above.

Glaucoma

There is evidence that individuals with glaucoma are at a significantly greater risk for impaired driving performance than those without the disease, likely to due to loss of visual field. See the discussion of visual field loss and driving above.

Age-related macular degeneration (ARMD) and retinitis pigmentosa

There is little research on the relationship between ARMD or retinitis pigmentosa and driving performance. See the discussion of visual field loss and driving above.

21.6 Effect of vision impairments on functional ability to drive

Individuals with impaired visual acuity may lack the ability to perceive necessary details while driving. Visual field impairments may interfere with driving by limiting the area that an individual can see.

Individuals with reduced contrast sensitivity may have difficulty seeing traffic lights or cars at night. Limitations in research and testing preclude guidelines for impairments in contrast sensitivity, dark adaptation, or glare recovery, although some individuals with these impairments may not be fit to drive.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|-------------------|---|--|--|
| Vision impairment | Persistent impairment: Functional assessment | Sensory - Vision | Driver's Medical Examination Report ICBC vision screening Examination of visual functions (EVF) (see sample form in 21.18) Visual field test (VFT) (see sample form in 21.19) ICBC road test Functional assessment by an occupational therapist or driver rehabilitation specialist |

21.7 Compensation

The loss of certain visual functions can be compensated for adequately, particularly in the case of long-standing or congenital impairments. When a person becomes visually impaired, the capacity to drive safely varies with their ability to compensate. As a result, there are people with visual deficits who do not meet the vision standards for driving but who are able to drive safely.

Corrective lenses

Most individuals can compensate for a typical loss of visual acuity from myopia, hyperopia, astigmatism, or presbyopia by wearing eyeglasses or contact lenses.

Telescopic lenses/other low vision aids

Telescopic (bioptic) lenses are sometimes used to assist individuals with low vision. A telescopic lens typically is mounted at the top half of a regular spectacle lens, and provides the driver with a magnified view of objects (e.g., text or detail of traffic signs that otherwise could be seen only at distances too short for a safe or timely stop). For the most part, the driver views the road through the spectacle lens, looking intermittently through the telescopic lens to read road signs, determine the status of traffic lights, or scan ahead for road hazards.

Although telescopic spectacles, hemianopia aids and other low vision aids may enhance visual function, there are significant problems associated with their use in driving a motor vehicle. These include the loss of visual field, magnification causing apparent motion and the illusion of nearness. There has been little research to evaluate the use of telescopic lenses for driving by individuals with low vision. Although limited, studies indicate that drivers with low vision who drive with telescopic lenses have higher crash rates. These studies were not controlled for driving exposure, suggesting that the crash rates per kilometre driven may be substantially higher than reported.

Given the known issues, the OSMV currently does not allow the use of telescopic lenses for driving.

Prism lenses/eye patch

Individuals with binocular diplopia may be able to compensate for their impairment with the use of prism lenses or an eye patch.

Driving in daylight only

Individuals who have a vision impairment may be able to compensate for their impairment by driving during daylight hours only.

Strategies to compensate for visual field loss

Individuals with visual field loss may be able to compensate for their reduced visual field by practicing more rigorous scanning techniques involving more frequent eye and head movement.

GUIDELINES

21.8 Private drivers with impaired visual acuity

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| Application | These guidelines apply to driver fitness determinations for private drivers who have impaired visual acuity. |
| Assessment guidelines | <p>If further information regarding an individual's visual acuity is required, the OSMV will request:</p> <ul style="list-style-type: none"> • an Examination of Visual Functions (EVF), or • a vision screening at an ICBC Point of Service, if an individual does not live in a community with an optometrist or ophthalmologist. <p>The recommended testing procedures are outlined in 21.20.</p> <p>If an individual has a visual acuity of between 20/50 and 20/70 with both eyes open and examined together, the OSMV will request an ICBC road test. The OSMV will not generally request an ICBC road test for individuals who have a visual acuity of less than 20/70.</p> |
| Fitness guidelines | Individuals may drive if they have visual acuity not less than 20/50 (6/15) with both eyes open and examined together. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have visual acuity not less than 20/50 (6/15) with both eyes open and examined together, or • a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will impose the following restriction on an individual who requires corrective lenses in order to meet the fitness guidelines:</p> <p># 21 Corrective lenses required</p> |
| Reassessment guidelines | <p>If the condition causing the impaired visual acuity is not progressive, no reassessment, other than routine age-related reassessment, is required. This includes:</p> <ul style="list-style-type: none"> • myopia • hyperopia, and • astigmatism. <p>The OSMV will reassess individuals with cataracts annually until the cataracts are removed.</p> <p>The OSMV will reassess individuals with macular degeneration annually.</p> |

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| | <p>The OSMV will reassess individuals with glaucoma and diabetic retinopathy depending upon their visual acuity. Individuals with best corrected vision of 20/40 or better will be reassessed every two years. Individuals with best corrected vision of 20/50 or worse will be reassessed annually.</p> |
| <p>Policy rationale</p> | <p>There is little research evidence regarding the level of visual acuity required for driving fitness. The minimum acuity requirement in the guideline is based on consensus medical opinion in Canada. Because there is no definitive level of acuity established for driving fitness, those who do not meet the acuity level in the guideline may request an individual functional assessment.</p> |

21.9 Commercial drivers with impaired visual acuity

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| Application | These guidelines apply to driver fitness determinations for commercial drivers who have impaired visual acuity. |
| Assessment guidelines | <p>If further information regarding an individual's visual acuity is required, the OSMV will request either:</p> <ul style="list-style-type: none"> • an Examination of Visual Functions (EVF), or • a vision screening at an ICBC Point of Service, if an individual does not live in a community with an optometrist or ophthalmologist. <p>The recommended testing procedures are outlined in 21.20.</p> <p>If an individual has a visual acuity of between 20/30 and 20/50 with both eyes open and examined together, the OSMV will request an ICBC road test. The OSMV will not generally request an ICBC road test for individuals who have a visual acuity of less than 20/50.</p> |
| Fitness guidelines | Individuals may drive if they have visual acuity not less than 20/30 (6/9) with both eyes open and examined together. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have visual acuity not less than 20/30 (6/9) with both eyes open and examined together, or • a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will impose the following restriction on an individual who requires corrective lenses in order to meet the fitness guidelines:</p> <p># 21 Corrective lenses required</p> |
| Reassessment guidelines | <p>If the condition causing the impaired visual acuity is not progressive, no reassessment, other than routine commercial reassessment, is required. This includes:</p> <ul style="list-style-type: none"> • myopia • hyperopia, and • astigmatism. <p>The OSMV will reassess individuals with cataracts annually until the cataracts are removed.</p> <p>The OSMV will reassess individuals with macular degeneration annually.</p> <p>The OSMV will reassess individuals with glaucoma and diabetic retinopathy depending upon their visual acuity. Individuals with best</p> |

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| | corrected vision of 20/30 or better will be reassessed every two years. Individuals with best corrected vision of 20/40 or worse will be reassessed annually. |
| Policy rationale | There is little research evidence regarding the level of visual acuity required for driving fitness. The minimum acuity requirement in the guideline is based on consensus medical opinion in Canada. Because there is no definitive level of acuity established for driving fitness, those who do not meet the acuity level in the guideline may request an individual functional assessment. |

21.10 Private drivers with visual field loss

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| Application | These guidelines apply to driver fitness determinations for private drivers who have visual field loss. |
| Assessment guidelines | <p>Driver fitness determinations that involve interpretation of a visual field study should be made by case managers.</p> <p>If further information regarding an individual's visual field loss is required, the OSMV will request:</p> <ul style="list-style-type: none"> • an Examination of Visual Functions (EVF) • a binocular visual field test (VFT), or • a vision screening at an ICBC Point of Service, if an individual does not live in a community with an optometrist or ophthalmologist. <p>The recommended testing procedures are outlined in 21.20.</p> <p>If an individual does not meet the visual field standard outlined below, the OSMV may request:</p> <ul style="list-style-type: none"> • an ICBC road test, or • if the visual field deficit is severe, an assessment by an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | Individuals may drive if their visual field is at least 120 continuous degrees along the horizontal meridian and 15 continuous degrees above and below fixation with both eyes open and examined together. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their visual field is at least 120 continuous degrees along the horizontal meridian and 15 continuous degrees above and below fixation with both eyes open and examined together, or • a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will impose the following restriction if a functional assessment indicates that an individual does not have the functional ability to drive at night:</p> <p># 12 Restricted to daylight hours only</p> |
| Reassessment guidelines | <p>If the condition causing the visual field loss is not progressive, no reassessment, other than routine age-related reassessment, is required. This includes:</p> <ul style="list-style-type: none"> • eye trauma • stroke, and • head injury. <p>For individuals with medical conditions that cause progressive visual</p> |

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| | <p>field loss, such as:</p> <ul style="list-style-type: none"> • retinitis pigmentosa • diabetic retinopathy • vascular retinopathy • glaucoma, or • brain tumour <p>the OSMV will reassess by issuing an EVF every 1 to 3 years, depending upon the rate of progression and severity of the visual field loss.</p> |
| Policy rationale | <p>There is little research evidence regarding the level of visual field required for driving fitness. The minimum visual field requirement in the guideline is based on consensus medical opinion in Canada. Because there is no definitive level of visual field established for driving fitness, those who do not meet the level of visual field required in the guideline may request an individual functional assessment.</p> |

21.11 Commercial drivers with visual field loss

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have visual field loss. |
| Assessment guidelines | <p>Driver fitness determinations that involve interpretation of a visual field study should be made by case managers.</p> <p>If further information regarding an individual's visual field loss is required, the OSMV will request:</p> <ul style="list-style-type: none"> • an Examination of Visual Functions (EVF) • a binocular visual field test (VFT), or • a vision screening at an ICBC Point of Service, if an individual does not live in a community with an optometrist or ophthalmologist. <p>The recommended testing procedures are outlined in 21.20.</p> <p>If an individual does not meet the visual field standard outlined below, the OSMV may request:</p> <ul style="list-style-type: none"> • an ICBC road test, or • if the visual field deficit is severe, an assessment by an occupational therapist or driver rehabilitation specialist. |
| Fitness guidelines | Individuals may drive if their visual field is at least 150 continuous degrees along the horizontal meridian and 20 continuous degrees above and below fixation with both eyes open and examined together |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • their visual field is at least 150 continuous degrees along the horizontal meridian and 20 continuous degrees above and below fixation with both eyes open and examined together, or • a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the condition causing the visual field loss is not progressive, no reassessment, other than routine commercial reassessment, is required. This includes:</p> <ul style="list-style-type: none"> • eye trauma • stroke, and • head injury. <p>For individuals with medical conditions that cause progressive visual field loss, such as:</p> <ul style="list-style-type: none"> • retinitis pigmentosa |

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| | <ul style="list-style-type: none"> • vascular retinopathy • glaucoma, or • brain tumour <p>the OSMV will reassess by issuing an EVF every 1 to 3 years, depending upon the rate of progression and severity of the visual field loss.</p> <p>The OSMV will reassess commercial drivers with diabetic retinopathy annually in accordance with the guidelines for commercial drivers with diabetes.</p> |
| Policy rationale | <p>There is little research evidence regarding the level of visual field required for driving fitness. The minimum visual field requirement in the guideline is based on consensus medical opinion in Canada. Because there is no definitive level of visual field established for driving fitness, those who do not meet the level of visual field required in the guideline may request an individual functional assessment.</p> |

21.12 Private drivers with a loss of stereoscopic depth perception or monocularity

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|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who:</p> <ul style="list-style-type: none"> • lose stereoscopic depth perception, or • become monocular. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive if sufficient time (typically 1 to 3 months) has elapsed since their loss of stereoscopic depth perception to allow them to adjust and compensate for their change in vision. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine age-related reassessment, is required. |
| Policy rationale | Individuals with monocular vision can compensate for the loss of stereoscopic depth perception by using visual cues such as the relative size of objects and generally have adequate depth perception for everyday activities such as driving. The Canadian Ophthalmological Society notes that a driver who has recently lost the sight of an eye or stereoscopic vision may require a few months to recover the ability to judge distance accurately. |

21.13 Commercial drivers with a loss of stereoscopic depth perception or monocularity

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who:</p> <ul style="list-style-type: none"> • lose stereoscopic depth perception, or • become monocular. |
| Assessment guidelines | The OSMV will request an ICBC road test. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they meet the fitness guidelines for visual acuity and visual field • it has been at least one month since the loss of stereoscopic depth perception, and • they complete a road test that indicates they are able to compensate for their change in vision. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if they successfully complete an ICBC road test. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial reassessment, is required. |
| Policy rationale | <p>Individuals with monocular vision can compensate for the loss of stereoscopic depth perception by using visual cues such as the relative size of objects and generally have adequate depth perception for everyday activities such as driving. The Canadian Ophthalmological Society notes that a driver who has recently lost the sight of an eye or stereoscopic vision may require a few months to recover the ability to judge distance accurately.</p> <p>For commercial drivers who lose stereoscopic depth perception after being licensed, a road test is required in order to confirm that they are able to compensate for the loss.</p> |

21.14 Private and commercial drivers with diplopia

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have diplopia within the central 40 degrees of primary gaze (i.e. 20 degrees to the left, right, above, and below fixation). |
| Assessment guidelines | <p>If further information is required, the OSMV will request an Examination of Visual Functions (EVF).</p> <p>The OSMV may request an ICBC road test if the diplopia is a new condition and the treating ophthalmologist or optometrist indicates any concern about the individual's ability to compensate for the condition.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> the diplopia can be corrected using an eye patch or prism lenses to meet the guideline above, and the treating ophthalmologist or optometrist indicates that adequate adjustment has occurred. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> the diplopia can be corrected using an eye patch or prism lenses so that they no longer have diplopia within the central 40 degrees of primary gaze, and the treating ophthalmologist or optometrist, or a road test, indicates that adequate adjustment has occurred. |
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will impose the following restriction on an individual who requires prism lenses in order to meet the fitness guidelines: # 21 Corrective lenses required</p> <p>The OSMV will impose the following restriction on an individual who requires an eye patch in order to meet the fitness guidelines: # 51 Must patch one eye while driving</p> |
| Reassessment guidelines | <p>If the diplopia is the result of a progressive condition, the OSMV will reassess as recommended by the treating physician or in accordance with the reassessment guidelines for that medical condition.</p> <p>Otherwise, no reassessment, other than routine commercial or age-related reassessment, is required.</p> |
| Policy rationale | Consensus medical opinion in Canada indicates that an individual who has diplopia within the central 40 degrees of primary gaze is unfit to drive. Where an individual can compensate for this impairment with the use of an eye patch or prism lenses, they may be fit to drive. |

21.15 Private and commercial drivers with impaired colour vision

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| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have impaired colour vision. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive unless a lack of insight or cognitive impairment impairs their ability to compensate for their deficit. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial or age-related reassessment, is required. |
| Policy rationale | Impaired colour vision is usually congenital and in general, individuals learn to compensate for the inability to distinguish colours when driving. Therefore, colour vision impairments are not routinely considered by the OSMV as a matter of driver fitness. |

21.16 Snellen chart and standard ratings of visual acuity



| Standard ratings in feet and metres | |
|-------------------------------------|--------|
| Feet | Metres |
| 20/200 | 6/60 |
| 20/100 | 6/30 |
| 20/70 | 6/21 |
| 20/50 | 6/15 |
| 20/40 | 6/12 |
| 20/30 | 6/9 |
| 20/25 | 6/7.5 |
| 20/20 | 6/6 |
| 20/15 | 6/4.5 |
| 20/10 | 6/3 |

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Withheld pursuant to/removed as

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21.18 Examination of visual functions form (EVF)

EXAMINATION OF VISUAL FUNCTIONS (EVF)

Paid for by the Office of the Superintendent of Motor Vehicles through the MSP Billing System (see form back)

OPTOMETRISTS
MSP Fee Code 96224
(EVF Only)
OR
MSP Fee Code 96223
(EVF and VFT)

PERSONAL HEALTH NUMBER
(MUST BE COMPLETED)

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The personal information on this form is collected under the authority of the *Motor Vehicle Act*, *Medicare Protection Act*, and the *Freedom of Information and Protection of Privacy Act*. The information provided will be used to determine your fitness to drive a motor vehicle and allow the physician to bill through the British Columbia Medical Services Plan for the service. Personal information is protected from unauthorized use and disclosure in accordance with the *Freedom of Information and Protection of Privacy Act* and may be disclosed only as provided by that Act. If you have any questions about the collection, use and disclosure of the information collected, contact the Office of the Superintendent of Motor Vehicles at (250) 387-7747.

THIS REPORT MUST BE COMPLETED IN FULL BY AN OPTOMETRIST AND RETURNED WITHIN 30 DAYS TO THE OFFICE OF THE SUPERINTENDENT OF MOTOR VEHICLES

| | | | |
|----------------|--|----------------|--|
| Driver's Name: | | | |
| DL#: | | Date Issued: | |
| Licence Class: | | Date of Birth: | |

Reason for This Examination: This person has been referred to determine if he/she meets the vision guidelines for the class of driver's licence indicated above.

1. BINOCULAR CENTRAL VISUAL ACUITY

| | | | | | |
|-------------|-----|--------------------|-----|-----------------|-----|
| UNCORRECTED | 20/ | PRESENT CORRECTION | 20/ | BEST CORRECTION | 20/ |
|-------------|-----|--------------------|-----|-----------------|-----|

2. BINOCULAR DEGREES OF CONTINUOUS HORIZONTAL FIELD OF VISION (WHILE WEARING CORRECTION) _____

2.a BINOCULAR DEGREES OF CONTINUOUS FIELD OF VISION ABOVE AND BELOW FIXATION (WHILE WEARING CORRECTION) _____

3. VISUAL FIELD DEFICIT ☐ NO ☐ YES **IF YES, A VISUAL FIELD TEST IS REQUIRED.**
SEE REVERSE FOR APPROVED STUDY TYPES

4. PROGRESSIVE EYE CONDITION ☐ NO ☐ YES **IF YES, PROVIDE DIAGNOSIS AND DESCRIBE FULLY.**

5. DIPLOPIA IN CENTRAL FIELD (40 degrees) ☐ NO ☐ YES **IF YES, HOW DOES THE DRIVER COMPENSATE?**
DESCRIBE FULLY

6. OTHER SIGNIFICANT OCULAR DEFECTS ☐ NO ☐ YES **IF YES, PROVIDE DISGNOSIS AND DESCRIBE FULLY.**

7. WERE NEW LENSES FOR DRIVING PRESCRIBED? ☐ NO ☐ YES

| | |
|--|--|
| EXAMINING OPTOMETRIST'S NAME AND ADDRESS (Use Rubber Stamp or Print) TELEPHONE NUMBER: | EXAMINATION DATE (YYYY/MM/DD) |
| | SIGNATURE OF EXAMINING OPTOMETRIST |

To the Driver:

- Under section 29 of the *Motor Vehicle Act* the Superintendent of Motor Vehicles requires you to have this form completed for one of the following reasons:
 - you failed a vision test at an ICBC Driver Services Centre
 - your recently reported visual status did not provide all the information we require
 - it is time to review the status of your previously reported visual condition.
- This form must be completed and returned by the examining optometrist to the Office of the Superintendent of Motor Vehicles within 30 days. If approval is needed prior to obtaining a driver's licence, you will be unable to obtain that licence until the completed form is submitted and approved. If this examination is required for a class of licence you already have, your driver's licence may be cancelled if you fail to have the form completed and submitted to the Superintendent by your optometrist within 30 days. If your driver's licence is cancelled, you will not be able to drive until the form is submitted and you are issued a new driver's licence.
- If your driver's licence is presently cancelled due to a visual condition, this report must be completed and returned by your optometrist before your driving privilege can be considered for reinstatement.
- If you have a visual condition that may deteriorate, you may need future visual examinations.
- The Office of the Superintendent of Motor Vehicles is billed through the Medical Services Plan (MSP) for completing this form and reimburses optometrists as follows:
 - Examination of Visual Functions only: \$ 70
 - Examination of Visual Functions and Visual Field Test at the same appointment: \$102
- Should you have questions please contact the Driver Fitness Unit, Office of the Superintendent of Motor Vehicles, Victoria at (250) 387-7747.

To the optometrist:

This Examination of Visual Functions is paid by the Office of the Superintendent of Motor Vehicles and is billed through the Medical Services Plan Billing System. If a computer-assisted visual field test is required it is also billable through MSP. Please refer to the MSP Fee Codes located at the top right corner of the first page of this document.

VISUAL FIELD TEST (VFT)

For drivers with visual field deficits, one of the following techniques should be documented and the visual field printout attached

BINOCULAR TESTING IS REQUIRED

Class 5-8 drivers require testing to 120 degrees of horizontal vision.

Class 1-4 drivers require testing to 150 degrees of horizontal vision. **Goldmann, Esterman, and Humphreys 135 are the only tests that will provide testing to 150 degrees.**

1. Goldmann III4e and V4e isopters
2. Humphrey Esterman test
3. Humphrey 81, 120, 135, or 246 point screener. If field is abnormal, set test strategy to 3 zone and all other parameters to standard. Two zone Humphrey testing is inadequate.
4. Medmont 700 Driving Field using the numeric grid format. **Studio format is NOT ACCEPTABLE.**

DRIVER'S LICENCE CLASSIFICATIONS

- Class 1 Public passenger carrying and heavy commercial vehicles
- Class 2 Large public passenger carrying vehicles
- Class 3 Heavy commercial vehicles
- Class 4 Public passenger carrying vehicles

Class 5 Passenger vehicles

Class 5 with endorsements 18 or 19 are assessed to Class 1 Standards

Class 5 with endorsement 20 is assessed to Class 3 Standards

Class 6 Motorcycles

Class 7 Learner driver's licence, passenger vehicles

Class 8 Learner driver's licence, motorcycles

21.19 Visual field test form (VFT)

VISUAL FIELD TEST

Paid for by the Office of the Superintendent of Motor Vehicles through the MSP Billing System (see form back)

OPTOMETRISTS
MSP Fee Code 96225

PERSONAL HEALTH NUMBER
(MUST BE COMPLETED)

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

The personal information on this form is collected under the authority of the *Motor Vehicle Act*, *Medicare Protection Act*, and the *Freedom of Information and Protection of Privacy Act*. The information provided will be used to determine your fitness to drive a motor vehicle and allow the physician to bill through the British Columbia Medical Services Plan for the service. Personal information is protected from unauthorized use and disclosure in accordance with the *Freedom of Information and Protection of Privacy Act* and may be disclosed only as provided by that Act. If you have any questions about the collection, use and disclosure of the information collected, contact the Office of the Superintendent of Motor Vehicles at (250) 387-7747.

