



ROADSAFETYBC

**2016 CCMTA Medical Standards for Drivers
With BC Specific Guidelines**

Foreword

The **2016 Canadian Council of Motor Transport Administrators (CCMTA) Medical Standards for Drivers with BC Specific Guidelines (2016 BC Guide)**, has been developed based on Version 13 of *The CCMTA Medical Standards for Drivers* and has been supplemented with British Columbia (B.C.) specific information and guidelines. Through a consultation process in the fall of 2015, the RoadSafetyBC Driver Fitness Advisory Group and subsequently the Doctors of BC Emergency Medical Services Committee (EMSC) endorsed the recommendation for RoadSafetyBC to adopt the CCMTA Guide. Effective April 1, 2016 RoadSafetyBC has adopted the **2016 BC Guide** in place of the *2010 BC Guide in Determining Fitness to Drive*.

The CCMTA is the official organization in Canada for coordinating all matters dealing with the administration, regulation and control of motor vehicle transportation and highway safety. Its national framework includes representatives from provincial, territorial and federal governments and provides collaborative leadership in addressing Canadian road safety priorities. In 2013, based largely on the BC Guide, the CCMTA published national medical standards for drivers. The CCMTA Standards are nationally supported by CCMTA resources and infrastructure.

The CCMTA framework includes a process for regular input from licensing authorities, clinicians and researchers from across Canada. The standards are reviewed annually and updated to ensure they remain current and reflect existing medical opinion and advances in research and knowledge; they focus on functional ability to drive rather than medical diagnosis, and respond to case law establishing that Canadian authorities must individually assess drivers.

RoadSafetyBC has supplemented the CCMTA Standards with BC specific guidelines for assessment parameters and reassessment intervals. These guidelines are directly inserted into the medical condition chapters. Additional BC specific content has also been added to the sections preceding the medical standards.

The **2016 BC Guide** is the decision guiding tool used by RoadSafetyBC in determining driver licence status and is available as a reference for medical practitioners when they are assessing driver fitness for RoadSafetyBC. The Canadian Medical Association (CMA) Drivers Guide continues to be a clinical reference for medical practitioners when they are counselling patients regarding driving.

Additional reference materials and support for medical practitioners will still be available through, College of Physicians and Surgeons, the Canadian Medical Protective Association (CMPA), and RoadSafetyBC.



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Version History

Document Information and Revision History			
<i>Project</i>		Create BC SPECIFIC PARAMETERS within the CCMTA GUIDE	
<i>Title</i>		CCMTA Medical Standards for Drivers with BC Specific Guidelines 2016	
<i>Version</i>		January 2016	
<i>Status</i>		In-Progress	
HISTORY			
	<i>Date</i>	<i>Changes made by:</i>	<i>Description of Change</i>
Version 1	April 1, 2016		CCMTA Standard adopted

**Overview of Differences between the
2016 CCMTA Medical Standards for Drivers with BC Specific Guidelines
and 2010 BC Guide in Determining Fitness to Drive**

Part I BACKGROUND:

- Added Chapter 1.2 : The Authority for The CCMTA Standards (pages 21-24)
- Revised /Updated Stats: Driver Medical Fitness Program Overview in Chapter 1.3 Section 1.3.2 (pages 27-29)
- Added - the role of the BC Driver Fitness Advisory Group (DFAG) under Chapter 1.3 Section 1.3.3 (page 30)
- Added –the role of Nurse Practitioners in accordance to recent addendum to Section 230 of MVA under Chapter 1.3 Section 1.3.3 (page 30) and in Chapter 2.2 Section 2.2.1 (page 44)
- Added – Administrative Fairness Principle_ post-Wong decision under Chapter 1.4 Sections 1.4.1 and 1.4.2 (pages 33-35)
- Case managers now referred to as nurse case managers

Part 2 POLICIES AND PROCEDURES:

- Revised Policy regarding Cancelling or Restricting a licence under Chapter 2.2 Section 2.2.6 (p51)
- References to DriveABLE have been changed to cognitive road test (Sections 2.3.5 on page 57 and 2.3.6 on page 61; Assessment Flowchart page 66; and Section 2.4.4 on page 70; 2.4.14 Determination Procedure flowchart on page 86)
- Added Policy regarding Urgent Cancellation Review Process (UC /NTC) under Chapter 2.4 Section 2.4.12 (page 83)

PART 3 CCMTA MEDICAL STANDARDS FOR DRIVERS with BC Specific Guidelines

- The chronology of medical chapters is now the same as CCMTA's Guide.
- The BC specific Introduction content Section 1.2 on page 93 has been added.
- The Guideline for Assessment Table has been revised with BC Specific content on page 95.
- The CCMTA Medical Standards for Drivers have been adopted. The specific guidelines the jurisdiction will use operationally to assess and determine driver fitness in order to be licensed in BC have been inserted.
- Embedded within the CCMTA's Guideline for Assessment Table in Part 3 Medical Standards are :

1. **BC Specific Guidelines** - this section outlines the guidelines that RoadSafetyBC will use operationally to assess and determine driver fitness in order to be licensed in BC. Note: references to DriveABLE have been changed to cognitive road test.
2. **BC Specific Conditions or Restrictions** – this section outlines any conditions or restrictions that RoadSafetyBC may impose on an individual who is found fit to drive.
3. **BC Specific Reassessment** - this section outlines the re-assessment policy for individuals who are found fit to drive.
4. **BC 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.