THIS REPORT MUST BE COMPLETED IN FULL BY AN OPTOMETRIST AND RETURNED WITHIN 30 DAYS TO THE OFFICE OF THE SUPERINTENDENT OF MOTOR VEHICLES

| | | | |
|----------------|--|----------------|--|
| Driver's Name: | | | |
| DL#: | | Date Issued: | |
| Licence Class: | | Date of Birth: | |

Reason For This Examination: This person has been referred to determine if he/she meets the vision guidelines for the class of driver's licence indicated above.

VISUAL FIELD TEST (VFT)

For drivers with visual field deficits, one of the following techniques should be documented and the visual field printout attached

BINOCULAR TESTING IS REQUIRED

Class 5-8 drivers require testing to 120 degrees of horizontal vision.

Class 1-4 drivers require testing to 150 degrees of horizontal vision. **Goldmann, Esterman, and Humphreys 135 are the only tests that will provide testing to 150 degrees.**

1. Goldmann III4e and V4e isopters
2. Humphrey Esterman test
3. Humphrey 81, 120, 135, or 246 point screener. If field is abnormal, set test strategy to 3 zone and all other parameters to standard. Two zone Humphrey testing is inadequate.
4. Medmont 700 Driving Field using the numeric grid format. **Studio format is NOT ACCEPTABLE.**

| | |
|---|------------------------------------|
| EXAMINING OPTOMETRIST'S NAME AND ADDRESS (Use Rubber Stamp or Print) | EXAMINATION DATE |
| | (YYYY/MM/DD) |
| | SIGNATURE OF EXAMINING OPTOMETRIST |
| TELEPHONE NUMBER: | |

To the Driver:

- Under section 29 of the *Motor Vehicle Act* the Superintendent of Motor Vehicles requires you to have this form completed for one of the following reasons:
- your recently reported visual status did not provide all the information we require
- it is time to review the status of your previously reported visual condition.
- This form must be completed and returned by the examining optometrist to the Office of the Superintendent of Motor Vehicles within 30 days. If approval is needed prior to obtaining a driver's licence, you will be unable to obtain that licence until the completed form is submitted and approved. If this examination is required for a class of licence you already have, your driver's licence may be cancelled if you fail to have the form completed and submitted to the Superintendent by your optometrist within 30 days. If your driver's licence is cancelled, you will not be able to drive until the form is submitted and you are issued a new driver's licence.
- If your driver's licence is presently cancelled due to a visual condition, this report must be completed and returned by your optometrist before your driving privilege can be considered for reinstatement.
- If you have a visual condition that may deteriorate, you may need future visual examinations.
- The Office of the Superintendent of Motor Vehicles is billed through the Medical Services Plan (MSP) and reimburses optometrists \$42 for completing this form
- Should you have questions please contact the Driver Fitness Unit, Office of the Superintendent of Motor Vehicles, Victoria at (250) 387-7747.

To the optometrist:

This Visual Field Test is paid by the Office of the Superintendent of Motor Vehicles and is billed through the Medical Services Plan Billing System. Please refer to the MSP Fee Code located at the top right corner of the first page of this document.

DRIVER'S LICENCE CLASSIFICATIONS

Class 1 Public passenger carrying and heavy commercial vehicles
Class 2 Large public passenger carrying vehicles
Class 3 Heavy commercial vehicles
Class 4 Public passenger carrying vehicles

Class 5 Passenger vehicles
Class 5 with endorsements 18 or 19 are assessed to Class 1 Standards
Class 5 with endorsement 20 is assessed to Class 3 Standards
Class 6 Motorcycles
Class 7 Learner driver's licence, passenger vehicles
Class 8 Learner driver's licence, motorcycles

21.20 Recommended procedures for testing visual functions

Visual acuity

The distance visual acuity of applicants should be tested using the refractive correction (spectacles or contact lenses) that they will use for driving. The examiner should assess visual acuity under binocular (both eyes open) or monocular conditions if required by the standard. It is recommended that visual acuity be assessed using a Snellen chart or equivalent at the distance appropriate for the chart under bright photopic lighting conditions of 275 to 375 lux (or greater than 80 candelas/m²). Charts that are designed to be used at 3 meters or greater are recommended.

Visual field

When a confrontational field assessment is carried out to screen for visual field defects the following procedure is recommended as a minimum:

1. The examiner is standing or seated approximately 0.6 m (2 feet) in front of the examinee with eyes at about the same level.
2. The examiner asks the examinee to fixate on the nose of the examiner with both eyes open.
3. The examiner extends his or her arms forward, positioning the hands halfway between the examinee and the examiner. With arms fully extended, the examiner asks the examinee to confirm when a moving finger is detected.
4. The examiner should confirm that the ability to detect the moving finger is continuously present throughout the area specified in the applicable visual field standard. Testing is recommended in an area of at least 180° horizontal and 40° vertical, centred around fixation.

If a defect is detected, the individual should be referred to an ophthalmologist or optometrist for a full assessment.

When a full assessment is required, the following techniques are acceptable:

1. Goldmann III/4e and V4e isopters
2. Humphrey Esterman test
3. Humphrey 81, 120, 135, or 246 point screener. Set test strategy to single intensity or 3 zone and all other parameters to standard. Two zone Humphrey testing is inadequate.
4. Medmont 700 Driving Field
5. Other visual field techniques will be accepted if appropriate.

Please note:

- **Goldman, Esterman and Humphrey 135 are the only tests that will test 150 degrees of horizontal vision as required for professional (class 1 to 4) drivers.**
- **Binocular testing is always preferred. If a monocular test of the type noted above is available from the patient's file, it may suffice, but if the driver requires new field testing, please request binocular fields.**

Some automated testing devices used in driver testing centres have a procedure for assessing visual field. However, these tests are often insensitive to many types of visual field defects and thus may not be adequate for screening purposes.

Diplopia

Any patient reporting double vision should be referred to an ophthalmologist or optometrist for further assessment.

Contrast sensitivity

Assessment of contrast sensitivity is recommended for applicants referred to an ophthalmologist or optometrist for vision problems related to driving. Contrast sensitivity may be a more valuable indicator of visual performance in driving than Snellen acuity. The COS therefore encourages increased use of this test as a supplement to visual acuity assessment.

Contrast sensitivity can be measured by means of several commercially available instruments: the Pelli-Robson letter contrast sensitivity chart; either the 25% or the 11% Regan low-contrast acuity chart; the Bailey-Lovie low-contrast acuity chart or the VisTech contrast sensitivity test. The testing procedures and conditions recommended for the specific test used should be followed.

Depth perception

There are no clinical tests available for assessing depth perception other than those used for stereopsis. If stereopsis assessment is required, the Titmus test can be used.

Dark adaptation and glare recovery

Currently there are no standardized tests or procedures that can be recommended for assessing these functions.

Chapter 22: Syncope

BACKGROUND

22.1 About syncope

Syncope refers to a partial or complete loss of consciousness, usually resulting from a temporary reduction in blood flow to the brain. The onset of syncope is relatively rapid and recovery is generally prompt, spontaneous and complete. The non-medical term for syncope is fainting.

Syncope has many different causes, including cardiovascular disease and neurological disorders. In some cases, no underlying cause can be found.

The following are the major types of syncope:

- vasovagal syncope
- postural syncope, and
- cardiac syncope.

The most common types of syncope are vasovagal (neurocardiogenic) and cardiac syncope.

Vasovagal syncope

Vasovagal or neurocardiogenic syncope refers to syncope that is triggered by an exaggerated and inappropriate nervous system response to a particular stimulus. The response is characterized by alterations in heart rate and blood flow, with a subsequent reduction in blood pressure. The stimulus can be any of a wide range of events such as:

- dehydration
- intense emotional stress
- anxiety
- fear
- pain
- hunger, or
- the use of alcohol or drugs.

Stimuli can also include forceful coughing, turning of the neck or wearing a tight collar (carotid sinus hypersensitivity), or urinating (micturition syncope).

Postural syncope

Postural syncope is syncope that results from a sudden drop in blood pressure immediately after standing or sitting up. It can be a side-effect of some medications or may be caused by dehydration or medical conditions such as Parkinson's disease.

Cardiac syncope

Cardiac syncope refers to syncope caused by cardiac conditions such as:

- valvular heart disease
- chronic heart failure, or
- arrhythmias (bradycardias or tachycardias).

Cardiac arrhythmias are the most common cause of cardiac syncope.

22.2 Prevalence and incidence of syncope

The prevalence of syncope is difficult to determine. One study reported that 3% of males and 3.5% of females had at least one episode of syncope over a 26 year period. The Canadian Cardiovascular Society estimates that syncope may affect as many as 50% of Canadians at some point during their life. Higher rates of syncope are reported in older individuals.

22.3 Syncope and adverse driving outcomes

Few studies have considered the relationship between syncope and driving. Of those that have, most indicate a relationship between syncope and impaired driving performance for at least some groups that experience syncope.

22.4 Effect of syncope on functional ability to drive

Syncope causes an episodic impairment of all the functions necessary for driving.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|-----------|---|-------------------------------------|--|
| Syncope | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation | Driver's Medical Examination Report Specialist's report |

22.5 Compensation

As syncope causes an episodic impairment of the functions necessary for driving, compensation does not apply.

GUIDELINES

The following table indicates the guidelines applicable to the various types of syncope that may be experienced by private and commercial drivers.

| Type of syncope | | Guidelines for private drivers | Guidelines for commercial drivers |
|-----------------|--|--------------------------------|-----------------------------------|
| Single episode | Typical vasovagal | 22.7 | 22.11 |
| | Unexplained | 22.7 | 22.14 |
| | Atypical vasovagal | 22.7 | 22.14 |
| Recurrent | Reversible, diagnosed or treated cause | 22.8 | 22.12 |
| | Typical vasovagal | 22.9 | 22.14 |
| | Situational | 22.9 | 22.13 |
| | Unexplained | 22.10 | 22.14 |
| | Atypical vasovagal | 22.10 | 22.14 |

22.6 Policy rationale

These guidelines are based primarily on recommendations contained in the final report of the 2003 Canadian Cardiovascular Society (CCS) Consensus Conference Assessment of the Cardiac Patient for Fitness to Drive and Fly. When applying these guidelines, the CCS indicates that waiting periods may be modified based on individual factors such as length of any reliable warning symptoms (prodrome), reversible or avoidable precipitating factors, and position from which the individual experiences syncope.

22.7 Private drivers who have had a single episode of syncope

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have had a single episode of:</p> <ul style="list-style-type: none"> • typical vasovagal syncope • unexplained syncope, or • atypical vasovagal syncope. <p>Typical vasovagal syncope is a vasovagal syncope that occurs when standing and is preceded by warning signs that are sufficient to allow a driver to pull off the road before losing consciousness.</p> <p>Atypical vasovagal syncope is a vasovagal syncope that occurs in the sitting position or is not preceded by warning signs that are sufficient to allow a driver to pull off the road before losing consciousness.</p> |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | <p>Individuals who have a single episode of typical vasovagal syncope may drive.</p> <p>Individuals who have a single episode of unexplained syncope or atypical vasovagal syncope may drive if it has been at least 1 week since their last episode of syncope.</p> |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | <p>The OSMV will impose the following condition on an individual who has had a single episode of unexplained or atypical vasovagal syncope who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have another episode of syncope. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment is required after an episode of typical vasovagal syncope. If an episode of unexplained syncope or atypical vasovagal syncope occurred within the past 12 months, the OSMV will reassess in one year. If no further episodes are reported at that time, no further reassessment, other than routine age-related reassessment is required. |

22.8 Private drivers with syncope with a treated or reversible cause

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have:</p> <ul style="list-style-type: none"> • syncope with a reversible cause, or • syncope with a diagnosed and treated cause (e.g., pacemaker for bradycardia). |
| Assessment guidelines | The OSMV will not generally request further information. |
| | <p>Individuals who experience syncope with a reversible cause may drive if the cause has been successfully treated.</p> <p>Individuals with syncope where the cause has been diagnosed and treated may drive if it has been at least 1 week since successful treatment.</p> |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if the cause of the syncope has been successfully treated. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have another episode of syncope. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine age-related reassessment is required, unless reassessment is required because of the underlying medical condition or treatment. |

22.9 Private drivers with recurrent typical vasovagal syncope or situational syncope

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have had two or more episodes of :</p> <ul style="list-style-type: none"> • typical vasovagal syncope, or • situational syncope with an avoidable trigger (e.g., micturition syncope, defecation syncope) <p>within a 12 month period.</p> |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | <p>Individuals who experience recurrent situational syncope with an avoidable trigger may drive if it has been at least 1 week since their last episode of syncope.</p> <p>Individuals who have recurrent episodes of vasovagal syncope may drive if it has been at least 1 week since their last episode of syncope.</p> |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>No reassessment, other than routine age-related reassessment is required for individuals with situational syncope.</p> <p>For individuals with recurrent typical vasovagal syncope, the OSMV will reassess in one year. If no further episodes of syncope are reported at that time, no further reassessment is required, other than routine age-related reassessment.</p> |

22.10 Private drivers with recurrent atypical vasovagal syncope or unexplained syncope

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have had two or more episodes of :</p> <ul style="list-style-type: none"> • atypical vasovagal syncope, or • unexplained syncope within a 12 month period. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. |
| Fitness guidelines | Individuals may drive if it has been at least 3 months since their last episode of syncope. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if it has been at least 3 months since their last episode of syncope. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have another episode of syncope. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. If no further episodes of syncope are reported at that time, no further reassessment is required, other than routine age-related reassessment. |

22.11 Commercial drivers who have had a single episode of typical vasovagal syncope

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have had a single episode of typical vasovagal syncope within a 12 month period.</p> <p>Typical vasovagal syncope is a vasovagal syncope that occurs when standing and is preceded by warning signs that are sufficient to allow a driver to pull off the road before losing consciousness.</p> |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | No restrictions. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have another episode of syncope. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial reassessment, is required. |

22.12 Commercial drivers with syncope with a treated or reversible cause

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have:</p> <ul style="list-style-type: none"> • syncope with a reversible cause, or • syncope with a diagnosed and treated cause (e.g., pacemaker for bradycardia). |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | <p>Individuals who experience syncope with a reversible cause may drive if the cause has been successfully treated.</p> <p>Individuals with syncope where the cause has been diagnosed and treated may drive if it has been at least 1 month since successful treatment.</p> |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if the cause of the syncope has been successfully treated. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must report to the OSMV and your physician if you have another episode of syncope. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial reassessment is required, unless reassessment is required because of the underlying medical condition or treatment. |

22.13 Commercial drivers with recurrent situational syncope

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who have had two or more episodes of situational syncope with an avoidable trigger (e.g., micturition syncope, defecation syncope) within a 12 month period. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may drive if it has been at least 1 week since their last episode of syncope. |
| OSMV determination guidelines | Individuals are fit to drive. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial reassessment, is required. |

22.14 Commercial drivers with atypical vasovagal syncope, unexplained syncope or recurrent typical vasovagal syncope

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have had:</p> <ul style="list-style-type: none"> • single or recurrent atypical vasovagal syncope • single or recurrent unexplained syncope, or • recurrent typical vasovagal syncope within a 12 month period. <p>Typical vasovagal syncope is a vasovagal syncope that occurs when standing and is preceded by warning signs that are sufficient to allow a driver to pull off the road before losing consciousness.</p> <p>Atypical vasovagal syncope is a vasovagal syncope that occurs in the sitting position or is not preceded by warning signs that are sufficient to allow a driver to pull off the road before losing consciousness.</p> |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician. |
| Fitness guidelines | Individuals may drive if it has been at least 12 months since their last episode of syncope. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if it has been at least 12 months since their last episode of syncope. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of syncope, and • you must report to the OSMV and your physician if you have another episode of syncope. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. If no further episodes of syncope are reported at that time, no further reassessment is required, other than routine commercial reassessment. |

Chapter 23: Seizures and Epilepsy

BACKGROUND

23.1 About seizures and epilepsy

Seizures

A seizure is caused by a sudden electrical discharge in the brain. A seizure does not always mean that a person falls to the ground in convulsions. It can be manifested in various ways, including:

- feelings of being absent
- visual distortions
- nausea
- vertigo
- tingling
- twitching
- shaking
- rigidity of parts of the body or the entire body, or
- an alteration or loss of consciousness.

Seizures may occur in people who do not have epilepsy. These non-epileptic seizures are often referred to as provoked seizures. Some are caused by transient factors with no structural brain abnormality such as:

- fever
- low blood sugar
- electrolyte imbalance
- head trauma
- meningitis
- simple fainting, and
- alcohol or drug toxicity or withdrawal.

Others are caused by conditions where there is a structural brain abnormality such as a:

- tumour
- stroke
- aneurysm, or
- hematoma.

Provoked seizures are not epilepsy, and they resolve after the provoking factor has resolved or stabilized.

Sometimes people appear to have seizures, even though their brains show no seizure activity. This phenomenon is called a non-epileptic psychogenic seizure (NEPS), sometimes referred to as

a pseudoseizure, and is psychological in origin. Some people with epilepsy have NEPS in addition to their epileptic seizures. Other people who have NEPS do not have epilepsy at all.

Epilepsy

Epilepsy refers to a condition characterized by recurrent (at least two) seizures, which do not have a transient provoking cause. The cause of the epileptic seizures may be known or unknown (idiopathic). About two-thirds of epilepsy in young adults is idiopathic, but more than half of epilepsy in those 65 and older has a known cause. Known causes of epilepsy include permanent structural brain abnormality such as scarring from:

- stroke
- prior surgery
- head injury
- infections
- tumours
- aneurysms, or
- arteriovenous malformations.

Types of seizures

Seizures are divided into two main categories: partial (also called focal or local) seizures and generalized seizures. A partial seizure is a seizure that arises from an electrical discharge in one part of the brain. A generalized seizure is caused by discharges throughout the brain.

Partial seizures

There are three types of partial seizures:

- simple partial seizures
- complex partial seizures, and
- partial seizures (simple or complex) that evolve into secondary generalized seizures (see below).

The difference between simple and complex seizures is that individuals experiencing simple partial seizures retain awareness during the seizure, whereas those experiencing complex partial seizures lose awareness during the seizure.

Symptoms of partial seizures depend on which part of the brain is affected. They may include one or more of the following:

- head turning
- eye movements
- mouth movements
- lip smacking
- drooling
- apparently purposeful movements
- rhythmic muscle contractions in a part of the body

- abnormal numbness
- tingling and a crawling sensation over the skin
- sensory disturbances such as smelling or hearing things that are not there, or
- having a sudden flood of emotions.

Individuals who have partial seizures, especially complex partial seizures, may experience an aura, i.e. unusual sensations that warn of an impending seizure. An aura is actually a simple partial seizure. The aura symptoms an individual experiences and the progression of those symptoms tend to be similar every time.

Generalized seizures

Types of generalized seizures and their symptoms are listed in the table below.

| Type of Generalized Seizure | Symptoms |
|------------------------------------|---|
| Absence | Brief loss of consciousness |
| Myoclonic | Sporadic (isolated), jerking movements |
| Clonic | Repetitive, jerking movements |
| Tonic | Muscle stiffness, rigidity |
| Tonic-clonic or 'grand mal' | Unconsciousness, convulsions, muscle rigidity |
| Atonic | Loss of muscle tone |

Most common seizures

The three most common types of seizures in adults are:

- generalized tonic-clonic or grand mal seizures
- complex partial seizures, and
- simple partial seizures.

Approximately one-third of all individuals with epilepsy have complex partial seizures, with the prevalence increasing to one-half in those with epilepsy who are 65 and older.

Recurrence of seizures

The estimated risk of a recurrence after an initial unprovoked seizure ranges from 23% to 71%, with the average risk of recurrence for adults being 43%. If the seizure is idiopathic (i.e. the cause is unknown) and the individual's electroencephalogram (EEG) is normal, the risk of recurrence is reduced. Individuals who experience a partial seizure and have an abnormal EEG or other neurological abnormality, have an increased risk for seizure recurrence. A family history of epilepsy also increases the risk of recurrence.

Treatment for seizures and epilepsy

Seizure patterns in individuals with epilepsy may change over time, and seizures may eventually stop. Epilepsy is generally treated with anticonvulsant drugs (anti-epileptics) and is sometimes treated with surgery to remove the source of epilepsy from the brain. Recent studies indicate that

more than half of newly diagnosed individuals with epilepsy can achieve seizure control with anti-epileptic drugs. Many of those who achieve seizure control are eventually able to stop taking anti-epileptic drugs and remain seizure-free. However, the relapse rate with drug withdrawal is at least 30 to 40%. For a further discussion of the impact of anti-epileptics on driving, see Chapter 29 – Psychotropic Drugs.

23.2 Prevalence and incidence of seizures and epilepsy

Research indicates that up to 9% of the general population will have at least one seizure. Epilepsy has an overall prevalence rate of 0.6% in Canada, with an estimated incidence of 15,500 new cases per year (2003). The table below shows the prevalence of epilepsy in Canada by age.¹⁵

| Age (years) | Prevalence (%) | Age (years) | Prevalence (%) |
|-------------|----------------|-------------|----------------|
| 0 – 11 | 0.3 | 25 – 44 | 0.7 |
| 12 – 14 | 0.6 | 46 – 64 | 0.7 |
| 16 – 24 | 0.6 | > 65 | 0.7 |

23.3 Seizures and epilepsy and adverse driving outcomes

Research indicates that, in general, individuals with epilepsy have an increased risk for adverse driving outcomes. Variability in the methodology and study results makes it difficult to determine the extent of the increased risk.

Studies of crash rates indicate that the following factors increase the risk of crash for those with epilepsy:

- age – younger drivers have increased risk, particularly those under 25
- marital status – unmarried drivers are at a greater risk than married drivers, and
- treatment – those not receiving anti-epileptic drug treatment are at greater risk than those receiving treatment.

23.4 Effect of seizures and epilepsy on functional ability to drive

The primary consideration for drivers with epilepsy is the potential for a seizure causing a sudden impairment of cognitive, motor or sensory functions, or a loss of consciousness while driving.

¹⁵ Source: Data from Ontario Health Survey, Community Health Survey and National Population Health Survey (Wiebe S, Bellhouse D, Fallary C, Eliasziw M. Burden of epilepsy: the Ontario health survey. Can J Neurol Sci 1999;26:263-70).

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|----------------------|---|-------------------------------------|--|
| Seizures Epilepsy | Episodic impairment: Medical assessment – likelihood of impairment | Variable – sudden impairment | Driver's Medical Examination Report Specialist's report |

23.5 Compensation

As seizures and epilepsy cause an episodic impairment of the functions necessary for driving, an individual can not compensate.

GUIDELINES

23.6 Policy rationale

The general approach of the guidelines for drivers with epilepsy or who experience seizures is that seizures must be controlled as a prerequisite to driving.

Most of the guidelines include a requirement for a seizure-free period. The purpose of this requirement for a provoked seizure is to establish the likelihood that the provoking factor has been successfully treated or stabilized. For an unprovoked seizure, the purpose is to allow time to assess the cause, and where epilepsy is diagnosed to establish the likelihood that

- a therapeutic drug level has been achieved and maintained
- the drug being used will prevent further seizures, and
- there are no side effects that may affect the individual's ability to drive safely.

The guidelines identify exceptions to the requirement to remain seizure free for drivers of private vehicles who have epilepsy and who have only simple partial seizures, or seizures that only occur while they are asleep or immediately upon awakening.

23.7 Private and commercial drivers with provoked seizures caused by a structural brain abnormality

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have experienced provoked seizures caused by a structural brain abnormality such as:</p> <ul style="list-style-type: none"> • a brain tumour • stroke • subdural hematoma, or • aneurysm. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • a neurological assessment. The neurological assessment may be conducted by the treating physician, if the physician has treated the patient for two years or more. However, if a neurological assessment by the treating physician does not provide the required information, the OSMV may request an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed • it has been 6 months since the provoking factor stabilized, resolved, or been corrected, with or without treatment, and they have not had a seizure during that time • they have been taking anti-epileptic medication for 3 months or have been off anti-epileptic medication for 3 months, and • the treating physician indicates that further seizures are unlikely. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed • it has been 6 months since the provoking factor stabilized, resolved, or been corrected, with or without treatment, and they have not had a seizure during that time • they have been taking anti-epileptic medication for 3 months or have been off anti-epileptic medication for 3 months, and • the treating physician indicates that further seizures are unlikely |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If the seizure occurred within the past 12 months, the OSMV will reassess in one year. If no further seizures are reported at that time, or if the seizure occurred more than one year ago, the OSMV will</p> |

| | |
|--|--|
| | reassess in five years. If no further seizures are reported at that time, no further reassessment, other than routine commercial or age-related reassessment, is required. |
|--|--|

23.8 Private and commercial drivers with provoked seizures with no structural brain abnormality

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have experienced provoked seizures caused by:</p> <ul style="list-style-type: none"> • a toxic illness • adverse drug reaction • a trauma, or • other cause that is not associated with a structural brain abnormality. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • a neurological assessment. The neurological assessment may be conducted by the treating physician, if the physician has treated the patient for two years or more. However, if a neurological assessment by the treating physician does not provide the required information, the OSMV may request an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed • the provoking factor has stabilized, resolved, or been corrected, with or without treatment, and • the treating physician indicates that further seizures are unlikely. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed • the provoking factor has stabilized, resolved, or been corrected, with or without treatment, and • the treating physician indicates that further seizures are unlikely. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine commercial or age-related reassessment, is required. |

23.9 Private and commercial drivers with alcohol-related provoked seizures

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|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers with alcohol-related provoked seizures. |
| Assessment guidelines | If further information is required, the OSMV will request an assessment from an addictions specialist or the treating physician, if the treating physician has treated the individual for more than two years. |
| Fitness guidelines | Individuals may drive if: <ul style="list-style-type: none"> • the treating physician has confirmed that the cause of the seizure was alcohol use • they have undergone addiction treatment and have received a favourable report from an addiction counsellor, and • it has been at least 6 months since they have used alcohol or had a seizure. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • the treating physician has confirmed that the cause of the seizure was alcohol use • they have undergone addiction treatment and have received a favourable report from an addiction counsellor, and • it has been at least 6 months since they have used alcohol or had a seizure. |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must follow up regularly with your treating physician and comply with any prescribed treatment regime, and • you must cease driving and report to the OSMV and your physician if you have a seizure |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. If no further seizures are reported at that time, the OSMV will reassess in five years. If no further seizures are reported at that time, no further reassessment, other than routine commercial or age-related reassessment, is required. |

23.10 Private drivers with single unprovoked seizures

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|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private drivers who have experienced a single unprovoked seizure. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • a neurological assessment. The neurological assessment may be conducted by the treating physician, if the physician has treated the patient for two years or more. However, if a neurological assessment by the treating physician does not provide the required information, the OSMV may request an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since the seizure occurred, and • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed. Neurological assessment means an assessment conducted by a neurologist or other medical specialist who has determined, based on history, physical examination and appropriate diagnostic tests, that epilepsy is not diagnosed. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 3 months since the seizure occurred, and • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed. Neurological assessment means an assessment conducted by a neurologist or other medical specialist who has determined, based on history, physical examination and appropriate diagnostic tests, that epilepsy is not diagnosed. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If the seizure occurred within the past 12 months, the OSMV will reassess in one year. If no further seizures are reported at that time, or if the seizure did not occur within the past 12 months, the OSMV will reassess in five years. If no further seizures are reported at that time, no further reassessment, other than routine age-related reassessment, is required. |

23.11 Commercial drivers with single unprovoked seizures

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have experienced a single unprovoked seizure. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • a neurological assessment. The neurological assessment may be conducted by the treating physician, if the physician has treated the patient for two years or more. However, if a neurological assessment by the treating physician does not provide the required information, the OSMV may request an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • it has been at least 12 months since the seizure occurred, and • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed. Neurological assessment means an assessment conducted by a neurologist or other medical specialist who has determined, based on history, physical examination and appropriate diagnostic tests, that epilepsy is not diagnosed. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • it has been at least 12 months since the seizure occurred, and • they have undergone a neurological assessment to determine the cause of the seizure, and epilepsy is not diagnosed. Neurological assessment means an assessment conducted by a neurologist or other medical specialist who has determined, based on history, physical examination and appropriate diagnostic tests, that epilepsy is not diagnosed. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in one year. If no further seizures are reported at that time, the OSMV will reassess in accordance with routine commercial reassessment. |

23.12 Private drivers with epilepsy

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for private drivers who have been diagnosed with epilepsy, with the following exceptions:</p> <ul style="list-style-type: none"> • If the epileptic seizures only occur while the driver is asleep, or immediately after awakening, the guidelines under 23.13 apply. • If the driver only experiences simple partial seizures, the guidelines under 23.14 apply. • If the driver has had surgery for epilepsy, the guidelines under 23.15 apply. • If the driver has changed effective medication, the guidelines under 23.16 apply. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have been taking anti-epileptic medication for 6 months, or a longer period where recommended by their treating physician, and have not had a seizure during that time, and • they routinely follow their treatment regime and physician's advice regarding prevention of seizures. |
| OSMV determination guidelines | <p>The OSMV will find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have been taking anti-epileptic medication for 6 months, or a longer period where recommended by their treating physician, and have not had a seizure during that time, and • they routinely follow their treatment regime and physician's advice regarding prevention of seizures. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures, and • you must cease driving and report to the OSMV and your physician if you have a seizure |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>If a seizure occurred within the past 12 months, the OSMV will reassess in one year. If no further seizures are reported at that time, or if a seizure did not occur within the past 12 months, no reassessment, other than routine age-related reassessment, is required.</p> |

23.13 Private drivers who have epileptic seizures while asleep or upon awakening

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who have epileptic seizures only while the driver is asleep, or immediately after awakening. |
| Assessment guidelines | If further information is required, the OSMV will request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | Individuals may drive if: <ul style="list-style-type: none"> • the seizure pattern has been consistent for at least 5 years, unless a neurologist recommends a shorter period accompanied by close observation by the neurologist • where they are treated, they routinely follow their treatment regime and physician's advice regarding prevention of seizures, and • they routinely follow their physician's advice regarding continued monitoring of their seizures. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • the seizure pattern has been consistent for at least 5 years, unless a neurologist recommends a shorter period accompanied by close observation by the neurologist • where they are treated, they routinely follow their treatment regime and physician's advice regarding prevention of seizures, and • they routinely follow their physician's advice regarding continued monitoring of their seizures. |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures • you must routinely follow your physician's advice regarding continued monitoring of your seizures. • you must report to the OSMV and your physician if the pattern of your seizures changes |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment, other than routine age-related reassessment, is required. |

23.14 Private drivers with epilepsy who experience simple partial seizures

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers with epilepsy who only experience simple partial seizures (no impairment in level of consciousness), the symptoms of which do not impair their functional ability to drive. |
| Assessment guidelines | If further information is required, the OSMV will request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | Individuals may drive if: <ul style="list-style-type: none"> • the symptoms of the seizures are unchanged for at least 1 year • where they are treated, they routinely follow their treatment regime and physician's advice regarding prevention of seizures, and • they have the support of a neurologist to drive. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • the symptoms of the seizures are unchanged for at least 1 year • where they are treated, they routinely follow their treatment regime and physician's advice regarding prevention of seizures, and • they have the support of a neurologist to drive. |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures • you must report to the OSMV and your physician if the symptoms of your seizures change |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | No reassessment is required, other than routine age-related reassessment. |

23.15 Private drivers who have had surgery for epilepsy

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private drivers who have had surgery for epilepsy. |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have not had a seizure for 6 months • they routinely follow their treatment regime and physician's advice regarding prevention of seizures, and • where they have a subsequent seizure, they stop driving for at least 6 months or a longer period where recommended by their treating physician and do not have a seizure during that time. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have not had a seizure for 6 months • they routinely follow their treatment regime and physician's advice regarding prevention of seizures, and • where they have a subsequent seizure, they stop driving for at least 6 months or a longer period where recommended by their treating physician and do not have a seizure during that time. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures, and • you must cease driving and report to the OSMV and your physician if you have a seizure |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in five years. If no seizures are reported at that time, no further reassessment, other than routine age-related reassessment, is required. |

23.16 Private drivers with epilepsy who change medication

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private drivers with epilepsy who undergo a prescribed change to or withdrawal of an effective antiepileptic medication. These guidelines only apply where the individual's treatment was effective (i.e., their epilepsy was controlled) prior to the change to or withdrawal from medication. This means they should not have had a seizure for at least six months prior to the change or withdrawal of medication. If their treatment prior to the change was not effective, then the guidelines for private drivers with epilepsy outlined in 23.12 apply. |
| Assessment guidelines | If further information is required, the OSMV will request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | Individuals may drive if it has been 3 months since the change or withdrawal and they have not had a seizure during that time. Individuals who have a seizure after a change to, or withdrawal from, epileptic medication may be found fit to drive if: <ul style="list-style-type: none"> • they re-establish a previously effective treatment regime, and • the treating physician indicates that further seizures are unlikely. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • it has been 3 months since the change or withdrawal and they have not had a seizure during that time. Individuals who have a seizure after a change to, or withdrawal from, epileptic medication may be found fit to drive if: <ul style="list-style-type: none"> • they re-establish a previously effective treatment regime, and • the treating physician indicates that further seizures are unlikely |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures, and • you must cease driving and report to the OSMV and your physician if you have a seizure. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | If a seizure occurred within the past 12 months, the OSMV will reassess in one year. If no further seizures are reported at that time, or if a seizure did not occur within the past 12 months, the OSMV will reassess in five years. If no further seizures are reported at that time, no further reassessment, other than routine age-related reassessment, is required. |

23.17 Commercial drivers with epilepsy

| | |
|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for commercial drivers who have been diagnosed with epilepsy. This includes commercial drivers:</p> <ul style="list-style-type: none"> • who have had surgery for epilepsy • whose seizures only occur while they are asleep or immediately after awakening, and. • who have only simple partial seizures (no impairment in level of consciousness), the symptoms of which do not impair their functional ability to drive . <p>See 23.18 for guidelines applicable to commercial drivers who meet these guidelines and then change medication.</p> |
| Assessment guidelines | <p>If further information is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have been taking anti-epileptic medication continuously for 5 years and have not had a seizure during that time, or they have not taken anti-epileptic medication for 5 continuous years and have not had a seizure during that time, and • they routinely follow their treatment regime and physician's advice regarding prevention of seizures. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have been taking antiepileptic medication continuously for 5 years and have not had a seizure during that time, or • they have not taken antiepileptic medication for 5 continuous years and have not had a seizure during that time, and • they routinely follow their treatment regime and physician's advice regarding prevention of seizures. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures, and • you must cease driving and report to the OSMV and your physician if you have a seizure. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with the schedule for routine commercial reassessment. |

23.18 Commercial drivers with epilepsy who change medication

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers with epilepsy who have a prescribed change to, or withdrawal of, an effective antiepileptic medication. These guidelines only apply where the individual's treatment was effective (i.e., their epilepsy was controlled) prior to the change to or withdrawal from medication. This means they must first meet the regular guidelines for drivers with epilepsy before this guideline will apply. |
| Assessment guidelines | If further information is required, the OSMV will request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. |
| Fitness guidelines | Individuals may drive if it has been 5 years since the change or withdrawal and they have not had a seizure during that time. Individuals who meet the guideline above but subsequently have a seizure may drive if: <ul style="list-style-type: none"> • they have re-established a previously effective treatment regime for 6 months and they have not had a seizure during that time, and • the treating physician indicates that further seizures are unlikely. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if: <ul style="list-style-type: none"> • it has been 5 years since the change or withdrawal and they have not had a seizure during that time Individuals who meet the guideline above but subsequently have a seizure may drive if: <ul style="list-style-type: none"> • they have re-established a previously effective treatment regime for 6 months and they have not had a seizure during that time, and • the treating physician indicates that further seizures are unlikely. |
| Conditions | The OSMV will impose the following conditions on an individual who is found fit to drive: <ul style="list-style-type: none"> • you must routinely follow your treatment regime and physician's advice regarding prevention of seizures, and • you must cease driving and report to the OSMV and your physician if you have a seizure. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess in accordance with the schedule for routine commercial reassessment. |

Chapter 24: Neurological disorders

BACKGROUND

24.1 About neurological disorders

Neurological disorders can affect the brain, spinal cord, nerves and muscles. They can affect an individual's ability to think, see, communicate, move, and sense and coordinate movements. While any number of conditions fall within the category of neurological disorders, this chapter focuses on three common disorders: multiple sclerosis, Parkinson's disease, and cerebral palsy.

Multiple sclerosis

Multiple sclerosis (MS) is believed to be an autoimmune disorder in which the immune system attacks specific structures of the central nervous system (brain and spinal cord), resulting in inflammation, demyelination, and axonal damage. Myelin is an essential insulation sheath of the nerve processes (axons). If it is damaged, signal transmission is slowed. Demyelination can ultimately result in permanent axonal damage in the form of scars and is called gliosis. MS has an unpredictable and chronic course, leading to numerous physical and cognitive impairments. The cause is unknown. There are four clinical types of MS:

- Relapsing – Remitting (RRMS)
- Secondary Progressive (SPMS)
- Primary Progressive (PPMS), and
- Progressive Relapsing (PRMS).

Relapsing – Remitting (RRMS)

It is estimated that 55% of individuals with MS have RRMS. It is characterized by unpredictable attacks (relapses) followed by periods of months to years with no new clinical signs of disease activity (remissions). Impairments suffered during relapses may either resolve or become permanent. Approximately 10% of those with RRMS have “benign MS”, where impairments usually completely resolve between relapses and no disability is present after 10 years of disease onset. The longer a person has MS, the greater the probability that the relapses will not completely resolve and they will experience increasing disability.

RRMS accounts for over 90% of initial diagnoses of MS, but in many cases a different type emerges as the disease progresses. Approximately 50% of individuals with RRMS will eventually progress to Secondary Progressive MS within 10 years of disease onset.

Secondary Progressive (SPMS)

It is estimated that 30% of individuals with MS have SPMS. It is characterized by an initial presentation as RRMS, transitioning to a gradual progression of disability with or without superimposed relapses and minor remissions. Relapses may include new neurologic symptoms

or worsening of existing symptoms. Of all the types of MS, SPMS causes the greatest amount of disability.

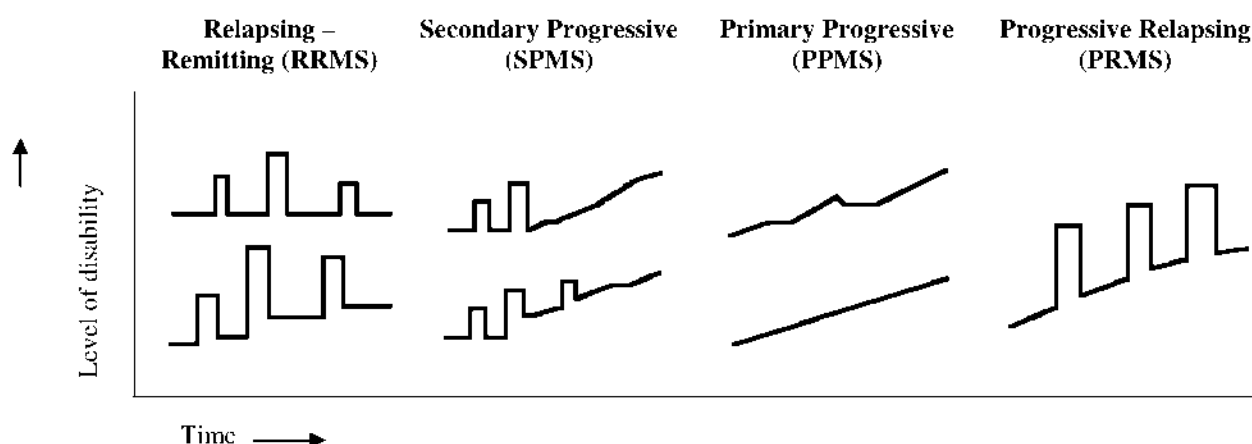
Primary Progressive (PPMS)

It is estimated that 10% of individuals with MS have PPMS. It is characterized by a gradual progression of disability with no relapses and minor remissions from onset. The spinal cord is the area of the central nervous system primarily affected; therefore, cognitive impairments are unusual.

Progressive Relapsing (PRMS)

It is estimated that 3 to 5% of individuals with MS have PRMS. PRMS is characterized by a steady progression of disability with superimposed relapses and remissions. There may be significant recovery immediately following a relapse, but between relapses there is a gradual worsening of symptoms.

The following illustration compares the course of disability over time for each of the four types of MS.¹⁶



Parkinson's disease

Parkinson's disease (PD) belongs to a group of conditions called motor system or movement disorders, which result from the slowly progressive loss of dopamine-producing brain cells. The lack of dopamine, a neurotransmitter, interferes with the transmission of messages from the brain to nerve cells that control muscle movement and coordination. It can result in motor impairment (tremor or rigidity) and in later stages in cognitive or autonomic dysfunction. PD is chronic and

¹⁶ Source: The Multiple Sclerosis Information Trust, <http://www.multiple-sclerosis.org>.

progressive, and while the specific cause is unknown, it is believed that both genetic and environmental factors contribute to the development of the disease.

Cerebral palsy

Cerebral palsy refers to any one of a number of neurological disorders that appear in infancy or early childhood and is the result of damage to, or impaired development of, the motor centres of the brain. It is a non-progressive disorder that permanently affects body movement and muscle coordination.

24.2 Prevalence and incidence of neurological disorders

Multiple sclerosis

The prevalence of MS in Canada is among the highest in the world, with studies reporting prevalence rates from 55 to 240 per 100,000. A recent study using data from the 2001 Canadian Community Health Survey reported an overall weighted estimate of 240 per 100,000 adults (0.24%).¹⁷

MS is twice as likely to affect women as men, with the highest incidence occurring in individuals in their late 30's, and the highest prevalence among those in their 40's and 50's.

Parkinson's disease

Estimated prevalence rates for Parkinson's disease vary widely depending on the population sampled and the methodology used. Age-adjusted prevalence rates in Canada have been reported as 125 per 100,000 (1.25%).

Cerebral palsy

The prevalence of cerebral palsy (CP) in Canadian infants is approximately 2 in 1000, with over 50,000 Canadians currently living with the disorder. The number of individuals with CP has risen slightly over the past 30 years due to higher survival rates of affected newborns as care and treatment have improved.

24.3 Neurological disorders and adverse driving outcomes

Multiple sclerosis

The research on MS and driving is limited. The results of this research indicate that driving performance may be impaired by functional deficits, including cognitive impairment, caused by MS.

¹⁷ Weighted estimate means that the results from the data are adjusted (weighted) from the sampling design using national population data.

Parkinson's disease

There is a small but consistent body of research indicating that functional deficits associated with Parkinson's disease or its treatment may impair driving performance.

Cerebral palsy

There has been no research on the effects of cerebral palsy and driving outcomes.

24.4 Effect of neurological disorders on functional ability to drive

Multiple sclerosis

MS can affect motor, visual, and cognitive functioning. The major symptoms associated with MS that may affect driving are:

- ataxia (wobbliness, incoordination and unsteadiness)
- impaired proprioception (ability to perceive the body's position in space)
- spasticity (involuntary muscle spasms)
- muscle weakness
- fatigue
- chronic pain
- vision problems, and
- cognitive impairment.

Vision problems are common, affecting up to 80% of individuals with MS at some point. Visual symptoms associated with MS include:

- nystagmus (rapid, involuntary eye movement)
- diplopia (double vision)
- blurred vision
- scotoma (abnormal blind spot), and
- diminished contrast sensitivity.

Cognitive impairment, particularly associated with information processing speed, is also common, affecting between 45 and 65% of those with the disease.

Medications used to treat MS that may affect driving include:

- corticosteroids
- NSAIDS
- anti-epileptics
- anti-depressants
- anti-spasticity drugs, and
- opioids.

See Chapter 29, Psychotropic Drugs, for more information on these medications.