PART 4 APPENDICES

- Glossary of Terms and 2010 Drafting Process were removed
- Revised Appendix 4 excerpts from MVA section 230 to include Nurse Practitioner
- Added Appendix 2 Canada-US Reciprocity Agreement
- Added Appendix 6 BC Specific Content Changes

QUICK ACCESS TO SPECIFIC MEDICAL TABLES:

Chapter	Specific Medical Tables
Chapter 3: Cardiovascular Disease and Disorders	<p>3.6.1 Congenital heart defects</p> <p>3.6.2 Acute Coronary Syndromes – Non-commercial drivers</p> <p>3.6.3 Acute Coronary Syndromes – Commercial drivers</p> <p>3.6.4 Asymptomatic coronary artery disease or stable angina</p> <p>3.6.5 CABG surgery – Non-commercial drivers</p> <p>3.6.6 CABG surgery – Commercial drivers</p> <p>3.6.7 Premature atrial or ventricular contractions</p> <p>3.6.8 Ventricular fibrillation with no reversible cause – Non-commercial drivers</p> <p>3.6.9 Ventricular fibrillation with no reversible cause – Commercial drivers</p> <p>3.6.10 Hemodynamically unstable VT – Non-commercial drivers</p> <p>3.6.11 Hemodynamically unstable VT – Commercial drivers</p> <p>3.6.12 Sustained VT and an LVEF of < 35% – Non-commercial drivers</p> <p>3.6.13 Sustained VT and an LVEF of <35% Commercial drivers</p> <p>3.6.14 Sustained VT and an LVEF of >35% Non-commercial drivers</p> <p>3.6.15 Sustained VT and an LVEF of >35% Commercial drivers</p> <p>3.6.16 Non sustained VT</p> <p>3.6.17 Paroxysmal SVT, AF or AFL with no impaired consciousness</p> <p>3.6.18 Paroxysmal SVT, AF or AFL with impaired consciousness</p> <p>3.6.19 Persistent or permanent paroxysmal SVT, AF or AFL</p> <p>3.6.20 Sinus node dysfunction</p> <p>3.6.21 Atrioventricular (AV) or intraventricular block – Non-commercial drivers</p> <p>3.6.22 Atrioventricular (AV) or intraventricular block – Commercial drivers</p> <p>3.6.23 Permanent pacemakers – Non-commercial drivers</p> <p>3.6.24 Permanent pacemakers – Commercial drivers</p> <p>3.6.25 Declined an ICD or have an ICD implanted as primary prophylaxis – Non-commercial drivers</p> <p>3.6.26 Declined an ICD or have an ICD implanted as primary prophylaxis – Commercial drivers</p> <p>3.6.27 ICD implanted as secondary prophylaxis for sustained VT – Non-commercial drivers</p> <p>3.6.28 ICD implanted as secondary prophylaxis for sustained VT – Commercial drivers</p> <p>3.6.29 ICD therapy (shock or ATP) has been delivered – Non-Commercial drivers</p> <p>3.6.30 ICD therapy (shock or ATP) has been delivered – Commercial drivers</p> <p>3.6.31 ICD implanted as secondary prophylaxis for VF or VT – Non-commercial drivers</p> <p>3.6.32 ICD implanted as secondary prophylaxis for VF or VT – Commercial drivers</p> <p>3.6.33 Inherited heart disease – Non-commercial drivers</p> <p>3.6.34 Inherited heart disease – Commercial drivers</p> <p>3.6.35 Medically treated valvular heart disease – Non-commercial drivers</p> <p>3.6.36 Medically treated aortic stenosis or aortic sclerosis – Commercial drivers</p> <p>3.6.37 Medically treated aortic or mitral regurgitation or mitral stenosis – Commercial drivers</p>

	3.6.38 Surgically treated valvular heart disease – Non-commercial drivers 3.6.39 Surgically treated valvular heart disease – Commercial drivers 3.6.40 Mitral valve prolapse – All drivers 3.6.41 Congestive heart failure – Non-commercial drivers 3.6.42 Congestive heart failure – Commercial drivers 3.6.43 Left ventricular dysfunction or cardiomyopathy – Non-commercial drivers 3.6.44 Left ventricular dysfunction or cardiomyopathy – Commercial drivers 3.6.45 Heart transplant – Non-commercial drivers 3.6.46 Heart transplant – Commercial drivers 3.6.47 Hypertrophic cardiomyopathy – Non-commercial drivers 3.6.48 Hypertrophic cardiomyopathy – Commercial drivers 3.6.49 Syncope 3.6.50 CCS recommendations regarding transient conditions (Waiting Periods)
Chapter 4: Cerebrovascular disease	4.6.1 Transient ischemic attack (TIA) 4.6.2 Cerebrovascular accident (CVA) 4.6.3 Cerebral aneurysm that requires surgical repair 4.6.4 Surgery to repair a cerebral aneurysm – Non-commercial drivers 4.6.5 Surgery to repair a cerebral aneurysm – Commercial drivers
Chapter 5: Chronic Renal Diseases	5.6.1 Stage 1 to 4 renal disease (Commercial and Non-Commercial) 5.6.2 Stage 5 – End-stage renal disease – All Drivers (Commercial and Non-Commercial) 5.6.3 Renal transplant
Chapter 6: Cognitive Impairment including dementia	6.6.1 Cognitive impairment or dementia 6.6.2 Severe Dementia
Chapter 7: Diabetes – Hypoglycemia	7.6.1 Type 2 diabetes – All drivers 7.6.2 Type 1 or type 2 diabetes treated with insulin – Non-commercial drivers 7.6.3 Type 1 or type 2 diabetes treated with insulin – Commercial drivers 7.6.4 Episode of severe hypoglycemia – Non-commercial drivers 7.6.5 Episode of hypoglycemia unawareness within past year – Non-commercial drivers 7.6.6 Persistent hypoglycemia unawareness – Non-commercial drivers 7.6.7 Episode of severe hypoglycemia – Commercial drivers 7.6.8 Episode of hypoglycemia unawareness in the last year– Commercial drivers 7.6.9 Persistent hypoglycemia unawareness – Commercial drivers 7.6.10 Summary Table of Diabetes Conditions and Driver Medical Standards 7.6.11 Doctor’s report on commercial driver with diabetes on insulin 7.6.12 Driver’s report – commercial driver with diabetes on insulin
Chapter 8: Frailty, weakness or general debility	8.6.1 Frailty, weakness or general debility