Parkinson's disease

PD can affect motor, visual, and cognitive functioning. Common motor symptoms include:

- tremor
- rigidity
- bradykinesia/akinesia (slowness or absence of movement/rapid repetitive movements), and
- postural instability.

Visual impairments such as contrast sensitivity, diplopia (double-vision) and impaired eye movement are sometimes seen in PD and related movement disorders. Cognitive symptoms may include psychiatric conditions such as depression, impulse control disorders, and psychosis, as well as sleep disturbances, psychomotor slowing (slow response and reaction time), cognitive impairment and dementia.

In addition to the symptoms noted above, fatigue and sleep disturbances are common in those with PD.

The symptoms of PD are often treated with medications including levodopa, dopamine agonists, and MAO-B inhibitors. These medications can cause side effects including sleepiness, sleep attacks (sudden, overwhelming sleepiness with little or no warning signs) and visual hallucinations, which may affect driving.

A further consideration for driving is the fluctuation in the effects of medication. Individuals with advanced PD may experience periods of reduced symptom control (wearing off) near the time of their next dose of medication.

Cerebral palsy

CP can affect motor, visual, and cognitive functioning. The primary effects of CP are:

- ataxia (wobbliness, incoordination and unsteadiness)
- weakness and spasticity (involuntary muscle spasms), and
- altered muscle tone that is either too stiff or too floppy.

CP can also cause a loss of visual acuity or slowed visual tracking, as well as cognitive impairments such as impaired judgment and slow processing or reaction times.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|---|---|--|---|
| Multiple sclerosis Parkinson's disease Cerebral palsy | Persistent impairment: Functional assessment | Variable – cognitive, motor or sensory | Driver's Medical Examination Report Specialist's report ICBC road test SIMARD-MD DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |

24.5 Compensation

Individuals who have experienced a persistent impairment of motor or sensory function may be able to compensate. An occupational therapist, driver rehabilitation specialist, driver examiner or other medical professional may recommend specific compensatory vehicle modifications or restrictions based on an individual functional assessment.

Some examples of compensatory mechanisms are shown in the following table.

| Motor impairment | Sensory (vision) impairment |
|---|--|
| <ul style="list-style-type: none"> Steering wheel spinner knob Restriction to automatic transmission or power-assisted brakes | <ul style="list-style-type: none"> Scanning horizon more frequently Turning head 90° to maximize area scanned Large left and right side mirrors |

GUIDELINES

24.6 Private and commercial drivers with a neurological disorder

| | |
|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have:</p> <ul style="list-style-type: none"> • multiple sclerosis • Parkinson's disease • cerebral palsy, or • other neurological disorders. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a neurologist. <p>If the treating physician indicates possible impairment of one or more of the functions necessary for driving, the OSMV will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they retain sufficient range of motion, strength and coordination to perform the functions necessary for driving vehicles in their licence class • they have sufficient cognitive function to drive safely • any pain associated with the condition, or the drugs used to treat the condition, does not adversely affect their ability to drive safely • where required, a road test or other functional assessment indicates that they are able to compensate for any loss of functional ability required for driving, and • where permitted, they only drive with any vehicle modifications and devices required to compensate for their functional impairment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician does not indicate possible impairment of the functions necessary for driving, or • where the treating physician indicates that there may be impairment of the functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |

| | |
|--------------------------------|--|
| Conditions | No conditions are required. |
| Restrictions | <p>The OSMV will restrict an individual's licence so that they only drive with any permitted vehicle modifications and devices required to compensate for their functional impairment. This may include one or more of the following restrictions:</p> <p>26 Specified vehicle modifications required</p> <p>28 Restricted to automatic transmission</p> <p>51 [specify type of restriction]</p> |
| Reassessment guidelines | <p>If the neurological disorder is progressive (e.g., multiple sclerosis or Parkinson's disease), the OSMV will reassess every 5 years or in accordance with routine commercial or age-related reassessment, unless a shorter reassessment interval is recommended by the treating physician.</p> <p>If the neurological disorder is not progressive (e.g., cerebral palsy), no reassessment is required, other than routine commercial or age-related reassessment.</p> |
| Policy rationale | The potential functional impairments associated with neurological disorders are variable. |

Chapter 25: Traumatic Brain Injury

BACKGROUND

25.1 About traumatic brain injury

Traumatic brain injury (TBI) is a nondegenerative, noncongenital insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions, with an associated diminished or altered state of consciousness. The leading causes of TBI are falls and motor vehicle crashes.

Descriptions of the severity of a TBI reflect the length of time a person is unconscious or lacks awareness of their environment. Mild TBI indicates only a brief change in mental status or consciousness, while severe TBI describes an extended period of unconsciousness or amnesia after the injury.

TBI can result in a wide range of impairments, which will vary depending on the severity and location of the injury, and the age and general health of the injured person. Possible sensory impairments include:

- visual field deficits
- visual neglect
- diplopia, and
- loss of sensation or hearing.

Possible motor impairments include paralysis, paresis (partial loss of movement or impaired movement) and slowed reaction times. Cognitive impairments include impaired:

- attention
- memory
- executive functioning
- processing speed, and
- visuo-spatial abilities, including visual memory.

Behavioural impairments are common including disorders affecting mood and impulse control. Sleep disturbances, sleep apnea and fatigue are also commonly reported. TBI is also associated with epilepsy.

Anosognosia (unawareness of impairment) is common in individuals with TBI, particularly in those with moderate to severe TBI, and is of particular concern for driving. Research suggests that anosognosia is more frequently associated with cognitive and behavioural impairments than with physical deficits.

25.2 Prevalence and incidence of traumatic brain injury

Rates of incidence and prevalence of TBI are difficult to determine due to a lack of uniformity in definitions and reporting methods. Canadian data suggest that the overall prevalence of TBI is 62.3 per 100,000 adults. Rates were highest in the 45 to 64 year old age range, three times the rate of those in the 15 to 24 year old range.

25.3 Traumatic brain injury and adverse driving outcomes

Numerous studies have examined the relationship between TBI and driving outcomes. Although few studies have examined crash rates, the existing research indicates higher rates of crashes and traffic violations for those who have experienced a TBI. Notably, studies indicate that approximately 50% of those experiencing a TBI will not resume driving after the TBI. Research examining road test results indicates that approximately 30% of individuals who have experienced a TBI will fail a subsequent road test.

25.4 Effect of traumatic brain injury on functional ability to drive

Traumatic brain injury may result in a persistent cognitive, motor, or sensory impairment, or an episodic impairment (epilepsy), or both.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|------------------------|---|---|---|
| Traumatic brain injury | Persistent impairment: Functional assessment | Variable – cognitive, motor or sensory | Driver's Medical Examination Report Specialist's report ICBC road test SIMARD-MD DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |
| | Episodic impairment: Medical assessment – likelihood of impairment | Variable – sudden impairment (epilepsy) | Driver's Medical Examination Report Specialist's report |

25.5 Compensation

Individuals who have experienced a persistent impairment of motor or sensory function may be able to compensate. An occupational therapist, driver rehabilitation specialist, driver examiner or other medical professional may recommend specific compensatory vehicle modifications or restrictions based on an individual functional assessment.

Some examples of compensatory mechanisms are shown in the following table.

| Motor impairment | Sensory (vision) impairment |
|--|--|
| <ul style="list-style-type: none">• Steering wheel spinner knob• Restriction to automatic transmission or power-assisted brakes | <ul style="list-style-type: none">• Scanning horizon more frequently• Turning head 90° to maximize area scanned• Large left and right side mirrors |

GUIDELINES

25.6 Private and commercial drivers with a traumatic brain injury

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|--------------------------------------|--|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have suffered a traumatic brain injury (TBI).</p> <p>If the driver has epilepsy as a result of the TBI, also see the guidelines in Chapter 23.</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a specialist. <p>If the treating physician indicates possible impairment of one or more of the functions necessary for driving, the OSMV will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they retain sufficient movement and strength to perform the functions necessary for driving vehicles in their licence class • they have sufficient cognitive and visual function to drive safely • any pain associated with their condition or treatment for their condition does not adversely affect their ability to drive safely • where required, a road test or other functional assessment indicates that they are able to compensate for any loss of functional ability required for driving, and • where permitted, they only drive with any vehicle modifications and devices required to compensate for their functional impairment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician does not indicate possible impairment of the functions necessary for driving, or • where the treating physician indicates that there may be impairment of the functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | The OSMV will restrict an individual's licence so that they only drive |

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|--------------------------------|---|
| | <p>with any permitted vehicle modifications and devices required to compensate for their functional impairment. This may include one or more of the following restrictions:</p> <p>26 Specified vehicle modifications required</p> <p>28 Restricted to automatic transmission</p> <p>51 [specify type of restriction]</p> |
| Reassessment guidelines | No reassessment is required, other than routine commercial or age-related reassessment. |
| Policy rationale | The potential functional impairments associated with traumatic brain injury are variable. |

Chapter 26: Intracranial Tumours

BACKGROUND

26.1 About intracranial tumours

Intracranial tumours are tumours that develop inside the cranium, the upper portion of the skull that protects the brain. Primary tumours are those which originate from within the cranium and metastatic tumours are those which result from cancers which spread (metastasize) from other parts of the body. Metastatic tumours are by far the more common type of intracranial tumour in adults, 10 times more common than primary tumours.

Primary tumours may be classified as either benign (non-cancerous) or malignant (cancerous). Malignant tumours are graded on a scale of 1 to 4, with grade 4 being the most severe, based on how abnormal they are compared to normal tissue and how quickly they are likely to grow and metastasize.

Typically, the treatment options for intracranial tumours are surgery, radiation and chemotherapy, alone or in combination, regardless of whether the tumour is primary or metastatic, benign or malignant. For primary tumours, the probability of successful treatment depends on a number of factors, including the type of tumour, the size and the location.

Treatment will rarely cure a metastatic tumour, and the goal of treatment is generally to reduce symptoms, increase length of survival, and improve quality of life.

Impairments associated with intracranial tumours vary depending on the type, location and rate of growth of the tumour and can affect cognitive, motor, or sensory functions. Possible impairments include:

- cognitive impairment
- epilepsy
- personality changes
- focal weakness, and
- sensory disturbances.

The presentation of impairments may be progressive or variable.

26.2 Prevalence and incidence of intracranial tumours

The overall incidence of intracranial tumours in the United States is between 5 and 14 per 100,000 people (all ages), with the peak incidence in those between 65 and 79 years of age. Canadian data are lacking.

26.3 Intracranial tumours and adverse driving outcomes

No studies on the effects of intracranial tumours and driving were found.

26.4 Effect of intracranial tumours on functional ability to drive

An intracranial tumour may result in a persistent cognitive, motor, or sensory impairment, or an episodic impairment (epilepsy) or both.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|----------------------|---|---|---|
| Intracranial tumours | Persistent impairment: Functional assessment | Variable – cognitive, motor or sensory | Driver's Medical Examination Report Specialist's report ICBC road test SIMARD-MD DriveABLE assessment Functional assessment by an occupational therapist or driver rehabilitation specialist |
| | Episodic impairment: Medical assessment – likelihood of impairment | Variable – sudden impairment (epilepsy) | Driver's Medical Examination Report Specialist's report |

26.5 Compensation

Individuals who have experienced a persistent impairment of motor or sensory function may be able to compensate. An occupational therapist, driver rehabilitation specialist, driver examiner or other medical professional may recommend specific compensatory vehicle modifications or restrictions based on an individual functional assessment.

Some examples of compensatory mechanisms are shown in the following table.

| Motor impairment | Sensory (vision) impairment |
|--|--|
| <ul style="list-style-type: none">• Steering wheel spinner knob• Restriction to automatic transmission or power-assisted brakes | <ul style="list-style-type: none">• Scanning horizon more frequently• Turning head 90° to maximize area scanned• Large left and right side mirrors |

GUIDELINES

26.6 Private and commercial drivers with an intracranial tumour

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|--------------------------------------|---|
| Application | <p>These guidelines apply to driver fitness determinations for private and commercial drivers who have an intracranial tumour.</p> <p>If the driver has epilepsy as a result of the tumour, also see the guidelines in Chapter 23.</p> |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a specialist. <p>If the treating physician indicates possible impairment of one or more of the functions necessary for driving, the OSMV will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held, unless there has been no significant change in the individual's condition or functional ability since a previous functional assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they retain sufficient movement and strength to perform the functions necessary for driving vehicles in their licence class • they have sufficient cognitive and visual function to drive safely • the treatment of their condition or pain associated with their condition does not adversely affect their ability to drive safely • where required, a road test or other functional assessment indicates that they are able to compensate for any loss of functional ability required for driving, and • where permitted, they only drive with any vehicle modifications and devices required to compensate for their functional impairment. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician does not indicate possible impairment of the functions necessary for driving, or • where the treating physician indicates that there may be impairment of the functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | The OSMV will restrict an individual's licence so that they only drive with any permitted vehicle modifications and devices required to |

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|--------------------------------|---|
| | <p>compensate for their functional impairment. This may include one or more of the following restrictions:</p> <p>26 Specified vehicle modifications required</p> <p>28 Restricted to automatic transmission</p> <p>51 [specify type of restriction]</p> |
| Reassessment guidelines | <p>The OSMV will reassess every 5 years or in accordance with routine commercial or age-related reassessment, unless a shorter reassessment interval is recommended by the treating physician. No further reassessment is required if the tumour is successfully removed.</p> |
| Policy rationale | <p>The potential functional impairments associated with an intracranial tumour are variable.</p> |

Chapter 27: Cognitive Impairment including Dementia

BACKGROUND

27.1 About cognitive impairment and dementia

Cognitive impairment, also called cognitive dysfunction or neuropsychological impairment, refers to any impairment of a cognitive function such as:

- memory
- attention
- language
- problem solving, or
- judgment.

Cognitive impairment may have any number of causes including:

- brain trauma
- anoxia (lack of oxygen to the brain)
- infection
- toxicities, or
- degenerative, metabolic, or nutritional diseases.¹⁸

The presentation of cognitive impairment is variable depending on the cognitive functions affected and the degree of impairment. Cognitive impairment may progress to dementia, it may remain stable, or there may be a recovery of normal cognitive function.

Dementia

Dementia refers to a disorder characterized by memory impairment in conjunction with one or more other cognitive deficits. In North America, the most commonly used criteria for the diagnosis of a dementia are those articulated by the American Psychiatric Association. The defining features of dementia are:

A. The development of multiple cognitive deficits that include both

(1) memory impairment (impaired ability to learn new information or to recall previously learned information)

(2) one or more of the following cognitive disturbances:

¹⁸ Persistent cognitive impairment in association with other medical conditions is referenced in the following chapters: Cardiovascular Diseases and Disorders, Cerebrovascular Disease, Intracranial Tumours, Psychotropic Drugs, Neurological Disorders, Psychiatric Disorders, Chronic Renal Disease, Respiratory Diseases, Sleep Disorders, Traumatic Brain Injury, and Vestibular Disorders.

- i. aphasia (language disturbance)
 - ii. apraxia (impaired ability to carry out motor activities despite intact motor function)
 - iii. agnosia (failure to recognize or identify objects despite intact sensory function, and
 - iv. disturbance in executive functioning (e.g., planning, organizing, sequencing, abstracting).
- B. The cognitive deficits in criteria A (1) and (2) each cause significant impairment in social or occupational functioning and represent a significant decline from a previous level of functioning.
- C. The deficits do not occur exclusively during the course of a delirium.
- D. The deficits are not better accounted for by another Axis I disorder¹⁹ (e.g. Major Depressive Episode, Schizophrenia).

Dementia has many causes and more than 100 types of dementia have been documented. The five most common types of dementia are:

- Alzheimer's disease
- vascular dementia (multi-infarct dementia)
- mixed Alzheimer's and vascular dementia
- dementia with Lewy bodies (Lewy body dementia), and
- frontotemporal dementia (Pick's disease or Pick's complex). Frontotemporal dementia may not meet all of the criteria noted for dementia, especially in the early stages, but may still result in significant functional impairment.

These types of dementia are all progressive and irreversible, and are characterized by impairments in multiple cognitive functions.

In Alzheimer's disease, the most common form of dementia, the earliest cognitive symptoms include difficulties in:

- recent memory
- word finding
- confrontation naming
- orientation, and
- concentration.

In later stages:

- slowed rates of information processing
 - attentional deficits
 - disturbances in executive functions, and
 - impairments in language, perception and praxis
- are characteristic.

¹⁹ This refers to the classification of psychiatric disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR). See Chapter 19, Psychiatric Disorders, for more information on this classification system.

Less commonly, dementias can result from:

- head injury and trauma
- brain tumours
- depression
- hydrocephalus (excessive accumulation of cerebrospinal fluid (CSF) in the brain)
- bacterial and viral infections
- toxic, endocrine, and metabolic causes, or
- anoxia.

Some of these dementias may be reversible. Specific examples of reversible causes of dementia include:

- thyroid deficiency or excess
- vitamin B12 deficiency
- chronic alcoholism
- abnormal calcium levels
- dementia associated with celiac disease, and
- intracranial space-occupying lesions.

Treatment for dementia has become available over the last decade with cognition enhancing drugs such as donepezil (Aricept™), galantamine (Reminyl™) and rivastigmine (Exelon™). These drugs seem to improve symptoms of the disease in some stages of dementia but their therapeutic effect is variable. It is generally considered not likely that treatment with medication would improve cognition to a degree that would enable driving in those whose driving skills had declined to an unsafe level or those who had previously failed a driving assessment due to cognitive impairment.

Mild cognitive impairment

Mild cognitive impairment (MCI) is a term that usually refers to the transitional state between the cognitive changes associated with normal aging and the fully developed clinical features of dementia. The diagnostic criteria for MCI are evolving but in general it describes a cognitive decline that presents no significant functional impairment.

Delirium

Delirium is a condition characterized by a disturbance of consciousness and a change in cognition that occurs over a relatively short period of time, usually hours to days. Common causes of delirium include:

- vascular disorders (e.g. stroke, myocardial infarct)
- infections (e.g. urinary tract, chest)
- drugs (e.g. analgesics, sedatives, alcohol, illicit drugs), and
- metabolic disorders (e.g. renal failure, hepatic failure, endocrine disorders).

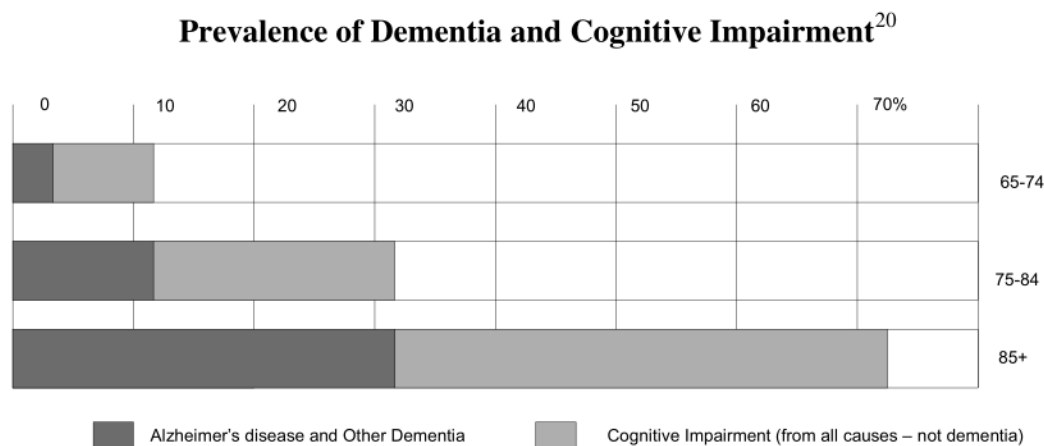
Although the symptoms of delirium may be similar to dementia, delirium is temporary and therefore considered a transient impairment for licensing purposes.

27.2 Prevalence and incidence of cognitive impairment and dementia

Estimates from the Canadian Study on Health and Aging (1991) suggest that 8% of all Canadians aged 65 and older meet the criteria for dementia, increasing to 34.5% for those 85 and older. A 2004 study projected that in 2007, there would be 65,780 individuals with dementia in British Columbia, 44,130 of whom would have Alzheimer's disease.

In relation to cognitive impairment from any cause that has not been diagnosed as dementia, research indicates that the prevalence is 8% in individuals aged 65 to 74, increasing to 42% for those 85 and older.

The prevalence of both cognitive impairment (all causes – not dementia) and dementia increases with age. As shown in the table below, when combined, the prevalence of cognitive impairment and dementia is 12% in those 65 to 74 and more than 72% in those 85 and older.



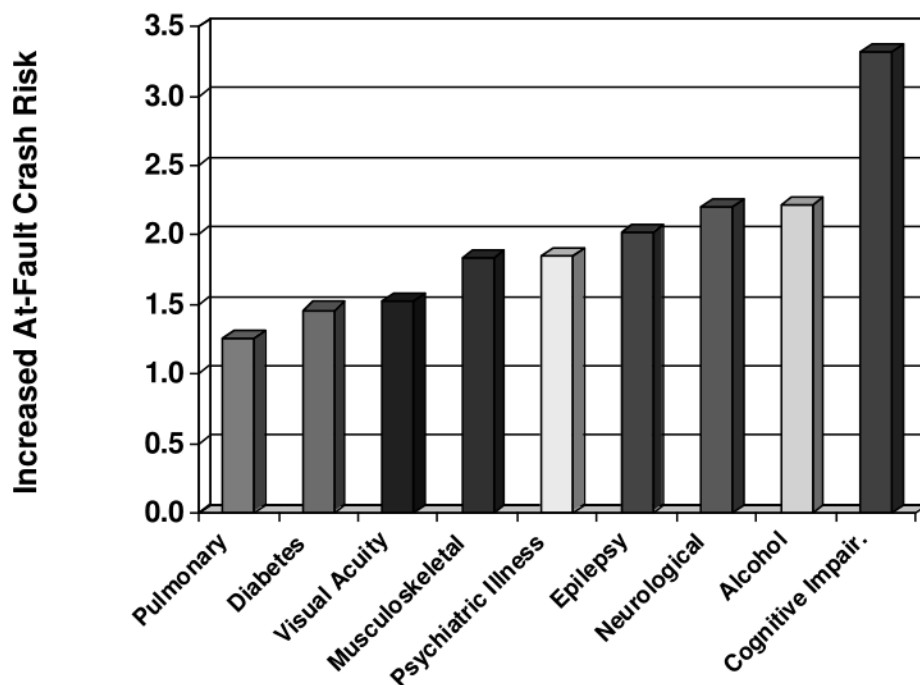
27.3 Cognitive impairment, dementia and adverse driving outcomes

Research clearly indicates that, as a group, those with dementia are at higher risk for adverse driving outcomes. In particular, individuals with dementia who experience behavioural disturbances and who are treated with psychotropic medications (e.g. anti-psychotics, anti-depressants) may be at increased risk. It is important to note that studies also indicate that many individuals with dementia show no evidence of deterioration of driving skills in the early stages of their illness.