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Chapter 10: Intracranial tumours	10.6.1 Intracranial tumour
Chapter 11: Musculoskeletal	11.6.1 Loss of upper or lower extremities-All Drivers 11.6.2 Chronic musculoskeletal condition
Chapter 12: Neurological disorders	12.6.1 Neurological disorder
Chapter 13: Peripheral Vascular Diseases	13.6.1 Peripheral arterial disease 13.6.2 Abdominal aortic aneurysm or medically treated aortic dissection – Non- commercial drivers 13.6.3 Abdominal aortic aneurysm or medically treated aortic dissection – Commercial drivers 13.6.4 Surgically repaired abdominal aortic aneurysm or surgically treated aortic dissection 13.6.5 Deep vein thrombosis
Chapter 14: Psychiatric disorders	14.6.1 Psychiatric disorder– All drivers
Chapter 15: Psychotropic Drugs and Driving	15.6.1 Medication – Prescribed - All Drivers 15.6.2 Medication – Non Prescribed (Over the Counter) – All drivers 15.6.3 Substance Abuse or Dependence - All drivers 15.6.4 Alcohol and Driving – All drivers
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PART 1: BACKGROUND

Chapter 1.1: Introduction

1.1.1 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 1.1: Introduction, which explains the purpose of the Manual and developments that have influenced RoadSafetyBC's approach to driver fitness
- Chapter 1.2 The authority for the CCMTA standards, which provides an overview of the mandate of the CCMTA and the relationship between driver fitness policy in individual Canadian jurisdictions and the CCMTA standards
- Chapter 1.3: The BC Driver Medical Fitness Program, which provides an overview of the authority for, and activities of, the Driver Medical Fitness Program in British Columbia, as well as the roles and responsibilities of the various Driver Medical Fitness Program partners, and
- Chapter 1.4: Driver Medical Fitness Program Principles, which are the foundation for the policies and procedures

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

- Chapter 2.1: Introduction to the Policies and Procedures
- Chapter 2.2: Screening Policies. Because screening is largely conducted by RoadSafetyBC's Driver Fitness Program partners, procedures are not included in this chapter.
- Chapter 2.3: Assessment Policies and Procedures
- Chapter 2.4: Determination Policies and Procedures, and
- Chapter 2.5: Reconsideration Policies and Procedures

The third part of the Manual contains the medical condition chapters. The first chapter in this part, Chapter 1, is an introduction that outlines the purpose and the format of the medical condition chapters. Chapter 2: 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 3 through 22 are the actual medical condition chapters.

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

- Appendix 1: BC Licence Classes, which describes the various classes of

driver's licences

- Appendix 2: Canada – US Reciprocity Agreement
- Appendix 3: 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,
- Appendix 4: Excerpts from the MVA that are relevant to the Driver Medical Fitness Program
- Appendix 5: Aging Drivers, which describes the research in support of routine screening of drivers who are 80 years of age and older
- Appendix 6: BC Specific Content Changes

1.1.2 Purpose of this Manual

This Manual documents the Driver Medical Fitness Program policy and procedures of RoadSafetyBC. It is to be used by RoadSafetyBC staff to supplement CCMTA's Guidelines when making driver fitness determinations.

1.1.3 A changing approach to driver fitness

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.

RoadSafetyBC has adopted a functional approach to driver fitness. This means that RoadSafetyBC assesses the impact of a medical condition on the functions necessary for driving when making driver fitness determinations.

Where a medical condition results in a persistent impairment of the functions necessary for driving, RoadSafetyBC 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 RoadSafetyBC bases its driver fitness determination on the results of medical assessments.

RoadSafetyBC 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.

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

Chapter 1.2: The authority for the CCMTA standards

1.2.1 Canadian Council of Motor Transport Administrators

The *Canadian Council of Motor Transport Administrators* is an organization comprising representatives of provincial, territorial and federal governments of Canada which, through the collective consultative process, makes decisions on administration and operational matters dealing with licensing, registration and control of motor vehicle transportation and highway safety. It also includes associate members from the private sector and other government departments whose expertise and opinions are sought in the development of strategies and programs.

CCMTA receives its mandate from, and reports to, the Council of Ministers Responsible for Transportation and Highway Safety.