²⁰ Source: Canadian Study of Health and Aging, 1991

The significance of cognitive impairment and dementia in relation to other medical conditions was highlighted in a 1999 study done in Utah. This study compared citations, crashes and at-fault crashes in individuals with medical conditions to those in healthy controls matched for age, gender and county of residence. As shown in the graph below, the results indicated that individuals with cognitive impairment (including dementia) had at-fault crash rates that were more than 3 times higher than controls. In comparison, the at-fault crash rate for those who had a history of alcohol or other drug abuse was 2 times higher than controls.

Risk of at-fault crash: selected medical conditions²¹



²¹ Source: Diller, E, Cook, L, Leonard, D, Reading, J, Dean, JM, Vernon, D. Evaluating drivers licensed with medical conditions in Utah, 1992-1996. DOT HS 809 023. Washington, DC: National Highway Traffic Safety Administration.

27.4 Effect of cognitive impairment and dementia on functional ability to drive

Cognitive impairment and dementia may affect one or more of the cognitive functions required for driving.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|--------------------------------------|--|-------------------------------------|--|
| Cognitive impairment Dementia | Persistent Impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |

27.5 Compensation

Individuals with cognitive impairment or dementia are not able to compensate for their functional impairment.

GUIDELINES

27.6 Private and commercial drivers with cognitive impairment or dementia

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|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have cognitive impairment or dementia. |
| Assessment guidelines | <p>If the treating physician or cognitive screening indicates:</p> <ul style="list-style-type: none"> • cognitive impairment, or • dementia <p>that may impair the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment, unless there has been no significant change in the individual's condition or cognitive ability since a previous functional assessment.</p> <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • the results of a SIMARD-MD test indicate that they have sufficient cognitive function to drive, or • where required, a DriveABLE assessment indicates that they are fit to drive. |
| OSMV determination guidelines | The OSMV may find individuals fit to drive if a functional assessment indicates that they have the functional ability required for their class of licence held. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>The OSMV will reassess annually if an individual has:</p> <ul style="list-style-type: none"> • dementia, or • a cognitive impairment that is progressive. |
| Policy rationale | <p>The result of a SIMARD-MD screen will indicate whether further assessment is required.</p> <p>If an individual scores X or higher, research indicates that it is very likely they have sufficient cognitive function for driving and OSMV requires no further assessment.</p> <p>If an individual scores Y or lower, research indicates that it is very likely they do not have sufficient cognitive function for driving and OSMV requires no further assessment to determine they are not fit to drive.</p> |

| | |
|--|---|
| | If an individual scores between X and Y, a functional assessment is required to determine if they have sufficient cognitive function for driving. |
|--|---|

Chapter 28: Sleep Disorders

BACKGROUND

28.1 About sleep disorders

Sleep disorders involve any difficulties related to sleeping, including:

- difficulty falling asleep (insomnia) or staying asleep
- falling asleep at inappropriate times
- excessive total sleep time, or
- abnormal behaviours associated with sleep.

This chapter focuses on the most common form of sleep disordered breathing - obstructive sleep apnea - and on narcolepsy.

In addition to sleep disorders, a number of other factors such as work schedules or lifestyle choices may result in inadequate nocturnal sleep. Regardless of the cause, the risks of excessive sleepiness for driving safety are similar.

Sleep disordered breathing

Sleep disordered breathing consists of three distinct clinical syndromes:

- obstructive sleep apnea-hypopnea syndrome (OSAHS): apnea-hypopnea caused by repeated closure of the throat or upper airway during sleep. This is the most common form of sleep disordered breathing.
- central sleep apnea-hypopnea syndrome (CSAHS): includes types of apnea-hypopnea caused by a neurological problem that interferes with the brain's ability to control breathing during sleep, as well as high altitude periodic breathing, and apnea-hypopnea due to drug or substance abuse.
- sleep hypoventilation syndrome (SHVS): a type of sleep disordered breathing characterized by insufficient oxygen absorption during sleep. It usually occurs in association with restrictive lung disease in morbidly obese individuals, with respiratory muscle weakness, or with obstructive lung disease such as COPD.

Obstructive sleep apnea-hypopnea syndrome

With OSAHS, the tissue and muscles of the upper airway repetitively collapse during sleep, reducing or preventing breathing. As oxygen levels in the blood fall, arousal causes the airway to re-open. Although individuals with OSAHS often remain asleep, their sleep patterns are disrupted. These sleep disturbances result in excessive daytime sleepiness. Impairments in cognitive function are common in individuals with OSAHS and these may include difficulties in:

- attention
- concentration

- complex problem solving, and
- short-term recall of verbal and spatial information.

Sleep monitoring is used to confirm a diagnosis of OSAHS. The preferred test used in diagnosis is nocturnal polysomnography. This test involves monitoring a number of physiological functions such as brain activity, respiration, heart activity, and oxygenation of the blood while an individual is sleeping. A diagnosis of sleep apnea is based on the apnea-hypopnea index (AHI), where apnea is defined as a cessation of airflow lasting at least 10 seconds and hypopnea is defined as a reduction in airflow with a decline in blood oxygen level lasting at least 10 seconds. Generally, an individual is diagnosed with sleep apnea if they have greater than 5 apnea/hypopnea episodes per hour of sleep.

There are a number of scales used to measure the severity of OSAHS. A scale based on the AHI describes the following levels of severity:

- Mild: 5 to 14 events per hour
- Moderate: 15 to 30 events per hour
- Severe: more than 30 events per hour.

Although nocturnal polysomnography is considered to be the best test for the diagnosis of OSAHS, a number of other tests may be used by sleep specialists to assist in evaluation or diagnosis. Overnight oximetry is similar to polysomnography, but only measures oxygen level and heart rate. Results from overnight oximetry alone are not considered adequate to diagnose OSAHS.

A number of tests are used to evaluate daytime sleepiness. These include the Maintenance of Wakefulness Test (MWT), the Multiple Sleep Latency Test (MSLT), and the Epworth Sleepiness Scale (ESS). MWT measures the level of daytime drowsiness based on how long a person can remain awake during the day under controlled conditions. The MSLT is similar to the MWT, but measures how long it takes a person to fall asleep when taking daytime naps, rather than how long they can stay awake. The ESS is a subjective test in which a person is asked to rate on a scale of 1 to 4 the likelihood that they would fall asleep in different situations, such as when watching TV, riding in a car, and engaging in conversation.

Treatment options for OSAHS include:

- lifestyle changes such as weight loss, alcohol abstinence, or change in sleep position
- the use of oral appliances
- the use of a nasal continuous positive airway pressure (CPAP) device,
- bariatric surgery (for morbidly obese individuals), and
- in rare cases, corrective upper airway surgery.

CPAP is the most effective treatment, and the only one which has been shown to reduce the risk of motor vehicle crashes. A CPAP machine blows heated, humidified air through a short tube to a mask worn by the individual while sleeping. As the individual breathes, air pressure from the CPAP machine holds the nose, palate, and throat tissues open.

An immediate reduction in daytime sleepiness is often reported with CPAP treatment, although studies indicate that approximately 6 weeks of treatment are required for maximum improvement in symptoms. Estimates of compliance with CPAP treatment vary depending on how they are measured. Subjective rates of compliance based on self-report are higher than objectively determined rates. Using objective measures, a 1993 study found that 46% of individuals were acceptably compliant with their CPAP treatment. The study defined acceptable compliance as the use of the CPAP machine for at least four hours per night for more than 70% of the observed nights.

Narcolepsy

Narcolepsy is a chronic neurological disorder in which the brain is unable to regulate sleep-wake cycles normally. It is characterized by excessive daytime sleepiness and may also cause cataplexy (abrupt loss of muscle tone), hallucinations and sleep paralysis. There is no known cure. The symptoms of narcolepsy relevant to driving are sleepiness and cataplexy.

The excessive daytime sleepiness of narcolepsy comprises both a background feeling of sleepiness present much of the time and a strong, sometimes irresistible, urge to sleep recurring at intervals through the day. This desire is heightened by conducive or monotonous circumstances, but naps at inappropriate times, such as during meals, are characteristic. The naps associated with narcolepsy usually last from minutes to an hour and occur a few times each day. Potential secondary symptoms related to sleepiness may include visual blurring, diplopia and cognitive impairment. Cognitive impairment may include difficulties with attention and memory.

Cataplexy refers to an abrupt loss of skeletal muscle tone. It is estimated that 60 to 90% of individuals with narcolepsy experience cataplexy. During a cataplexy attack, which can last up to several minutes and occur several times a day, an individual remains conscious but is unable to move. Generalized attacks can cause an individual to completely collapse, although the muscles of the diaphragm and the eyes remain unaffected. Partial attacks, which affect only certain muscle groups, are more common than generalized attacks. Laughter or humorous events are a common trigger of cataplexy attacks, although anger, embarrassment, surprise or sexual arousal can also trigger an attack.

As there is no cure, treatment for narcolepsy is focussed on the control of sleepiness and cataplexy where present. Medications used for treatment may include:

- stimulants such as Modafinil (Altertec™)
- tricyclic anti-depressants
- selective serotonin reuptake inhibitors
- venlafaxine (Effexor™), or
- reboxetine (Edronax™).

See Chapter 29, Psychotropic Drugs, for more information about medications and driving.

28.2 Prevalence and incidence of sleep disorders

OSAHS affects between at least 2% of women and 4% of men. It is more prevalent among middle aged and older individuals and those who are obese. It commonly remains undiagnosed, with estimates suggesting that 93% of women and 82% of men with moderate to severe sleep apnea are undiagnosed.

Canadian data on the prevalence of narcolepsy are lacking. Research in the United States indicates a prevalence rate of 47 per 100,000 individuals (.05%). It is more common in men than in women.

28.3 Sleep disorders and adverse driving outcomes

Numerous studies have investigated the relationship between OSAHS and adverse driving outcomes. The majority of studies indicate that individuals with OSAHS have a 2 to 4 times greater risk for a crash, and the crashes result in more severe injuries. Although numerous tests are available to measure daytime sleepiness, the research also indicates that measures of daytime sleepiness and the severity of sleep apnea are not consistent predictors of impairments in driving performance.

Unlike OSAHS, there are few studies on narcolepsy and adverse driving outcomes. Although limited, this research suggests that narcolepsy is also associated with elevated crash rates.

28.4 Effect of sleep disorders on functional ability to drive

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|-------------------------|---|--|--|
| OSAHS Narcolepsy | Episodic impairment: Medical assessment – likelihood of impairment | All – sudden incapacitation Cognitive – reduced alertness | Driver's Medical Examination Report Specialist's report |
| | Persistent impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |

28.5 Compensation

Individuals with sleep disorders are not able to compensate for their impairment.

Recently, a number of warning systems for drowsy drivers have been developed. These systems are designed to detect drowsiness by monitoring the driver's eye movement, head movement or other physical activity, or by sensing when a vehicle is drifting on the road. When drowsiness is suspected, a warning system alerts the driver. These systems are in various stages of development and production.

Research on the effectiveness of drowsy driving warning systems is limited. The existing research indicates that these technologies show promise as a means to warn drivers of fatigue or drowsiness. However, it is recognized that alertness is a complex phenomenon, and no single measure alone may be sensitive and reliable enough to quantify driver fatigue. Further research and development is required before the use of these warning systems can be applied in driver fitness decisions.

GUIDELINES

28.6 Private and commercial drivers with untreated OSA

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have untreated obstructive sleep apnea (OSA). |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a respirologist. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible persistent impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment, unless there has been no significant change in the individual's condition or cognitive ability since a previous functional assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have no history of sleep related motor vehicle crashes or sleep at the wheel in the last 5 years • the results of a SIMARD-MD test indicate that they have sufficient cognitive function to drive, or where required, a DriveABLE assessment indicates that they are fit to drive • they understand the nature of their condition and the potential impact on fitness to drive • they agree to report any episodes of sleep at the wheel to their treating physician and the OSMV, and • for commercial drivers, they have not declined further investigation or treatment of OSAHS where it has been recommended by their treating physician. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have no history of sleep related motor vehicle crashes or sleep at the wheel in the last 5 years • the results of a SIMARD-MD test indicate that they have sufficient cognitive function to drive, or where required, a DriveABLE assessment indicates that they are fit to drive • they understand the nature of their condition and the potential impact on fitness to drive |

| | |
|--------------------------------|--|
| | <ul style="list-style-type: none"> • they agree to report any episodes of sleep at the wheel to their treating physician and the OSMV, and • for commercial drivers, they have not declined further investigation or treatment of OSAHS where it has been recommended by their treating physician. |
| Conditions | <p>The OSMV will impose the following condition on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must cease driving and report to the OSMV and your physician if you have an episode of sleep at the wheel |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>The OSMV will reassess private drivers every two years or as recommended by the treating physician.</p> <p>The OSMV will reassess commercial drivers annually.</p> |
| Policy rationale | <p>The primary concerns with OSAHS are daytime sleepiness (risk of sleep while driving) and persistent cognitive impairment. Determining who is at risk of adverse driving outcomes due to daytime sleepiness is problematic. Because existing measures of daytime sleepiness and the severity of sleep apnea are not consistent predictors of impairments in driving performance, the fitness guidelines look to driver history of sleep at the wheel for identifying current risk of sleep while driving. They also emphasize the responsibility of the driver to be attentive to the risk for daytime sleepiness.</p> <p>Commercial drivers with untreated OSAHS may not continue to drive unless they follow their treating physician's recommendations for further investigation or treatment, even where daytime sleepiness has not been reported or cognitive impairment. This applies only to commercial drivers because of the uncertainty in the correlation between severity of sleep apnea and impaired driving performance.</p> |

28.7 Private and commercial drivers with treated OSA

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have obstructive sleep apnea (OSA) that has been treated or surgically treated. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician • a sleep study report, or • an assessment from a respirologist. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible persistent impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment, unless there has been no significant change in the individual's condition or cognitive ability since a previous functional assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • the effectiveness of their treatment has been established through repeat sleep monitoring • where applicable, they remain compliant with their treatment regime. For CPAP treatment, compliance means a minimum of 4 hours of use on at least 70% of nights, objectively documented. • the results of a SIMARD-MD test indicate that they have sufficient cognitive function to drive, or where required, a DriveABLE assessment indicates that they are fit to drive • they understand the nature of their condition and the potential impact on fitness to drive, and • they agree to report any episodes of sleep at the wheel to their treating physician and the OSMV. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • the effectiveness of their treatment has been established through repeat sleep monitoring • where applicable, they remain compliant with their treatment regime. For CPAP treatment, compliance means a minimum of 4 hours of use on at least 70% of nights, objectively documented. • the results of a SIMARD-MD test indicate that they have sufficient cognitive function to drive, or where required, a DriveABLE assessment indicates that they are fit to drive • they understand the nature of their condition and the potential |

| | |
|--------------------------------|---|
| | <p>impact on fitness to drive, and</p> <ul style="list-style-type: none"> • they agree to report any episodes of sleep at the wheel to their treating physician and the OSMV. |
| Conditions | <p>The OSMV will impose the following conditions on an individual who is found fit to drive:</p> <ul style="list-style-type: none"> • you must cease driving and report to the OSMV and your physician if you have an episode of sleep at the wheel, and • you must routinely follow your treatment regime and physician's advice regarding prevention of sleep at the wheel. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | <p>The OSMV will reassess private drivers every two years or as recommended by the treating physician.</p> <p>The OSMV will reassess commercial drivers annually.</p> |
| Policy rationale | The fitness guidelines for drivers with treated OSAHS focus on mitigating the risk by ensuring that treatment is effective and drivers are compliant with their treatment where applicable. |

28.8 Private drivers with narcolepsy

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private drivers who have narcolepsy. |
| Assessment guidelines | <p>If further information regarding an individual's medical condition is required, the OSMV will request:</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or • an assessment from a respirologist. <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> <p>If the treating physician, or cognitive screening, indicates possible persistent impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment, unless there has been no significant change in the individual's condition or cognitive ability since a previous functional assessment.</p> |
| Fitness guidelines | <p>Individuals may drive if:</p> <ul style="list-style-type: none"> • they have had no daytime sleep attacks, with or without treatment, during the past 12 months • they have had no episodes of cataplexy, with or without treatment, during the past 12 months, and • the results of a SIMARD-MD test indicate that they have sufficient cognitive function to drive, or where required, a DriveABLE assessment indicates that they are fit to drive. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> • they have had no daytime sleep attacks, with or without treatment, during the past 12 months • they have had no episodes of cataplexy, with or without treatment, during the past 12 months, and • the treating physician or cognitive screening does not indicate possible impairment of the cognitive functions necessary for driving or, where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required to drive a private vehicle. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess annually. If no episodes or attacks are reported, the OSMV may assess less frequently upon the recommendation of the treating physician. |

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| <p>Policy rationale</p> | <p>The general approach of the guidelines for drivers with narcolepsy is that attacks must be controlled as a prerequisite to driving. Where an individual is treated, the guidelines include a requirement for an attack-free period to establish the likelihood that:</p> <ul style="list-style-type: none"> • a therapeutic drug level has been achieved and maintained • the drug being used will prevent further attacks, and • there are no side effects that may affect the individual's ability to drive safely. <p>The episodic risk of a sleep attack or cataplexy while driving is addressed in the requirement for a 12 month period without an episode prior to driving. The length of this no driving period is based on consensus medical opinion in Canada.</p> |
|--------------------------------|--|

28.9 Commercial drivers with narcolepsy

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|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for commercial drivers who have narcolepsy. |
| Assessment guidelines | The OSMV will not generally request further information. |
| Fitness guidelines | Individuals may not drive. |
| OSMV determination guidelines | Individuals are not fit to drive. |
| Conditions | N/A |
| Restrictions | N/A |
| Reassessment guidelines | N/A |
| Policy rationale | Consensus medical opinion in Canada indicates that the risks from the increased driving exposure associated with commercial driving are such that individuals with narcolepsy are not fit to drive. |

Chapter 29: Psychotropic Drugs

BACKGROUND

29.1 About psychotropic drugs

It is increasingly clear that psychotropic (capable of affecting the mind, emotions, or behaviour) drugs contribute to impairment in driving performance. It has been estimated that approximately 10% of all people killed or injured in crashes were taking psychotropic medication, which might have been a contributory factor to the crash.

This chapter focuses on drugs that are commonly prescribed or used to treat medical conditions, and that are known to have psychotropic effects or potential side effects that could impair functional ability to drive. Illicit drugs are not considered in this chapter

Opioids (narcotics)

Opioids are derived from natural opium or a synthetically produced equivalent and are used primarily for pain relief. Opioid drugs include the following:

- codeine
- fentanyl [Duragesic®]
- morphine
- meperidine [Demerol®]
- methadone
- pentazocine [Talwin®]
- hydromorphone [Dilaudid®]
- propoxyphene [Darvon®], and
- oxycodone [Percodan®]

Antidepressants

Antidepressants are used in the treatment of major depression and a variety of other conditions such as chronic pain, anxiety, and Obsessive-Compulsive Disorder. Classes of antidepressants and examples of drugs from each class are listed in the table below.

| Class | Generic Name | Brand Name |
|---|---------------------|------------------------|
| Tricyclic antidepressants (TCAs) | amitriptyline | Elavil® |
| | imipramine | Tofranil® |
| | nortriptyline | Aventyl® |
| Selective serotonin-reuptake inhibitors (SSRIs) | fluoxetine | Prozac® |
| | fluvoxamine | Luvox® |
| | sertraline | Zoloft® |
| | citalopra | Celexa® |
| | paroxetine | Paxil® |
| Dual action agents (DAAs) | venlafaxine | Effexor® |
| | bupropion | Zyban®, Wellbutrin SR® |
| Monoamine oxidase inhibitors | phenelzine | Nardil® |
| | tranylcypromine | Parnate® |

Antiepileptics

The following are 8 major categories of drugs used in the treatment of epilepsy and other conditions such as mood disorders or pain, in approximate order of the date they were introduced:

- barbiturates and derivatives (phenobarbital)
- succinimide derivatives (methsuximid [Celontin®])
- hydantoin derivatives (phenytoin [Dilantin®])
- iminostilbene derivatives (carbamazepine [Tegretol®])
- benzodiazepines (clonazepam [Clonepam®])
- carboxylic acid derivatives (divalproex sodium [Depekene®], valproic acid [Valporate®])
- various anticonvulsants (lamotrigine [Lamocin®], topiramate [Topamax®]), and
- GABA derivatives (gabapentin [Neurontin®]).

Antihistamines

Antihistamines inhibit the activity of histamine, a protein involved in many allergic reactions. They are commonly prescribed to alleviate the symptoms of allergic reactions.

Examples of older antihistamines include:

- tripolidine [Actifed®]
- clemastine [Tavist®]
- dephenhydramine [Benadryl®], and
- terfenadine [Seldane®].

Examples of newer antihistamines include:

- loratadine [Claritin®]
- cetirizine hydrochloride [Zyrtec®]
- ceterizine [Reactine®]
- deslor-atadine [Clarinex®], and
- fexofenadine [Allegra®].

Antipsychotics

Antipsychotics are used primarily in the management of serious mental disorders such as schizophrenia, bipolar disorder, and organic psychoses (psychiatric symptoms arising from damage to or disease in the brain). The two major groups of antipsychotics are the “typical” or conventional antipsychotics, introduced in the early 1950’s, and the “atypical” antipsychotics, introduced in the early 1990’s and later.

Examples of typical antipsychotics include:

- haloperidol [Haldol®], and
- chlorpromazine [Thorazine®].

Examples of atypical antipsychotics include:

- clozapine [Clozaril®]
- risperidone [Risperdal®]
- olanzapine [Zyprexa®]
- risperdal [Consta®]
- quetiapine [Seroquel®], and
- ziprasidone [Geodon®].

Non-steroidal anti-inflammatories

Non-steroidal anti-inflammatory drugs (NSAIDs) are used for pain relief, the reduction of fever, and to reduce inflammation. Examples of NSAIDs include:

- aspirin
- diclofenac [Voltaren®]
- ibuprofen [Motrin®]
- celecoxib [Celebrex®], and
- indomethacin [Indocid®].

NSAIDs often are used in the treatment of pain and inflammation in both acute and chronic conditions, such as:

- rheumatoid arthritis and osteoarthritis
- gout
- metastatic bone pain
- headaches and migraines, and
- mild to moderate pain due to inflammation and tissue injury (e.g., pain associated with tooth extraction, root canal, sports injuries, etc.).

Sedatives and hypnotics

Sedative and hypnotic drugs are central nervous system depressants. They are used to treat anxiety, as muscle relaxants, and anticonvulsants. The major categories are barbiturates, benzodiazepines and a new class of non-benzodiazepine sedatives called Z drugs.

Benzodiazepines can be divided into those with a short half-life (2 to 4 hours), which generally are used to treat insomnia, and those with a long half-life (6 to 8 hours), which are used to treat anxiety.

Categories of sedatives and hypnotics and examples of drugs in each category are provided in the table below.

| Category | Generic Name | Brand Name |
|--|-----------------|------------|
| Barbiturates | secobarbital | Seconal® |
| Benzodiazepines with a short half-life | lorazepam | Ativan® |
| | alprazo | Amixanax® |
| | triazolam | Halcion® |
| | oxazepam | Serax® |
| | temazepam | Restoril® |
| Benzodiazepines with a long half-life | clonazepam | Klonopin® |
| | clordiazepoxide | Librium® |
| | diazepam | Valium® |
| | halazepam | Pxipam® |
| | prazepam | Centrax® |
| | clorazepate | Tranxene® |
| | flurazepam | Daimane® |
| Z drugs | zopiclone | Imovane® |
| | zolpidem | Ambien® |

Stimulants (for ADHD)

Examples of stimulants used in the treatment of Attention Deficit Hyperactivity Disorder (ADHD) include:

- methylphenidate [Ritalin®, Methylin®, Metadate®, Concerta®, Daytrana®]
- dextromethylphenidate [Focalin®, Dexedrine®], and
- mixed amphetamine salts [Adderall®].

29.2 Prevalence and incidence of psychotropic drugs

Opioids

No data are available on the use of opioids as a treatment for medical conditions in Canada.

Antidepressants

The most commonly used classes of antidepressants are SSRIs, dual action agents, and tricyclics. Research from 2002 showed that SSRIs had a 46.3% market share, dual action agents had 23.9% and tricyclics had 23.7%. The least commonly used class was monoamine oxidase inhibitors, with a 2.1% market share.

Between 1981 and 2000, total prescriptions for antidepressants increased almost five fold, from 3.2 to 14.5 million. The 2002 Canadian Community Health Survey indicated that 5.8% of Canadians were taking antidepressants. Of those who had a major depressive episode in the past year, 40.4% were taking antidepressants.

Antiepileptics

No data on the prevalence of antiepileptic drug use in Canada is available. Epilepsy itself has a prevalence rate of 0.6% in the Canadian population. The incidence of epilepsy is 15,500 new cases per year, with 60% of these being young children or seniors. Because of the variability of the presentation of epilepsy among those diagnosed, and the use of antiepileptic drugs for conditions other than epilepsy, it is difficult to extrapolate the prevalence of anticonvulsant drug use based on the prevalence and incidence of epilepsy.

Antihistamines

The general use of antihistamines is difficult to ascertain. However, it has been estimated that allergic conditions that may be treated with antihistamines affect 10% to 25% of the population.

Antipsychotics

Prevalence statistics on the use of antipsychotics in Canada using population based surveys are complicated by low prevalence and questionable validity.

Non-steroidal anti-inflammatories

NSAIDs are among the most commonly used pharmacological agents, with 10 million prescriptions dispensed annually in Canada. The use of NSAIDs is predicted to increase with the aging population due to the association between age and musculoskeletal disorders such as osteoarthritis and rheumatoid arthritis.

Sedatives and hypnotics

Data from 2002 Canadian Community Health Survey indicated that the percentage of those who had used a sedative or hypnotic increased with age, moving from 3.1% of the general population 15 years and older, to 11.1% for those 75 and older. Overall, 7.2% of those with anxiety disorders had taken a sedative-hypnotic over the two days preceding the survey.

Benzodiazepine use made up most of the sedative-hypnotic use in all analyzed demographic and diagnostic groups. Information from this survey and other studies indicate that benzodiazepines are one of the most frequently used classes of drugs by seniors and women.

Stimulants (for ADHD)

No data is available on the prevalence or incidence of the use of stimulants as a treatment for ADHD in Canada. An indication of the use of stimulants for ADHD may be gleaned from the prevalence of the condition itself. Research indicates that ADHD affects between 3% and 10% of children and between 4% and 6% of adults. Of adolescents and adults with ADHD, 76% achieve a therapeutic response with stimulant medication.

29.3 Psychotropic drugs and adverse driving outcomes

Opioids

Research indicates that the use of opioids can adversely affect driving performance, with the degree of impairment dependent on the particular opioid used, dosage, previous use, and developed tolerance.

Antidepressants

Currently, there is little evidence to associate SSRIs or dual action agents with impaired driving performance. Although limited, research indicates that the use of tricyclic antidepressants is associated with impairments in driving performance. This is evidenced by elevated crash rates, as well as measures of on-road performance and laboratory tests of psychomotor and cognitive functioning.

Antiepileptics

In general, individuals with epilepsy have an increased risk for adverse driving outcomes, which may be caused by either the episodic impairment (seizures) or persistent impairments caused by the condition or treatment.

Antihistamines

Research indicates that the use of older antihistamines may impair driving performance. However, newer antihistamines used in therapeutic doses do not appear to increase the risk of adverse driving outcomes.

Antipsychotics

Studies examining the driving performance of individuals treated with antipsychotics (primarily those with Schizophrenia) indicate that those treated with atypical antipsychotics perform better than those treated with typical antipsychotics. However, less than 33% of those on atypical antipsychotics and 5% to 11% of those on typical antipsychotics were found to have adequate driving performance. It should be noted that these results are based on functional tests conducted in a laboratory setting, and the relationship of these results to actual driving performance has not been established. Further, it is difficult to determine the relative impact of the underlying condition and antipsychotic treatment on driving performance.

Non-steroidal anti-inflammatories

There is only a small body of literature related to the effects of NSAIDs on driving performance. These studies indicate that the use of NSAIDs is associated with an increased risk of crash in both young and old drivers.

Sedatives and hypnotics

Research indicates that the use of sedatives and hypnotics is associated with a significant risk for adverse driving outcomes.

Stimulants (for ADHD)

There is some indication that pharmacological treatment of ADHD with stimulants may have a positive effect on driving performance. However, research in this area has primarily relied on driving simulators to measure outcomes. A few studies have investigated the relationship between pharmacological treatment of ADHD and on-road performance, but methodological limitations, including small sample size (< 20 in all cases), limit the findings.

29.4 Effect of psychotropic drugs on functional ability to drive

The OSMV is primarily concerned with the persistent cognitive impairment associated with the effects or side effects of medication used for ongoing treatment of medical conditions. Potential temporary impairments from short term treatment or changes in dosage or type of medication are considered transient impairments for licensing purposes.

Opioids

The use of opioids results in depression of the central nervous system. Possible effects on the functions necessary for driving include:

- blurred vision
- poor night vision
- slowed reaction times
- tremors
- impairment of short term/working memory and attention, and

- disorientation or hallucinations.

The effects of opioids on an individual depend on a number of factors, including the length of use, dosage, and propensity for abuse or addiction. Tolerance is an important consideration in that adverse effects may be evident during acute use but diminish as tolerance develops.

Antidepressants

The effects of antidepressants on cognitive ability vary by therapeutic class. Depression itself may result in cognitive impairment. While the use of antidepressants may improve cognitive function, the side effects may include cognitive impairment, including:

- impairment of thought processing
- attentional deficits
- indecisiveness, and
- impairment of psychomotor function.

Therefore, distinguishing between the effects of the disorder and the side-effects of antidepressants may be a challenge.

Tricyclic antidepressants

The major side effects of TCAs that may affect driving are anticholinergic effects such as confusion or blurred vision and sedating effects. The following table outlines the severity of the sedating effect of common TCAs.

| Sedating Effect | TCAs |
|-----------------|---|
| Low | desipramine [Pertofrane®], protriptyline [Triptil®], nortriptyline [Aventyl®], amoxapine [Asendin®], trazadone [Desyrel®] |
| Moderate | imipramine [Tofranil®], maprotiline [Ludiomil®] |
| High | amitriptyline [Elavil®], doxepin [Sinequan®] |

Selective serotonin-reuptake inhibitors

SSRIs generally have fewer side effects than TCAs. Nonetheless, some studies have shown impairments in both cognitive and psychomotor functioning in individuals using SSRIs.

Dual action antidepressants

Research indicates that DAAs, the most recently introduced class of antidepressants, have fewer side effects than TCAs or SSRIs, but cognitive impairment associated with depression and/or treatment may still be present.

Antiepileptics

Anticonvulsants may impair motor and sensory functions, producing:

- ataxia (lack of coordination; unsteadiness)
- nystagmus (uncontrollable rapid eye movement)
- blurring and double vision, and/or
- tremor.

Disruption of normal cognitive function is a frequent and pervasive side effect of anticonvulsant drugs. A variety of cognitive abilities may be affected, including memory, reaction time, executive functioning, and problem solving.

The known side effects of first generation anticonvulsant drugs (phenobarbital, phenytoin, benzodiazepines, and valproate) include sedation and cognitive dysfunction. Adverse cognitive effects, including impairments in memory and attention, are also evident with the use of more recently introduced anticonvulsant drugs (e.g., topiramate), though these generally have fewer side effects.

Antihistamines

Histamine is involved in many brain functions, including the waking-sleep cycle, attention, memory, learning and excitation. The effects of antihistamines differ depending on their generation. Older antihistamines, such as triprolidine [Actifed®], dephenhydramine [Benadryl®], and clemastine or terfenadine [Seldane®] are associated with profound sedation, impaired psychomotor function, and blurred vision.

Newer antihistamines, such as:

- loratadine [Claritin®]
- ceterizine [Reactine®]
- exofenadine [Allegra®]
- cetirizine hydrochloride [Zyrtec®], and
- deslor-atadine [Clarinex®]

are largely free from the sedating effects of the older antihistamines. However, at high doses, significant side-effects have been reported, though still less pronounced than those associated with older antihistamines.

Beta-blockers

Common side effects of beta-blockers include tiredness, sleep disturbances, and dizziness. Less common side effects relevant to driving include impairments in attention, mental flexibility (executive functioning), and memory.

The available evidence indicates that impairments in cognitive functioning can be a side effect of beta blockers. However, results from the majority of studies indicate that there is little in the way of evidence to indicate that beta blockers negatively impact cognitive performance in the general population of beta blocker users.

Antipsychotics

Research suggests that atypical antipsychotic drugs may improve cognitive functioning in individuals with Schizophrenia compared to treatment with typical antipsychotics. Nonetheless, the research indicates that even with atypical antipsychotics, individuals still experience residual cognitive impairments.

Non-steroidal anti-inflammatories

In general, the analgesic and anti-inflammatory effects of NSAIDs result in improvements in functional abilities (e.g., reduction in pain and stiffness in those with osteoarthritis, resulting in increased physical function and improvements in quality of life). However, there is a suggestion that the use of NSAIDs can impair cognitive ability.

Sedatives and hypnotics

The adverse effects of sedatives and hypnotics may include:

- sedation
- drowsiness
- cognitive and psychomotor impairment
- impaired coordination
- vertigo
- dizziness, and
- blurred or double vision.

Impairments are greater with higher dosage and with drugs that have a longer half-life.

Those using sedatives and hypnotics are subject to developing dependency, addiction and increasing tolerance of the effects. Because of this, Health Canada advises that these drugs should only be used for short periods (e.g. less than 2 months for anxiety; 7 to 10 days for insomnia). Nonetheless, research indicates that long term use is not uncommon. Long term adverse effects of benzodiazepine may include cognitive decline, unwanted sedation and impaired coordination.

Stimulants (for ADHD)

There is some indication that stimulants may have a positive effect on driving performance. However, the effect of stimulant medication on the functional ability of individuals with ADHD is unclear because of the methodological limitations of research to date.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|---------------------------|---|--|--|
| Use of psychotropic drugs | Persistent Impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |

29.5 Compensation

An individual can't compensate for the effects of psychotropic drug use.

GUIDELINES

29.6 Private and commercial drivers who use psychotropic drugs

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who are using psychotropic drugs. |
| Assessment guidelines | <p>If the treating physician, or cognitive screening, indicates possible persistent impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment, unless there has been no significant change in the individual's condition or cognitive ability since a previous functional assessment.</p> <p>Otherwise, the OSMV will not generally request further information.</p> |
| Fitness guidelines | <p>The OSMV will consider the following points when making a driver fitness determination in relation to the use of drugs:</p> <ul style="list-style-type: none"> the OSMV is primarily concerned with the persistent cognitive impairment associated with the effects or side effects of medication used for ongoing treatment of medical conditions. Temporary impairments from short term treatment or changes in dosage or type of medication are considered transient impairments for licensing purposes. In these circumstances, the prescribing physician should advise patients not to drive until the effect of a drug is known. Where there is evidence of some persistent cognitive impairment caused by a stable dose, individuals should be assessed for fitness to drive. Where an individual is taking multiple drugs (polypharmacy), OSMV will consider the potential compounding effects. Where relevant, OSMV will also consider the potential compounding effect of the use of alcohol or illicit drugs. |
| OSMV determination guidelines | <p>The OSMV may find individuals fit to drive if:</p> <ul style="list-style-type: none"> the treating physician or cognitive screening does not indicate possible persistent impairment of the cognitive functions necessary for driving, or where the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, a functional assessment indicates that they have the functional ability required for their class of licence held |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |

| | |
|---------------------------------------|---|
| <p>Reassessment guidelines</p> | <p>No reassessment, other than routine commercial or age-related reassessment is required, unless:</p> <ul style="list-style-type: none"> • the reassessment guidelines for the underlying condition require reassessment • the treating physician indicates non-compliance or mis-use of psychotropic drugs, and/or • the treating physician or cognitive screening indicates possible persistent cognitive impairment. |
| <p>Policy rationale</p> | <p>The use of a psychotropic does not mean that an individual is unfit to drive. Where there is some evidence of a persistent cognitive impairment associated with the stable use of a drug, an individual assessment of the effect of the drug is required to determine driver fitness.</p> |

Chapter 30: General Debility and Lack of Stamina

BACKGROUND

30.1 About general debility and lack of stamina

General debility

General debility is a state of general weakness or feebleness that may be a result or an outcome of one or more medical conditions that produce symptoms such as pain, fatigue, cachexia and physical disability, or cognitive symptoms of attention, concentration, memory, developmental and/or learning deficits.

Some of the medical conditions included in this part of the Manual may be commonly associated with general debility, e.g. end stage renal disease, and in these cases this is noted in the medical condition chapter. However, general debility is more usually associated with multiple medical conditions or extreme old age. Medications used to treat various medical conditions may also produce effects that contribute to general debility.

Common medical conditions not included in this Manual that may result in general debility are:

- anorexia nervosa or other related eating disorders
- chronic fatigue syndrome
- malabsorption syndromes (e.g. cystic fibrosis, Crohn's disease) and malnutrition
- AIDS
- chronic infections, e.g. TB or HIV
- malignancies, and
- conditions resulting in chronic pain.

Lack of stamina

Stamina is the physical or mental strength to resist fatigue and tiredness and maintain functional ability over time. Lack of stamina is not the same as general debility. While drivers with general debility do not have sufficient stamina to drive, drivers suffering from a lack of stamina may not be suffering from general debility.

Generally, concerns about stamina only arise in extreme old age or when a driver has a condition that results in a persistent impairment. For drivers with co-morbidities, stamina may be a particular concern.

Some of the medical conditions in this part of the Manual may be commonly associated with a lack of stamina, e.g. congestive heart failure, and in these cases this is noted in the medical condition chapter.

30.2 Effect of general debility and lack of stamina on functional ability to drive

Both a lack of stamina and general debility may impair an individual's motor and/or cognitive functions necessary for driving.

A person suffering from a lack of stamina may experience:

- fatigue
- physical disability, and/or
- cognitive impairment such as loss of attention, concentration and memory.

A person suffering from general debility may experience:

- pain
- fatigue / poor stamina
- cachexia - a condition marked by loss of appetite, weight loss, muscular wasting, and general mental and physical debilitation
- physical disability, and/or
- cognitive impairment such as loss of attention, concentration and memory.

| Condition | Type of driving impairment and assessment approach | Primary functional ability affected | Assessment tools |
|---|--|-------------------------------------|--|
| General debility Lack of stamina | Persistent Impairment: Functional assessment | Cognitive | Driver's Medical Examination Report SIMARD-MD DriveABLE assessment |
| | | Motor | Driver's Medical Examination Report ICBC road test |

30.3 Compensation

An individual can not compensate for general debility or a lack of stamina that impairs the functions necessary for driving.

GUIDELINES

30.4 Private and commercial drivers with frailty, weakness or general debility

| | |
|--------------------------------------|---|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have frailty, weakness or general debility. |
| Assessment guidelines | <p>If the treating physician indicates that an individual has general debility, the OSMV will not generally request additional information or assessments.</p> <p>If the treating physician indicates:</p> <ul style="list-style-type: none"> • frailty • reduced reaction time, or • weakness <p>the OSMV will request an ICBC road test.</p> <p>If the treating physician or cognitive screening indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment.</p> <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> |
| OSMV determination guidelines | <p>Individuals are not fit to drive if:</p> <ul style="list-style-type: none"> • the treating physician indicates that the individual has general debility, or • the results of a functional assessment indicate that the individual does not have the functional ability to drive the types of vehicles allowed by their class of licence. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every two years, unless the treating physician recommends annual reassessment. |
| Policy rationale | Frailty, weakness or general debility may include one or more cognitive, motor or visual impairment. Decisions about driver fitness should be based on an individual functional assessment. |

30.5 Private and commercial drivers with a lack of stamina

| | |
|--------------------------------------|--|
| Application | These guidelines apply to driver fitness determinations for private and commercial drivers who have a lack of stamina. |
| Assessment guidelines | <p>If the treating physician indicates concerns regarding stamina, the OSMV will request an ICBC road test.</p> <p>If the treating physician indicates possible impairment of the cognitive functions necessary for driving, the OSMV will request a DriveABLE assessment. Because the effects of a lack of stamina on cognitive function may not be evident during the course of the short SIMARD-MD cognitive screen, the OSMV will generally request a DriveABLE assessment of individuals whose cognitive functions necessary for driving may be impaired by a lack of stamina, even if the results of the cognitive screen show that the individual's cognitive function is not impaired.</p> <p>If cognitive screening indicates that the cognitive functions necessary for driving are impaired, the OSMV will not request further assessments.</p> |
| OSMV determination guidelines | Individuals are not fit to drive if a functional assessment indicates declining performance over the course of the assessment, or otherwise indicates that the lack of stamina impairs the individual's functional ability to drive the types of vehicles allowed by their class of licence. |
| Conditions | No conditions are required. |
| Restrictions | No restrictions are required. |
| Reassessment guidelines | The OSMV will reassess every two years, unless the treating physician recommends annual reassessment. |
| Policy rationale | In order to be fit to drive, an individual must be able to maintain a sufficient level of functional impairment over time. Decisions about driver fitness should be based on an individual functional assessment. |

PART 4:

APPENDICES

Appendix 1: Glossary of Terms

| | |
|--------------------------|---|
| Commercial driver | means a driver with: <ul style="list-style-type: none">• a class 1, 2, 3 or 4 licence, or• a class 5 licence with endorsement 18, 19 or 20. |
| Co-morbidities | means medical conditions that exist at the same time as the primary condition in the same patient, for example, hypertension is a co-morbidity of many conditions such as diabetes, ischemic heart disease and end-stage renal disease. The medical condition chapters in part 3 of this Manual indicate any co-morbidities commonly associated with each medical condition. |
| Compensation | is the use of strategies or devices by a driver with a persistent impairment to compensate for the functional impairment caused by a medical condition. Treatment for a condition, e.g. medication, is not a type of compensation. Where available or known, possible compensation strategies for each medical condition are included in the medical condition chapters in part 3 of this Manual. |
| Condition | means a condition that is imposed on an individual by the OSMV. Unlike restrictions, which are placed on a licence and enforceable at roadside, conditions are placed on a driver and are not enforceable at roadside. Examples of conditions are ‘do not drive if your blood sugar drops below 4mmol/L,’ or ‘do not drive if your dialysis treatment is delayed.’ |
| Credible report | means an unsolicited report from: <ul style="list-style-type: none">• a health care professional• the police• ICBC front-line staff• a government agent• a family member, or• a concerned member of the public that provides objective information about a driver’s functional ability to drive. |

Driving record

includes:

- the length of time an individual has been licensed
- driving offences
- driving sanctions applied
- current and past licence restriction(s)
- motor vehicle related Criminal Code convictions
- crash history, and
- past road test results.

Episodic impairment

is the result of a medical condition that does not have any ongoing measurable, testable or observable impact on the functional ability to drive but that may result in an unpredictable sudden or episodic impairment of the functions needed for driving.

For example, the medical condition that gives rise to the impairment may be testable, e.g. the size of an abdominal aortic aneurysm, or known, e.g. epilepsy, but the precipitating event that negatively impacts the functional ability to drive, e.g. the rupture of the aneurysm or an epileptic seizure, is not predictable. The source of the potential impairment is known and the inevitability of functional impairment is known in the event that the episodic impairment occurs, but when it will occur is not known.

Fit to drive

means that an individual's motor, sensory and cognitive functions are sufficient to drive safely

Functional assessment

is any kind of assessment that involves direct observation or measurement of the functions necessary for driving. Functional assessments include:

- paper-pencil tests
- computer-based tests
- eye tests
- hearing tests
- driver rehabilitation specialist assessments, and
- road tests.