The executive of CCMTA is made up of a fourteen-member Board of Directors, each representing his/her government who to attend to the overall management of the organization. The Board is responsible for providing overall guidance and specific direction to the standing committees. It reports to the Councils of Ministers and Deputy Ministers through the President of CCMTA, who is also Chair of the Board.

Reporting to the CCMTA Board, the work of CCMTA is conducted by three permanent standing committees. The mandates of the standing committees are as follows:

- The *Standing Committee on Drivers and Vehicles (D&V)* is responsible for all matters relating to motor vehicle registration and control, light vehicle standards and inspections, and driver licensing and control.
- The *Standing Committee on Compliance and Regulatory Affairs (CRA)* is concerned with the compliance activities of programs related to commercial driver and vehicle requirements, transportation of dangerous goods and motor carrier operations in order to achieve standardized regulations and compliance programs in all jurisdictions.
- The *Standing Committee on Road Safety Research and Policies (RSRP)* is responsible for coordinating federal, provincial and territorial road safety efforts, making recommendations in support of road safety programs, and developing overall expertise and strategies to prevent road collisions and reduce their consequences.

CCMTA's Vision is to have the safest and most efficient movement of people and goods by road in the world. Its mission is to provide a national forum for development of public policy and programs for road safety and driver and vehicle licensing.

1.2.2 The mandate of the CCMTA Driver Fitness Overview Group (DFOG)

The Driver Fitness Overview Group reports to the *CCMTA Standing Committee on Drivers and Vehicles*. Members are expected to be a mix of various types of expertise on driver fitness and consist of administrators and medical professionals representing licensing authorities. Medical professionals can include physicians, occupational therapists and nurses.

The mandate of the CCMTA DFOG is to derive a set of driver fitness policies and for jurisdictional use that incorporate the best ideas and principles included in the currently available literature and maintain their currency through periodic review. Specific responsibilities include:

- Develop strategies for all driver fitness issues using a driver fitness model which is a functional approach to determine the impact on the functions of driving.
- Recommend uniform medical standards to be used by administrators in assessing a person's medical fitness to operate a motor vehicle.
- Maintain and manage the CCMTA Medical Standards document.
- Act as liaison on behalf of CCMTA with other organizations (e.g.: Canadian Medical Association, U.S. Federal Highway Administration (FMCSA), medical specialty societies).
- Act as a clearing house for all activities under its purview.
- Identify areas of concern and direct activities accordingly.

1.2.3 The relationship between individual Canadian jurisdictions' driver fitness policies and the CCMTA standards

All Canadian provinces and territories have the authority to establish their own driver fitness policies and procedures. All have a medical review board or unit acting in an advisory capacity to the jurisdiction's licensing body (the Registrar) on medical matters that may affect a person's fitness to drive. However, in order to support a consistent approach to driver fitness across the country, the provinces and territories agreed to publish CCMTA Medical Standards for Drivers.

In 1985, medical standards for drivers were identified as part of the National Safety Code (NSC) initiative undertaken to achieve uniformity among the provinces and territories, on many aspects relating to the administration of drivers and vehicles. The rationale being that licence transfers upon a change of province of residence should not be complicated by divergent medical requirements. The classification of driver licences adopted by the provinces and territories as part of the NSC is shown in Appendix 1. A Medical Advisory Committee (MAC), comprised of physicians appointed by each jurisdiction, was created to identify and reconcile interprovincial medical standard variances and produce a harmonized standard. The basis for

developing the harmonized medical standards was primarily publications from the Canadian Medical Association (CMA) and other medical specialty associations.

In 2000, CCMTA created a Driver Fitness Project Group to carry out a standards review, with attention to risk, compensation, accommodation, functional focus and whether and how to assess for each medical standard. This approach reflected recent trends relating to evidence based medicine rather than standards in determining an individual's fitness to drive.

In 2008, a Driver Fitness Overview Group in 2008 was formed to:

- (i) Consolidate the work of the MAC and Driver Fitness to avoid duplicate work, duplicate reporting and record keeping and to house all medical related issues under the same umbrella, and
- (ii) Produce one central CCMTA medical document.

In 2011 the Driver Fitness Overview Group developed new driver fitness standards in conjunction with subject matter experts including researchers, general practitioners and medical specialists, and administrators from Canadian driver fitness authorities. The standards are intended as a guide in establishing basic medical qualifications to drive for both commercial and non-commercial drivers and are intended for use by both physicians and driver fitness authorities.

Although no jurisdiction in Canada is legally required to adopt the CCMTA standards, the majority are adopted by the driver fitness authorities. This achieves a uniformity of standards across Canada which supports both road safety and inter-provincial harmonization.

All medical standards, and subsequent changes, contained in Part 3 of this document are approved by all jurisdictions through a ballot process which requires a two thirds majority for approval.

1.2.4 The relationship between Canadian jurisdictions' driver fitness standards for commercial drivers, the CCMTA 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 (CMVs) effective March 30, 1999. The countries determined that the medical provisions of U.S. Federal Motor Carrier Safety Regulations (FMCSRs) and the Canadian National Safety Code (NSC) are equivalent (see Appendix 2).

There were three exceptions for Canadian drivers. Those who are (i) insulin-treated diabetics, (ii) hearing-impaired at a defined level, or (iii) have epilepsy

are not permitted to operate CMVs in the United States.