Medical assessment is any kind of assessment that provides information regarding an individual's medical condition and/or their response to, or compliance with, treatment. This includes assessments such as ultrasounds, blood tests and other medical tests that are not requested by the OSMV, but are often submitted by physicians and provide useful information regarding an individual's medical condition.

Medical condition is any injury, illness, disease or disorder that is identified in Part 3 of this Manual or that may impair the functions necessary for driving. For purposes of the Driver Fitness Program, impairment resulting from medications and/or treatment regimes that have been prescribed as treatment for a medical condition is also considered a medical condition. General debility and a lack of stamina are also considered as medical conditions that may impair the functions necessary for driving.

Incidence means the annual number of new cases of a medical condition.

Insight means that a driver:

- is aware of their medical condition
- understands how the condition may impair their functional ability to drive, and
- has the judgment and willingness to comply with their treatment regime and any conditions or restrictions imposed by the OSMV.

Physicians will often use terms such as "impaired awareness," "decreased metacognition," or "lack of awareness regarding deficits" on a medical assessment to indicate that an individual lacks insight.

An individual's level of insight is a critical consideration when assessing the risk of an episodic impairment of functional ability due to a psychiatric disorder. Because of this, there is a specific guideline regarding insight in the Psychiatric Disorders chapter.

| | |
|------------------------------|--|
| Persistent impairment | is an ongoing or continuous impairment to a function necessary for driving. The potential impacts of persistent impairments on the functions necessary for driving are generally measurable, testable and observable. Although the condition may be progressive, the progression is usually slow and sudden deterioration is unlikely. Persistent impairments may be stable, e.g. loss of leg, or progressive, e.g. arthritis. |
| Prevalence | means the global occurrence of a medical condition. |
| Private driver | means a driver with a class 5, 6, 7 or 8 licence. |
| Reassessment | is the process of screening, assessment and determination for an individual with a previously reported medical condition. Reassessment is initiated when a request for a driver's medical examination or an EVF is sent to an individual at the expiration of an OSMV-scheduled reassessment interval. |
| Restriction | <p>means a restriction that is printed on a driver's licence and is enforceable at the roadside through fines. Non-compliance with a restriction is an offence.</p> <p>Restrictions are commonly used for impairments where a driver can compensate. However, on occasion they may be used for impairments for which a driver cannot compensate. Examples of restrictions where a driver can compensate for their persistent impairment are 'wear corrective lenses', 'must only drive modified vehicle with steering knob' and 'use oversized mirrors.' A restriction where a driver cannot compensate would be 'do not drive at night' for persistent night blindness.</p> |
| Sudden incapacitation | means the sudden loss of the functions necessary for driving. It may be the result of a total or partial loss of consciousness, narcolepsy, overwhelming pain, seizures or other episodic events. |

Transient impairment

means a temporary impairment of the functional ability to drive where there is little or no likelihood of a recurring episodic, or ongoing persistent, impairment. Examples of transient impairments are:

- the after-effects of surgery, e.g. the time to recover from the anesthetic and the surgery itself
- fractures and casts, post-orthopedic surgery
- concussion
- eye surgery, e.g. cataract surgery
- use of orthopaedic braces (including neck), and
- cardiac inflammation and infections.

Appendix 2: **Excerpts from the MVA**

Motor Vehicle Act **[RSBC 1996] CHAPTER 318**

Application for licence

25 (3) For the purpose of determining an applicant's driving experience, driving skills, qualifications, fitness and ability to drive and operate any category of motor vehicle designated for that class of driver's licence for which the application is made, the applicant must

(a) submit to one or more, as the Insurance Corporation of British Columbia may specify, of the following: a knowledge test; a road test; a road signs and signals test,

(b) submit to one or more, as the superintendent may specify, of the following: a vision test; medical examinations; other examinations or tests, other than as set out in paragraph (a),

(b.1) provide the corporation with information required to measure the applicant's driving experience, driving skills and qualifications,

(c) provide the superintendent with other information he or she considers necessary to allow the superintendent to carry out his or her powers, duties and functions,

(d) submit to having his or her picture taken, and

(e) if required by or on behalf of the corporation, identify himself or herself to the corporation's satisfaction.

(7) On receipt, in the respective forms required under subsection (1), of the application and the evaluation, and on being satisfied of the truth of the facts stated in the application, and that the prescribed fees and premium for the driver's certificate have been paid, and, subject to subsection (9), on being satisfied as to the driving experience, driving skills, qualifications, fitness and ability of the applicant to drive and operate motor vehicles of the relevant category, the corporation

must cause to be issued to the applicant a numbered driver's licence in the form established by the corporation authorizing the applicant to drive or operate a motor vehicle of the category designated for the class of licence applied for and a driver's certificate.

(9) In issuing any driver's licence or driver's certificate, the corporation, for those aspects of fitness and ability examined, tested or reviewed by the superintendent, must abide by the superintendent's instructions.

(12) Despite the regulations, the superintendent may require a statement in, endorsement on, or attachment to any person's driver's licence

- (a) restricting the hours of the day and the days of the week during which the person may drive a motor vehicle,

- (b) restricting the area in which the person may drive a motor vehicle,

- (c) restricting the motor vehicle or class of motor vehicle that the person may drive,

- (d) restricting the number of passengers that the person may carry in a motor vehicle driven by the person, and

- (e) imposing other restrictions on or adding any conditions to the driver's licence of the person that the superintendent considers necessary for the operation of a motor vehicle by the person.

(13) The Insurance Corporation of British Columbia must ensure that a person's driver's licence reflects any restrictions and conditions imposed in respect of that licence by means of the appropriate statement in, endorsement on or attachment to that licence, in accordance with the requirements of the superintendent.

(15) A person who violates a requirement, restriction or condition prescribed under this section in respect of the person's driver's licence or who violates a restriction or condition stated in, endorsed on or attached to a driver's licence issued to the person under this section commits an offence.

Examination of licensees

29 The superintendent may require a person to whom a driver's licence has been issued to attend at a time and place for one or both of the following purposes:

(a) to submit to one or more of the following tests, to be conducted by the Insurance Corporation of British Columbia: a knowledge test; a road test; a road signs and signals test;

(b) to be otherwise examined as to the person's fitness and ability to drive and operate motor vehicles of the category for which he or she is licensed.

Prohibition against driving relating to fitness or ability to drive

92 If

(a) a person has been required under section 29 to submit to an examination and he or she

(i) fails to appear and submit to the examination, or

(ii) fails to pay the prescribed examination fee,

(b) the superintendent considers that a person is unable or unfit to drive a motor vehicle or to hold a driver's licence of a certain class,

(b.1) a person fails to comply with a condition imposed on his or her driver's licence under section 25.1 (2), or

(b.2) a person fails to attend or participate in and complete a program referred to in section 233 to the satisfaction of the superintendent as required by the superintendent,

then, with or without a hearing and even though the person is or may be subject to another prohibition from driving, the superintendent may

(c) prohibit the person from driving a motor vehicle, or

(d) direct the Insurance Corporation of British Columbia to

(i) cancel the person's driver's licence and to issue a different class of driver's licence to the person, or

- (ii) cancel the person's driver's licence without issuing a different class of driver's licence to the person.

Superintendent may delegate

117 (1) The superintendent may delegate any or all of the powers, duties and functions of the superintendent

(a) under this Act to persons appointed in accordance with section 118 (2), or

(b) under this Act, except Part 2.1, to the Insurance Corporation of British Columbia.

(2) The Insurance Corporation of British Columbia, in carrying out powers or responsibilities delegated to it under subsection (1), must act in accordance with any directives issued by the superintendent.

(3) For the purposes of subsection (2), the superintendent may issue general or specific directives.

Report of psychologist, optometrist and medical practitioner

230 (1) This section applies to every legally qualified and registered psychologist, optometrist and medical practitioner who has a patient 16 years of age or older who

(a) in the opinion of the psychologist, optometrist or medical practitioner has a medical condition that makes it dangerous to the patient or to the public for the patient to drive a motor vehicle, and

(b) continues to drive a motor vehicle after being warned of the danger by the psychologist, optometrist or medical practitioner.

(2) Every psychologist, optometrist and medical practitioner referred to in subsection (1) must report to the superintendent the name, address and medical condition of a patient referred to in subsection (1).

(3) No action for damages lies or may be brought against a psychologist, an optometrist or a medical practitioner for making a report under this section, unless the psychologist, optometrist or medical practitioner made the report falsely and maliciously.

Appendix 3: Aging Drivers

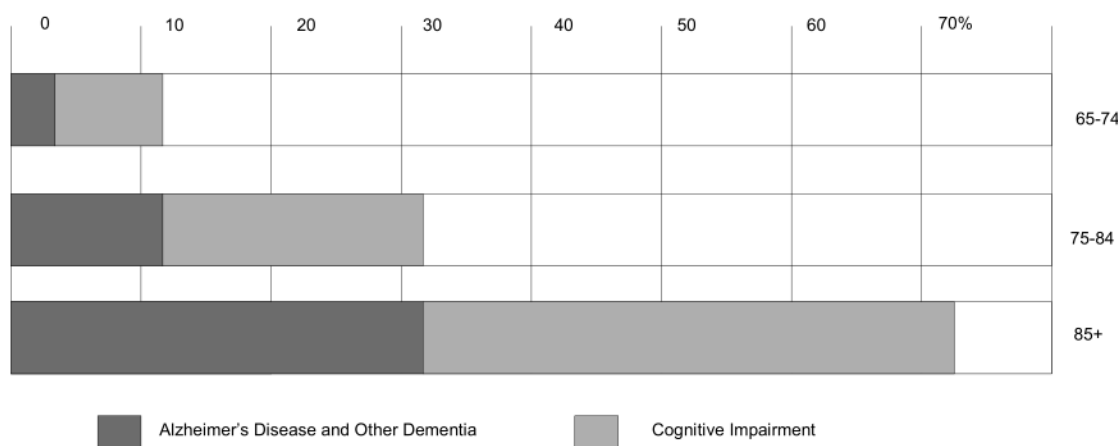
About aging drivers

As with the general population in Canada, the driving population is aging. The functional declines associated with aging are well documented. These functional declines in healthy aging drivers are unlikely to lead to unsafe declines in driving performance, except in the case of extreme old age.

However, aging is also associated with increased risk for a broad range of medical conditions, such as visual impairments, musculoskeletal disorders, cardiovascular disease, diabetes, and cognitive impairment and dementia. These medical conditions and medications used to treat them may affect fitness to drive.

Although there are many age-associated medical conditions that may affect driving, there is a particularly strong association between cognitive impairment and dementia and impaired driving performance. A large, national population-based study done in Canada in 1991 showed that 25% of the population 65 and older have some form of cognitive impairment or dementia, rising to 70% for those 85 and older.

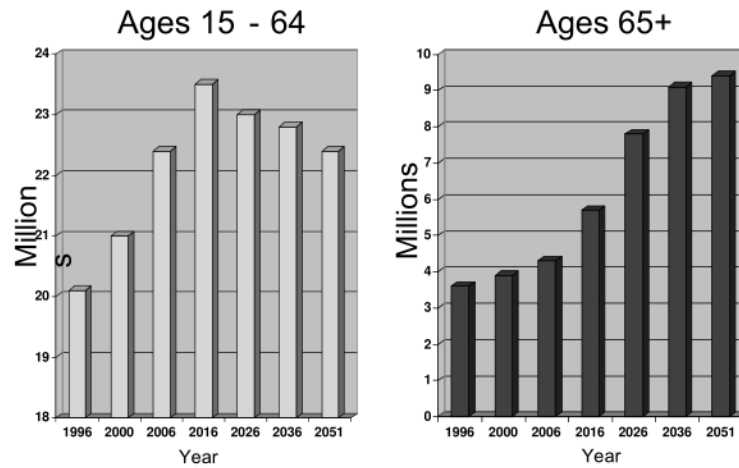
Prevalence of Cognitive Impairment



Demographics

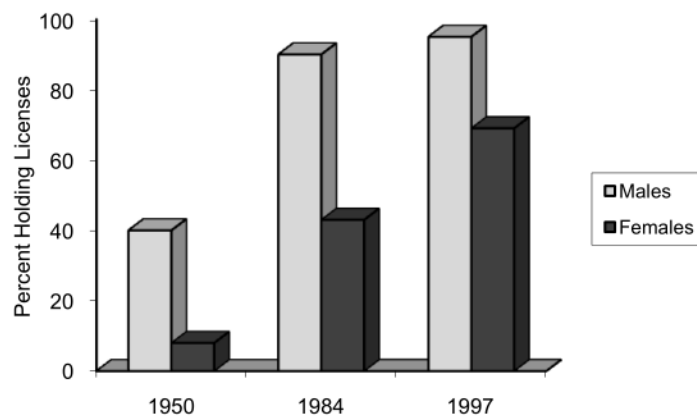
The number of people in Canada over the age of 65 increased from 3.5 million in 1996 to 4.2 million in 2006. By 2051, it is projected to be more than 9 million.

Population Change



Source: Statistics Canada, 2002

These increases are reflected in the driving population, with the percentage of drivers who are older increasing over time. Increases in the percentage of older women who have a driver's licence will also have an impact. Currently, 50% of females over the age of 65 are licensed to drive; in 2031 it is projected to be 85%.

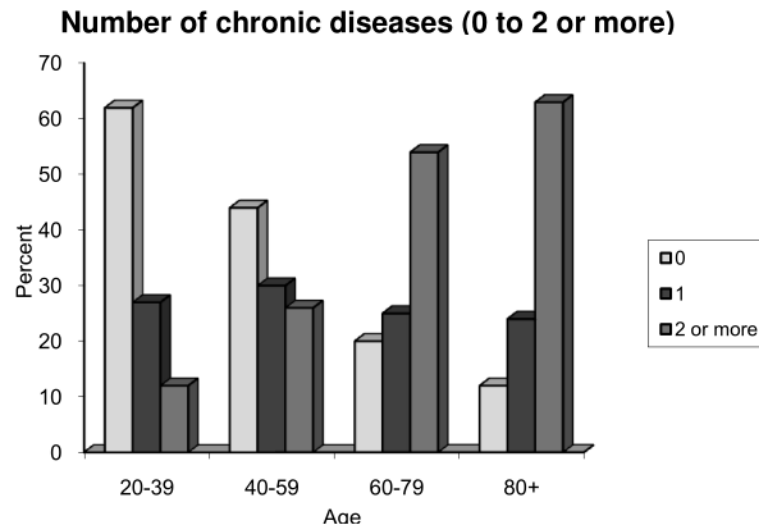


Source: Rosenbloom, 1998

Aging and multiple medical conditions

Because of the association between age and many chronic medical conditions, aging drivers are more likely to have one or more of these conditions. A 2003 survey found that 33% of Canadians age 65 and older had 3 or more chronic medical conditions, compared with 12% of younger

adults. The survey also found that the average number of chronic conditions increases with age.



Source: Rapoport, Jacobs, Bell & Klarenbach (2004)

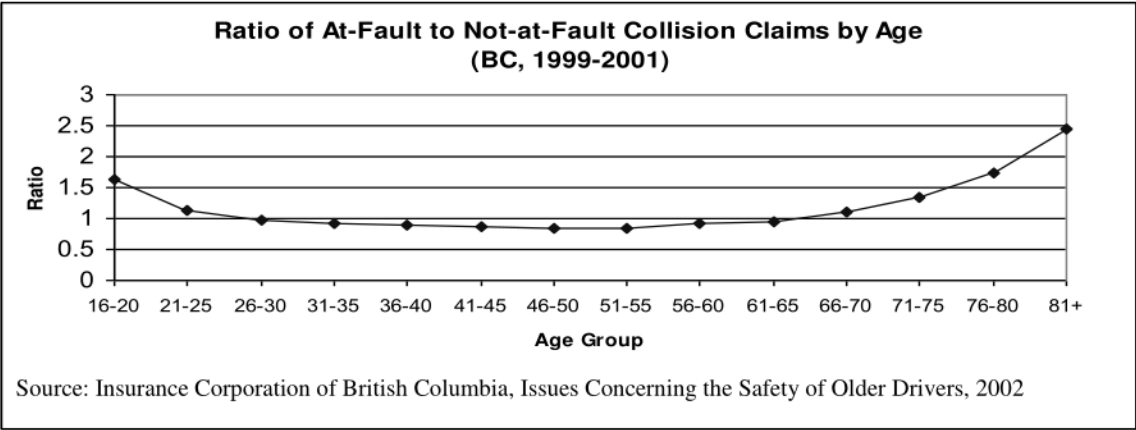
With an increased rate of multiple medical conditions, there is also a greater likelihood that aging drivers will be taking multiple medications (polypharmacy). With each additional medication taken, there is an increased risk of side effects and adverse interactions between medications, which may affect fitness to drive. While in many cases the adverse effects may be temporary or avoidable, where specific medications or dosages are required there may be a persistent impairment of the functions needed for driving.

Aging and adverse driving outcomes

As a group, older drivers are less likely to be involved in a crash than other age groups. However, the reason for this is that older drivers spend less time driving than others. When driving exposure is considered, older drivers show an increased crash risk, an increased risk for at-fault crash, and an increased risk of being injured and dying in a crash.

Statistics from ICBC indicate that older drivers are involved in a disproportionate number of at-fault crashes. The chart below shows the ratio of at-fault (50% liable) to not-at-fault crashes for different age groups. Drivers between the ages of 16 and 20 have more than 1.5 times the average at-fault versus not-at-fault crashes. Drivers in the 30 to 65 age group have a lower-than-average at-fault crash ratio. At about age 70, the

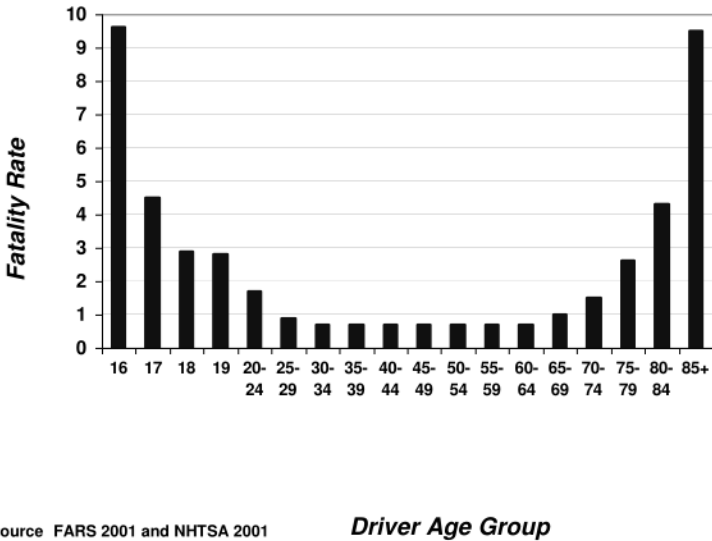
ratio of at-fault crashes begins to rise, climbing to 2.5 for drivers who are 81 and older.



An examination of driver fatality rates, adjusted for driving exposure, indicates that there are two high risk age groups: ages 16 to 19 and 65 and older. Older drivers are also more likely to be injured in a crash and to incur more severe injuries than younger drivers. The higher injury and fatality rates of older drivers is, in part, attributable to an increased susceptibility of older people to injury and death.






Unlike younger driver crashes, most traffic fatalities involving older drivers occur during the day time, on week-days, and in safe road conditions, with the majority of the crashes involving another vehicle.





Driver Fatality Rate (per 100 million VMT)



Appendix 4: Licence Classes

The table below describes the classes of B.C. driver licences.

| Class | Typical Vehicles |
|--|---|
|  Class 1 | Semi-trailer trucks and all other motor vehicles or combinations of vehicles except motorcycles |
|  Class 2 | <ul style="list-style-type: none"> Buses, including school buses, special activity buses and special vehicles Trailers or towed vehicles may not exceed 4,600 kilograms except if the bus and trailers or towed vehicles do not have air brakes Any motor vehicle or combination of vehicles in Class 4 |
|  Class 3 | <ul style="list-style-type: none"> Trucks with more than two axles, such as dump trucks and large tow trucks, but not including a bus that is being used to transport passengers Trailers may not exceed 4,600 kilograms except if the truck and trailers do not have air brakes A tow car towing a vehicle of any weight A mobile truck crane Any motor vehicle or combination of vehicles in Class 5 |
|  Class 4 (unrestricted) | <ul style="list-style-type: none"> Buses with a maximum seating capacity of 25 persons (including the driver), including school buses, special activity buses and special vehicles used to transport people with disabilities Taxis and limousines Ambulances Any motor vehicle or combination of vehicles in Class 5 |
|  Class 4 (restricted) | <ul style="list-style-type: none"> Taxis and limousines (up to 10 persons including the driver) Ambulances Special vehicles with a seating capacity of not more than 10 persons (including the driver) used to transport |

| Class | Typical Vehicles |
|--|--|
| | <p>people with disabilities</p> <ul style="list-style-type: none"> Any motor vehicle or combination of vehicles in Class 5 |
|  Class 5 or 7 | <ul style="list-style-type: none"> Two axle vehicles including cars, vans, trucks and tow trucks Trailers or towed vehicles may not exceed 4,600 kilograms Motor homes (including those with more than two axles) Limited speed motorcycles and allterrain vehicles (ATVs) Passenger vehicles used as school buses with seating capacity of not more than 10 persons (including the driver) Construction vehicles Three-wheeled vehicles - does not include three-wheeled motorcycles (trikes) or motorcycle/sidecar combinations Does not include Class 4 vehicles or motorcycles |
|  Class 6 or 8 | <p>Motorcycles, all-terrain cycles, allterrain vehicles (ATVs)</p> |
|  Class 4 or 5 with heavy trailer endorsement (code 20) | <ul style="list-style-type: none"> Trailers or towed vehicles exceeding 4,600 kilograms provided neither the truck nor trailer has air brakes Any motor vehicle or combination of vehicles in Class 5 |
|  Class 4 or 5 with house trailer endorsement (code 51) | <ul style="list-style-type: none"> Recreational (house) trailers exceeding 4,600 kilograms provided neither the truck nor trailer has air brakes Any motor vehicle or combination of vehicles in Class 5 |

Appendix 5: **Drafting and Approval Process**

Each medical condition chapter was drafted using the following process:

1. Dr. Bonnie Dobbs, University of Alberta provided updated research regarding the medical condition and driving.
2. The chapter was revised by OSMV based on Dr. Dobbs' research as well as a review of the Canadian Medical Association's (CMA) *Determining Fitness to Drive – A Guide for Physicians*, and the Canadian Council of Motor Transport Administrators (CCMTA) National Safety Code (NSC).
3. Specifically identified subject matter experts reviewed the draft chapter and provided feedback for revisions.
4. The draft was published on the BCMA web site for review by physicians and on drivesafe.com for review by stakeholders and the broader road safety community.
5. The chapter was further revised and ultimately approved by the OSMV and the BCMA.