U.S. regulations prohibit individuals with those conditions from operating CMVs in the United States while they are allowed to drive commercial vehicles in Canada.

Also drivers from either country operating under a medical waiver or who are operating under medical *grandfather rights* are prohibited from operating in international commerce.

Because the reciprocal agreement between the United States and Canada identifies the CCMTA standards as the standard for commercial drivers, this means that regardless of individual provincial or territorial standards, **drivers of CMVs must meet or exceed the CCMTA standards if they drive in the United States.**

Commencing in January 2012, both countries agreed to adopt a unique identifier code to be displayed on the licence and the driving record to identify a commercial driver who is not qualified or disqualified from operating a commercial vehicle in the other country.

In Canada, the identifier code will be “W”, and defined as: “restricted commercial class – Canada only”. In the United States, the identifier code “V” will indicate the U.S. driver is only allowed to drive in the U.S. and is not medically qualified to drive in Canada.

Chapter 1.3: The BC Driver Medical Fitness Program

1.3.1 The legal and policy authority for the Driver Medical Fitness Program in British Columbia

The *Motor Vehicle Act* [OSMV 1996] Chapter 318

The *Motor Vehicle Act (MVA)* provides the statutory authority for the Driver Medical 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 4.

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 4.

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 4.

The relationship between the MVA and RoadSafetyBC driver fitness policy plays an important role in the work of a regulatory body. To understand this role, RoadSafetyBC decision-makers need to be familiar with the relationship between the MVA and RoadSafetyBC 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 Medical Fitness Program policy is not passed by the government but is developed and approved within RoadSafetyBC. Policy is generally binding on program operations and will generally be upheld by a judicial or quasi-judicial body.

Policy is how RoadSafetyBC 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 RoadSafetyBC to assess and determine driver fitness.

Policy can take many forms. In Chapters 2.1 through 2.5 of this Manual, Driver Medical Fitness Program policy is presented as individually numbered policy statements. In the medical condition chapters, the BC Driver Medical Fitness Program policy is presented as:

- CCMTA STANDARD medical condition guidelines,
- BC Guidelines for assessments and fitness determination;
- Conditions and Restrictions Guidelines; and
- RoadSafetyBC re-assessment interval guidelines.

When making driver fitness determinations, RoadSafetyBC decision-makers will generally refer to both the general policy statements from Chapters 2.1 through 2.5 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.

RoadSafetyBC 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 RoadSafetyBC staff responsible for driver fitness determinations.

1.3.2 Driver Medical Fitness Program overview

From 2010 to 2014, the Driver Medical Fitness Program assessed approximately 150,000 drivers annually. In an average year, about 5,000 drivers had their driving privileges cancelled for fitness reasons or for not complying with a request for assessment and about 1,000 drivers voluntarily surrendered their licence.

Approximately 600 drivers had their driving privileges class reduced.

The flowcharts following this section of text highlight the four key activities of the Driver Medical 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 2.2 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 2.3 of this Manual.

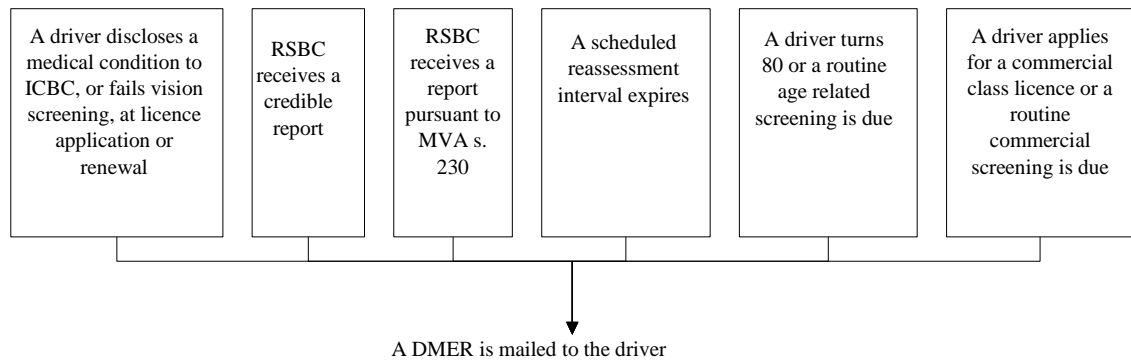
Determination involves reviewing:

- 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.