The Relationship between BC Driver Fitness Policy and Policy in Other Jurisdictions

The relationship between BC driver fitness policy and the Canadian Council of Motor Transport Administrators (CCMTA) Medical Standards for Drivers

All Canadian provinces and territories have the authority to establish their own driver fitness policies. In order to support a consistent approach to driver fitness across the country, CCMTA publishes the Medical Standards for Drivers (formerly called the National Safety Code).

The CCMTA Medical Standards are developed by medical advisors and administrators from Canadian provincial driver licensing bodies. The standards are intended as a guide in establishing basic minimum medical qualifications to drive for both private and commercial drivers and are intended for use by both physicians and regulators.

Although no jurisdiction in Canada is required to adopt the CCMTA Medical Standards, the majority are adopted by the provincial and territorial motor vehicle licensing departments. This achieves a uniformity of standards across Canada.

The relationship between BC driver fitness policy for commercial drivers, the CCMTA Medical Standards and the North American Free Trade Agreement

Under the North American Free Trade Agreement, the United States and Canada reached agreement on reciprocity of the medical fitness requirements for drivers of commercial motor vehicles effective March 30, 1999. The countries determined that the medical provisions of U.S. Federal Motor Carrier Safety Regulations (FMCSRs) and - what was then - the Canadian National Safety Code (NSC) are equivalent.

The exception however is that Canadian drivers who are insulin-treated diabetics, who are hearing-impaired, or who have epilepsy are not permitted to operate commercial motor vehicles (CMVs) in the United States. U.S. regulations prohibit individuals with those conditions from operating CMVs in the United States. They are allowed to drive commercial vehicles in Canada.

Because the reciprocal agreement between the United States and Canada identifies the CCMTA Medical Standards as the standard for commercial

drivers, this means that **BC commercial drivers must meet or exceed the CCMTA Medical Standards if they drive in the United States.**

The driver fitness guidelines in this manual for commercial drivers who are insulin-treated diabetics, hearing-impaired, or who have epilepsy clearly state where the BC guidelines are different from the CCMTA Medical Standards for Drivers and the U.S. Federal Motor Carrier Safety Regulations (FMCSRs) and the implication for BC commercial drivers with these conditions who want to drive in the U.S.

...to balance
individual fairness with public
safety for all road users.

If your driver's licence is
cancelled, or if you decide to
retire from driving yourself, family
and community support can
ease your transition into driving
retirement. Resources may be
available at your local community
centre or senior centre.

DriveABLE is a research-based
assessment to determine your
cognitive medical fitness-to-drive.

The in-office cognitive assessment
was developed through extensive
research that compared the
driving abilities of hundreds
of cognitively impaired and
medically healthy drivers. Your
test performance is compared
against the performance of many
others your own age.



DriveABLE

In-Office Assessment

Office of the Superintendent
of Motor Vehicles

BRITISH
COLUMBIA

Office of the Superintendent of Motor Vehicles

PO Box 9254 Stn Prov Govt

Victoria BC V8W 9J2

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<http://www.pssg.gov.bc.ca/osmv/>

An Information
Guide



Your Driving Abilities Can Change

Driving requires complex cognitive abilities. Drivers with medical conditions or who are on multiple medications can experience changes to their driving abilities. Even drivers with excellent past driving records can become unsafe to drive. No one wants to drive if they are a danger to themselves or others on the road.

Drivers are referred to the Superintendent of Motor Vehicles primarily by physicians after a medical assessment raised concerns about their cognitive functioning and continued ability to drive safely.

"DriveABLE is not like a traditional ICBC driving test, it's an assessment of cognitive abilities specific to driving."

The assessment is presented on a touch sensitive screen (see bottom right photograph). You only need to touch the screen or push a button to respond. You do not need to be familiar with computers. You will not be asked to use a keyboard or a mouse.

The assessment will take approximately an hour. You will be given opportunities to practice before each task begins.

You will be asked to proceed only when you have shown the evaluator that you understand the task and are ready.

On the day of your assessment, please:

- o Have someone drive you.
- o Bring your driver's licence.
- o Bring your reading and/or driving glasses.
- o Bring your referral letter from the Office of the Superintendent of Motor Vehicles.



Cut points

Tuesday, January 3, 2012

2:49 PM

| Range of Possible Scores | | |
|------------------------------|-----------------------------|-------------------|
| 0 - 29% | 30% - 70% | 71% - 100% |
| Normal range | Inconclusive | Impaired |
| No Immediate Action Required | On-road evaluation required | Driving Cessation |



Office of the Superintendent of Motor Vehicles

DriveABLE In-Office Assessment

Fact Sheet

Driving, Medical Conditions, and Public Road Safety

Driving is a complex task that requires multiple cognitive abilities. If someone has a medical condition or is on medication their ability to drive safely can be affected. Even drivers with excellent past driving records can become unsafe. The Superintendent of Motor Vehicles needs a way to accurately and safely determine whether or not a medical condition affects an individual's driving ability. That's what the DriveABLE assessment does for drivers with suspected cognitive impairment.

Who Needs to Take DriveABLE?

The requirement to undertake a DriveABLE assessment is un-related to the age of a driver. Not all seniors need to take a DriveABLE assessment. Only drivers with reported cognitive function concerns are referred by the Superintendent to take a DriveABLE assessment. Patients are referred primarily (95% of the time) by medical practitioners who have already conducted an in-office assessment and have concerns about their patients cognitive functioning and ability to continue driving safely.

The DriveABLE assessment should not be confused with the requirement for drivers at 80 years of age (and every two years after age 80) to complete a Driver Medical Examination Report (DMER) with their physician. The DMER is a regular review to identify any possible driver fitness issues that may require further follow-up or specialist assessment. Of the 130,000 driver medical fitness assessments completed by the Superintendent's office each year, only 1,500 (less than 2%) are required to take a DriveABLE cognitive assessment.

What is DriveABLE?

DriveABLE is a research-based, scientific assessment tool that evaluates driving errors related to cognitive impairment. It is used across North America, Australia, and New Zealand to help licensing authorities determine an individual's cognitive medical fitness to drive. The DriveABLE assessment was developed through extensive research comparing the abilities and driving of hundreds of medically safe and unsafe drivers and has been reviewed and approved by the British Columbia Medical Association.

The DriveABLE assessment is similar to an eye or hearing assessment; you cannot study to pass it. The assessment measures things like memory, attention span, reaction time, spatial judgement and decision making. The DriveABLE assessment measures these specific cognitive functions needed for safe driving. It does not measure a person's overall cognitive functioning or intelligence. Results are judged against someone without a cognitive impairment of the same age.

The DriveABLE in-office assessment is presented on a computer screen and takes approximately an hour to complete. The Superintendent recognizes that some individuals lack computer proficiency and that the prospect of taking an assessment can cause individual stress. However, no knowledge of computers or their applications are needed. An individual only needs to touch the screen and press a button to complete the tasks. A mouse and a keyboard are never used. A trained healthcare professional (typically a kinesiologist or occupational therapist) administers the DriveABLE assessment and guides the individual the whole time. Practice sessions are encouraged. During the practice session, if the healthcare professional perceives an individual to be highly nervous or overly stressed, they will suggest that the individual re-book an appointment for another day. During the assessment, the healthcare professional will not let the individual take the next task until they fully understand what is expected of them.

The DriveABLE Process

1. The Superintendent receives a report (95% of the time from a physician; other times from a police officer or family member) because an individual is thought to have a medical condition that makes them unsafe to drive.
2. The Superintendent either: (a) makes a licensing decision based on the information received , or (b) requests additional medical information or refers an individual for specific medical tests or assessments.
3. In the case of suspected cognitive impairment the individual is referred to take an in-office DriveABLE assessment. The Superintendent covers the cost and the individual may book an appointment at a DriveABLE service provider centre: 1-888-475-4666.
4. The individual takes an office based DriveABLE assessment within 30 days of the Superintendent's letter. A secondary on-road cognitive assessment is only used for individuals who score neither a clear pass nor a clear fail on the in-office assessment. This secondary test would be scheduled on another day within 30 days of the in-office assessment.
5. DriveABLE results are submitted to both the Superintendent and the individual's physician.
6. The Superintendent reviews medical information on file, the results of any in-office medical assessment by a physician, and the DriveABLE assessment results and notifies the individual in writing about the licensing decision.

Why is DriveABLE an in-office assessment?

The in-office assessment was developed through extensive research comparing the abilities and driving of hundreds of medically safe and unsafe drivers. The in-office assessment is a public safety advancement because it reduces the risk involved in requiring people identified as having a possible cognitive impairment from having to take a DriveABLE road test on public roads. A traditional ICBC on-road test also only tests general driving skills and knowledge of the rules of the road and does not test for the relationship between cognitive function and driving ability.

Why do some individuals get to take an on-road DriveABLE assessment?

DriveABLE on-road assessments are used only in instances where an individual has scored an intermediate result (neither a clear pass nor a clear fail) on the in-office assessment. For safety reasons, the on-road assessment takes place on a designated assessment route in a dual-controlled vehicle with a DriveABLE examiner. Minor handling errors or bad habits are not part of the on-road scoring. Only errors related to cognitive ability are scored.

Appeals Process

Individuals who fail DriveABLE and have their licence removed may apply to retake a subsequent DriveABLE assessment. However, it should be noted that individuals cannot study or practice to pass a DriveABLE assessment and subsequent re-assessments would be at their own expense.

The Superintendents' office will always consider new medical information – e.g. an improvement in a medical condition, changes to prescription medications, or additional physician advice. Individuals may also write to the Superintendent to appeal a licensing decision.

Support Resources

Support resources are available to help individuals transition into driving retirement.
BCAA Traffic Safety Foundation: www.tsfbcaa.com | 1-604-298-5107

DriveABLE Intake and General Info

Intake and Assessment Issues:

It goes without saying that all clients coming for an assessment should be as healthy as possible at the time of the assessment. Any rehabilitation or physical therapy should be completed prior to being assessed. Post surgical patients should wait to be assessed until they have fully recovered from surgery. Below are some intake and assessment issues that you may encounter:

Physical concerns:

- It is always important to determine on intake if the client has any physical difficulties that may preclude them from being assessed by DriveABLE. For the DCAT assessment it would be important to know if the client had any difficulty using hands or arms.
- Also as the results of the DCAT could recommend the on-road assessment (DORE), it is important to establish at the start whether the client would be able to do the road test without requiring adaptive equipment.
- Below are questions to ask on intake:
 - Would you have any difficulty reaching out your arm and touching a screen or pushing a button?
 - Would you have any difficulty getting into and seating yourself onto the driver side seat of a standard mid-size passenger vehicle? (Please note that obesity can be a factor here in addition to any mobility problems.)
 - Do you have any physical problems that might make it difficult for you to use the brake and/or accelerator of a mid-size automatic passenger vehicle?
 - Do you have any physical problems that might make it difficult for you to turn the steering wheel, put on the signal lights or use the gear shift?
- If the answer to any of these questions is yes, these clients should be redirected to Occupational Therapists specializing in vehicle adaptations and retraining for disabled drivers

Client wishes to be reassessed:

- Sometimes clients (or families) call to ask for another assessment. This can occur for a variety of reasons. The most common scenarios are:
 - The client does not agree with the assessment outcome;
 - The client did not like the evaluator;
 - The client did not think the test was fair, the room was too dark, the tests were too difficult, or they did not understand what to do;
 - The client feels that their health has improved;
 - Family feels that the client's health has declined.
- When would a reassessment be appropriate: In general, a reassessment is appropriate if the client's health has changed sufficiently (for the better or worse) to warrant a reassessment or if the client's health is expected to decline and repeat assessments are part of a monitoring process.
- In all cases, the client would need another referral from their physician indicating that there has been a change in medical status warranting a new assessment. The change in medical status also should be reported to OSMV by the physician.
- Sometimes a client wishes to pay for another assessment out of their own pocket. In these cases, the client should be advised that the assessment can be repeated if their physician agrees that a reassessment is warranted on the basis of a change in medical status. A new physician referral would be required before reassessment.

English as a second language:

- Some clients may not speak English or have very limited English. If this is the case, use the translation protocol to assess the client. Additional time will need to be allowed for the assessment. If the client is able to demonstrate during the practice for each task that they understand and can do the task, consider the assessment valid.
- For some clients, English is a second language and while speech may sometimes be hesitant, there is good comprehension. If the client does not seem to have difficulty understanding during the consent process, try to administer the assessment without using the translation protocol. If the client is able to demonstrate on the practice for each task that they understand and can do the task, continue with the assessment in English. If they do not demonstrate an understanding of the task, stop the assessment and use the translation protocol. This may mean rebooking the assessment if more time needs to be allowed for the assessment.

Illiterate Clients:

- Not being able to read should not prevent a client from being assessed. There are two language dependent tasks: Span of Attentional Field and Identification of Driving Situations. Use the translation protocol to administer all tasks, but of course use English, to test these clients allowing for additional time for testing. If the client is able to demonstrate during the practice on each task that they understand and can do the task, consider the assessment valid.

Client has an essential hand tremor, Parkinson's disease or MS but meets criteria on physical intake questions:

- While DriveABLE frequently assesses clients who have an essential tremor, MS or Parkinson's disease, the concern for these clients is that they often present with slowed or, in the case of an essential tremor, with shaky movements that can affect tasks that are timed. Our policy has been to give these clients the DriveABLE on-road evaluation when the DCAT overall score falls just over into the fail range or it is felt by the evaluator that the tremor or slowness interfered sufficiently that the test results should be considered invalid.
- If the client is an OSMV referral, the on-road evaluation will need approval by OSMV and will require documentation as to why the road evaluation is being requested.

Client has gait and balance concerns, but meets criteria on physical intake questions:

- Occasionally, you may have a client who presents with gait and balance problems often due to a stroke, but they do not have difficulty maintaining a seated upright posture and would not have problems with gears, brakes or accelerator. When there is no cognitive impairment, these clients do well on the DCAT. The concern is whether they will have any problems on-road. Not being able to safely maintain a steady position on the road (driving like walk) is what is often seen when these clients are taken out on the road. Our recommendation is that the on-road evaluation be given even though the client is showing no cognitive impairment for driving on the DCAT.

Client has hearing problems:

- A client with hearing problems can be challenging to assess. If the client uses a hearing aid, it is important to remind them to wear it to the assessment. Higher pitches are often less discernable to the hearing impaired, so lower the pitch of your voice when speaking louder. If the client is able to demonstrate during the practice on each task that they understand and can do the task, consider the assessment valid.

Client has great difficulty doing tasks:

- All tasks must be attempted and completed whenever possible.
- Sometimes a client simply will not be able to complete a task, despite your best efforts, because the medical condition has reduced their abilities beyond the level needed for this task.
- Nevertheless, there are some tasks that **must** be completed in order to score and print a report. The following tasks **MUST** be completed in order to score and print a report:
 - **Motor Speed and Control**
 - **Executive Function**

o **Spatial Judgment and Decision Making**

If the client is unable to do these tasks, a report will be produced indicating that the client is unable to do the assessment. No scores will be produced. A recommendation will be made for driving cessation.

Frequently Asked Questions

What is DriveABLE?

DriveABLE is an assessment of cognitive abilities necessary for driving and an on-road evaluation. It was developed through extensive university research as an objective and fair assessment for drivers who have medical conditions that might change cognitive abilities.

How do I respond to "I've driven for a long time and never had an accident"?

It is important to recognize that the client is an experienced driver. Acknowledge the years of experience and remind the client that medical problems/treatments can interfere with the ability to drive. The assessment is important, as it is the best way to see if there are any difficulties.

I would like my Dad to fail this assessment.... Or ... He is a good driver. Why is this test necessary?

Some concerned families are anxious to have the client no longer drive or may feel that the client is a safe driver and that the evaluation is an unwanted intrusion. It is important to remind the family that medical conditions can impair the ability to drive and that the assessment is the best and most fair way of seeing if there are any difficulties.

How do I respond to "I think you are just "picking on old people".

Most older drivers are safe drivers. But driving skills can change when a person has an illness. And it is the illness and the possible effect it may have on driving that is of concern. This is why it is necessary to have a driving assessment to be sure the illness has not caused driving abilities to change.

What is cognitive impairment and how does that affect driving?

Mental abilities such as attention, memory, decision making, and judgment are a part of cognition. It is not surprising that when these abilities are compromised, driving can become dangerous. Sometimes with cognitive impairment, there can also be a loss of insight and the person is not aware that their driving has become dangerous.

I've been driving for an eternity and I have an excellent driving record/never had an accident/never had a ticket. Why do I need to have this test?

Or... I've driven with him/her and I don't think s/he has a problem. Why does there need to be a test?

Sometimes a person can have an excellent driving record but a medical condition or treatment can change the driving ability of even the best drivers. Doctors and licensing authorities need a way to accurately evaluate whether or not that medical condition is affecting driving ability. The DriveABLE assessment was developed through extensive research to be accurate, objective, and fair. If s/he/you is not having difficulties driving that will be demonstrated in the assessment.

Can my daughter/spouse/son/neighbor come in the assessment room with me?

We prefer that you and the evaluator work together during the assessment. It is important that you concentrate on the tasks without being distracted.

What do these tests have to do with driving?

These tasks test specific skills you use while driving. For example, being able to respond accurately and quickly would be important in driving for avoiding collisions and dangerous situations.

I don't know anything about computers. Will that affect my results?

No prior knowledge of computers is required for this assessment. All you need to do is touch a screen in front of you or press a button.

How am I doing on these tests?

I honestly don't know. I know you are giving me your best effort and I appreciate that. Please just continue to do your best.

I don't think the assessment is good because it was on a computer/because the tasks were too difficult/instructions weren't clear.

The DriveABLE assessment was developed through years of extensive research. It is designed so that competent drivers pass, while unsafe drivers are identified. The tasks are designed specifically to measure driving skills that are necessary for safe driving. While we do use a computer to present the tasks, no computer knowledge was required; you needed only to touch a touch sensitive screen or press a button in front of you to respond which is no different than if I put a piece of paper on a table and asked you to touch the paper. During the testing you practiced each task and showed that you understood and were able to do the task.

MMSE, MOCA

Wednesday, March 17, 2010
7:38 AM

Determining how to adjudicate cases based on MMSE, MOCA score and/or diagnosis or suggestion of a Cognitive Impairments.

Until the SMARD is ready for use, the following guidelines will be used:

- 1) (Revised June 19/12 to reflect current practice) Where physician has specifically stated the presence of some degree of cognitive impairment (e.g. "mild cognitive impairment", "dementia" etc) the driver will be required to complete a DriveABLE assessment. If this information is provided and the physician states unfit, expresses concerns for safety, or if there is additional information that indicates that there are significant concerns, then the DL will be cancelled and the client will be offered the following remedy: "This decision will be reviewed if you submit new information demonstrating an improvement in your medical condition. The information required is a current medical report from your physician specifically addressing the nature and extent of the improvement in your cognitive function, including, where possible, an opinion as to the reason for this improvement."
- 2) Where there a MMSE or MOCA score is provided, **with no other information**, the following parameters will be used:
 - All drivers with a MMSE score of 28 -30 or MOCA score of 26-30 can be found fit.
 - All drivers with MMSE score of 27 to 17, or a MOCA score of 25 to 17 will be required to complete a DriveABLE assessment.
 - All driver with a MMSE or MOCA score of 16 or less, will be cancelled and offered a remedy of DriveABLE.
- 3) Where neither a MMSE, MOCA score, nor a diagnosis of cognitive impairment is provided, but there is direct or collateral information indicating concern regarding a driver's cognitive function, these cases will need to be adjudicated on an individual basis.

All Cognitive screening test scores must always be considered in the context of all of the information contained within the case as well as the driving record. When the results of other types cognitive screening assessment are submitted, these cases will have to be considered on an individual basis.

DriveABLE assessments are valid for private vehicle licencing only (class 5-8).

Cognitive impairments due to dementing illnesses are always progressive. Unless a routine over 80 DME is due within a year, a 1 yr follow up DME should be programmed when finding these client's fit.

[Back to Policy: Cognitive Impairment and Dementia](#)

[Chapter 6 Assessment Policies](#)

Appendix C

Standardized Mini Mental State Examination (SMMSE) Cont'd

Table 1. Stages of Cognitive Impairment as Defined by SMMSE Scores

SCORE DESCRIPTION STAGE DURATION (Years)

30-26 Could be normal Could be normal Varies

25-20 Mild Early 0 to 23

19-10 Moderate Middle 4-7

9-0 Severe Late 7-14

Table 2. Areas of Functional Impairment

SMMSE SCORE ACTIVITIES OF DAILY LIVING COMMUNICATION MEMORY

30-26 Could be normal Could be normal Could be normal

25-20 Driving, finances, shopping Finding words, repeating, Three-item recall,

going off topic orientation to time then place

19-10 Dressing, grooming, toileting Sentence fragments, vague Spelling WORLD backward,

terms (i.e. this, that) language, and three-step command

9-0 Eating, walking Speech disturbances such as Obvious deficits in all areas

as stuttering and slurring

Adapted from Vertesi A, Lever JA, Molloy DW, et al. Standardized mini-mental state examination Use and interpretation. Canadian Family Physician 2001;47:2018-2023.

SIMARD: Cut Points

In recognition of the fact that the OSMV is currently receiving the results of SIMARD assessments, you may make the following Driver Fitness decisions based on the SIMARD score:

- SIMARD Score ≤ 30 (High Probability of failing a driving assessment) : Cancel the driver's licence and offer the remedy of a DriveABLE assessment.
- SIMARD score 31-70 (Referral for a driving assessment recommended): Refer the driver for a DriveABLE assessment.
- SIMARD score 71-130 (Low Probability of failing a driving assessment): The driver is fit to drive.

[Policy: Cognitive Impairment and Dementia](#)

[Chapter 6 Assessment Policies](#)