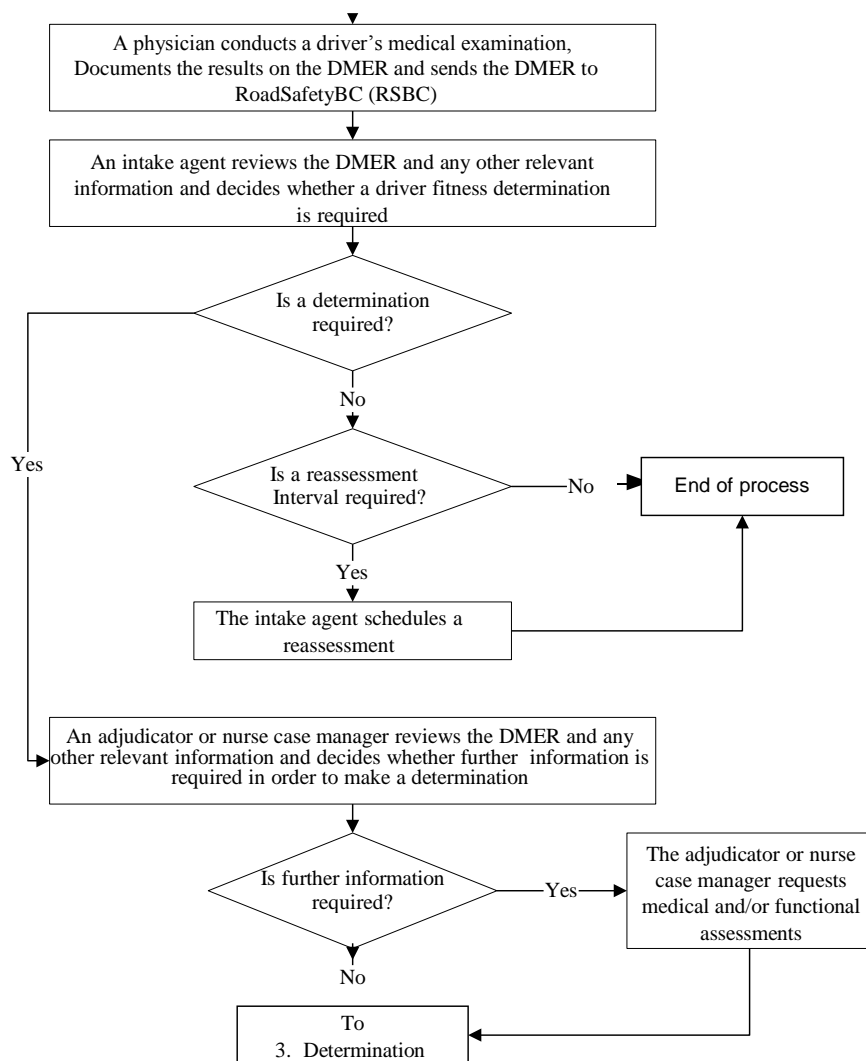
Policies and procedures that govern the determination process are outlined in Chapter 2.4 of this Manual.

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 2.5 of this Manual.

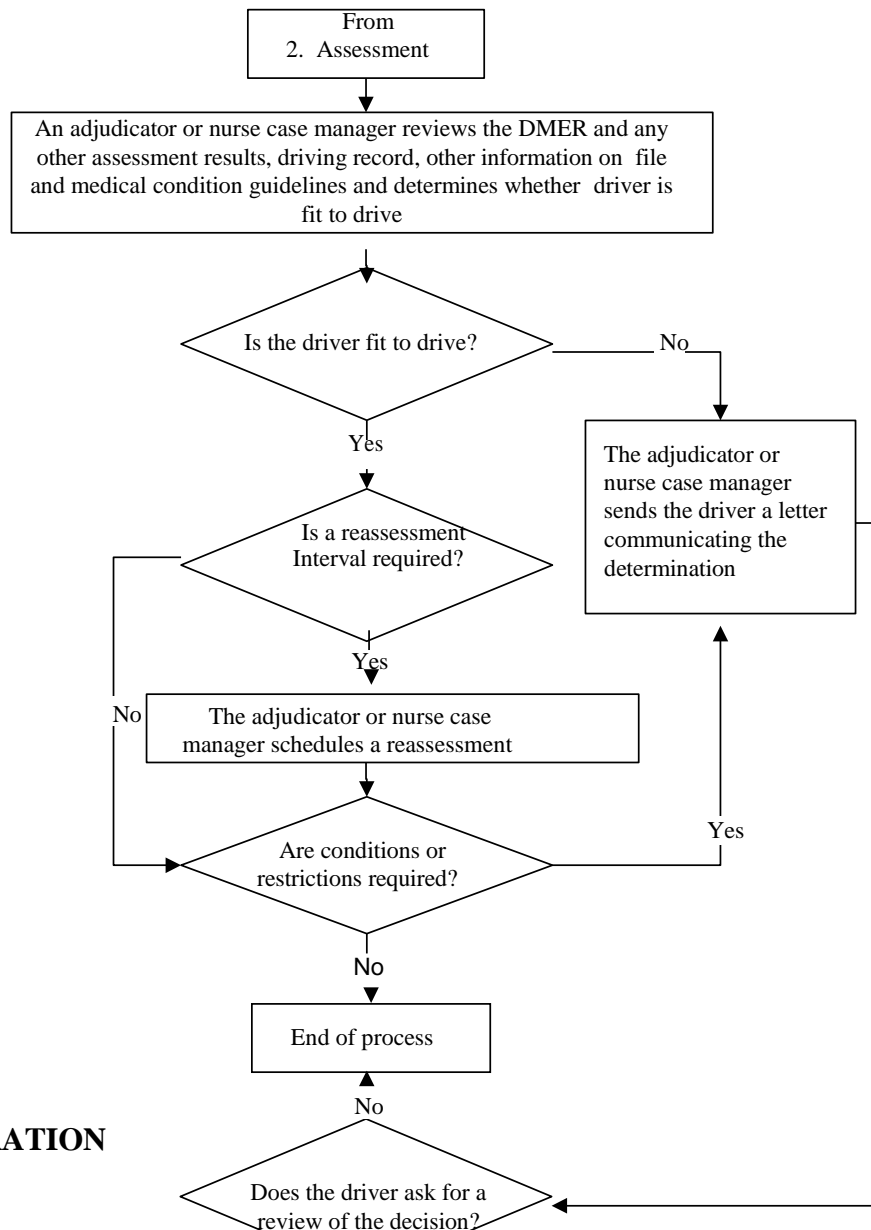
1. SCREENING



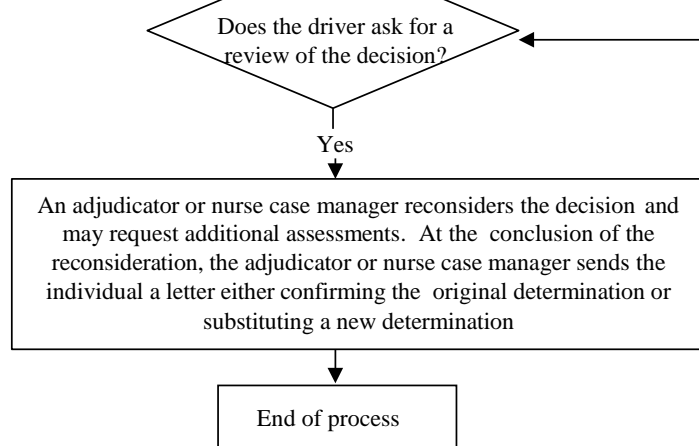
2. ASSESSMENT (subject to revision)



3. DETERMINATION



4. RECONSIDERATION



1.3.3 Roles and responsibilities

RoadSafetyBC works in partnership with ICBC and other agencies, such as the BC Driver Fitness Advisory Group, the Doctors of BC and the BC College of Physicians and Surgeons to implement and administer the Driver Medical Fitness Program. The following paragraphs highlight the roles and responsibilities of the key participants in the Driver Medical Fitness Program.

BC Driver Fitness Advisory Group

The Driver Fitness Advisory Group consists of RoadSafetyBC staff, and representatives from the Doctors of B.C., College of Physicians and Surgeons of B.C., B.C. Psychological Association, B.C. Nurse Practitioner Association, Canadian Association of Occupational Therapists and the College of Occupational Therapists of B.C. The advisory members serve as a valued source of input into the ongoing development of the CCMTA Standards and are consulted and engaged in discussion when new standards are being considered and ballots for change are circulated by the CCMTA. Advisory group members also offer ideas, provide advice and consult with RoadSafetyBC on the development of driver fitness strategic initiatives.

RoadSafetyBC

On a day-to-day basis, driver fitness determinations are made by RoadSafetyBC nurse case managers and adjudicators. The roles of various RoadSafetyBC staff within the Driver Medical Fitness Program are described in the paragraphs below.

Intake agents perform an initial review of DMERs and other assessment results that are sent to RoadSafetyBC. 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 nurse case manager.

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.

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

ICBC

In partnership with RoadSafetyBC and under delegation, ICBC performs some administrative functions for the Driver Medical 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 RoadSafetyBC 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 RoadSafetyBC 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 RoadSafetyBC 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, medical practitioners, or nurse practitioners must report to RoadSafetyBC 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, or nurse practitioner warns the patient of the danger.

The full text of section 230 is included in Appendix 4.

In addition to this reporting duty, medical practitioners or nurse practitioners conduct assessments and provide information to RoadSafetyBC on a patient's prognosis, treatment and extent of impairment. Sometimes medical practitioners or nurse 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 RoadSafetyBC to determine their fitness to drive.

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

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 3 provides an overview of the relationship between BC Driver Medical Fitness Program policy and policies applicable to commercial drivers who wish to drive in the United States.

Chapter 1.4: Driver Medical Fitness Program Principles

1.4.1 Overview

RoadSafetyBC has articulated the following four principles that guide the Driver Medical Fitness Program. By following these principles, RoadSafetyBC 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

While public safety is a prominent consideration when making driver fitness determinations, the requirements of administrative fairness must also be applied when making driver fitness determinations. Further, a degree of risk to public safety may be tolerated in order to allow a broad range of people to drive.

Functional approach

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

Individual assessment

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

Best information

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.

1.4.2 Risk management

While public safety is a prominent consideration when making driver fitness determinations, the requirements of administrative fairness must also be applied when making driver fitness determinations. Further, a degree of risk to public safety may be tolerated in order to allow a broad range of people to drive.

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]

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

How does RoadSafetyBC 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, RoadSafetyBC cannot precisely calculate the risk presented by a driver with a particular medical condition. However, RoadSafetyBC 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 RoadSafetyBC 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, RoadSafetyBC decision-makers are practicing risk management.

1.4.3 Functional approach

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

RoadSafetyBC takes a functional approach to determining driver fitness. This means that, when making driver fitness determinations, RoadSafetyBC assesses the effect(s) that a medical condition has on the 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
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 Medical 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 detects 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.

1.4.4 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 RoadSafetyBC's cancellation of a driver's licence. RoadSafetyBC 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 RoadSafetyBC 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 RoadSafetyBC 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*,

RoadSafetyBC 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, RoadSafetyBC 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.

1.4.5 Best information

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

For each individual, RoadSafetyBC 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. 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, RoadSafetyBC 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 2.1: Introduction to the Policies and Procedures

2.1.1 Overview

The flowcharts on the following two pages highlight the four key activities of the Driver Medical 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 2.2 of this Manual.

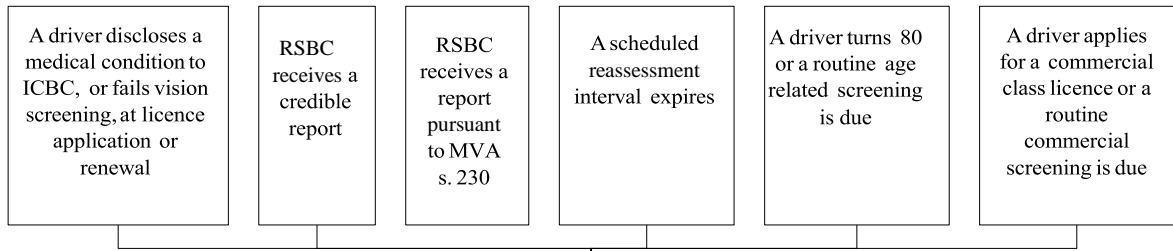
Assessment is the process of collecting information required to make a driver fitness determination. The key assessment used for driver fitness determinations is a driver's medical examination completed by an individual's general practitioner and documented on the Driver Medical Examination Report (DMER). A variety of other assessments may also be required, such as specialist examinations or road tests. Assessment policies and procedures are documented in Chapter 2.3 of this Manual.

Determination involves reviewing:

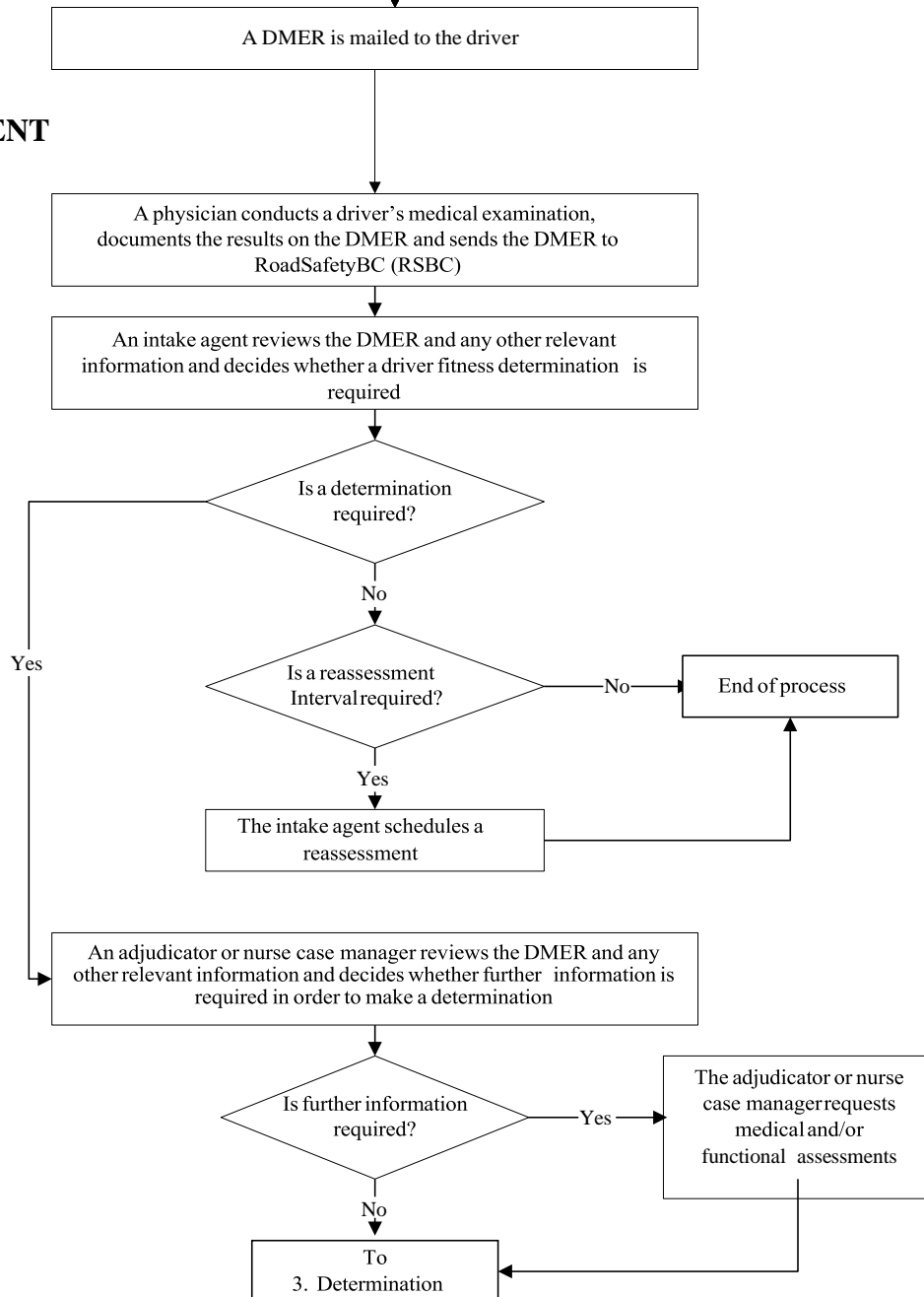
- The information obtained from assessments
- Any other relevant file information, such as driving history, and
- The medical condition guidelines outlined in Part 3 of this Manual and determining whether an individual is fit to drive. Policies and procedures that govern the determination process are outlined in Chapter 2.4 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 2.5 of this Manual.

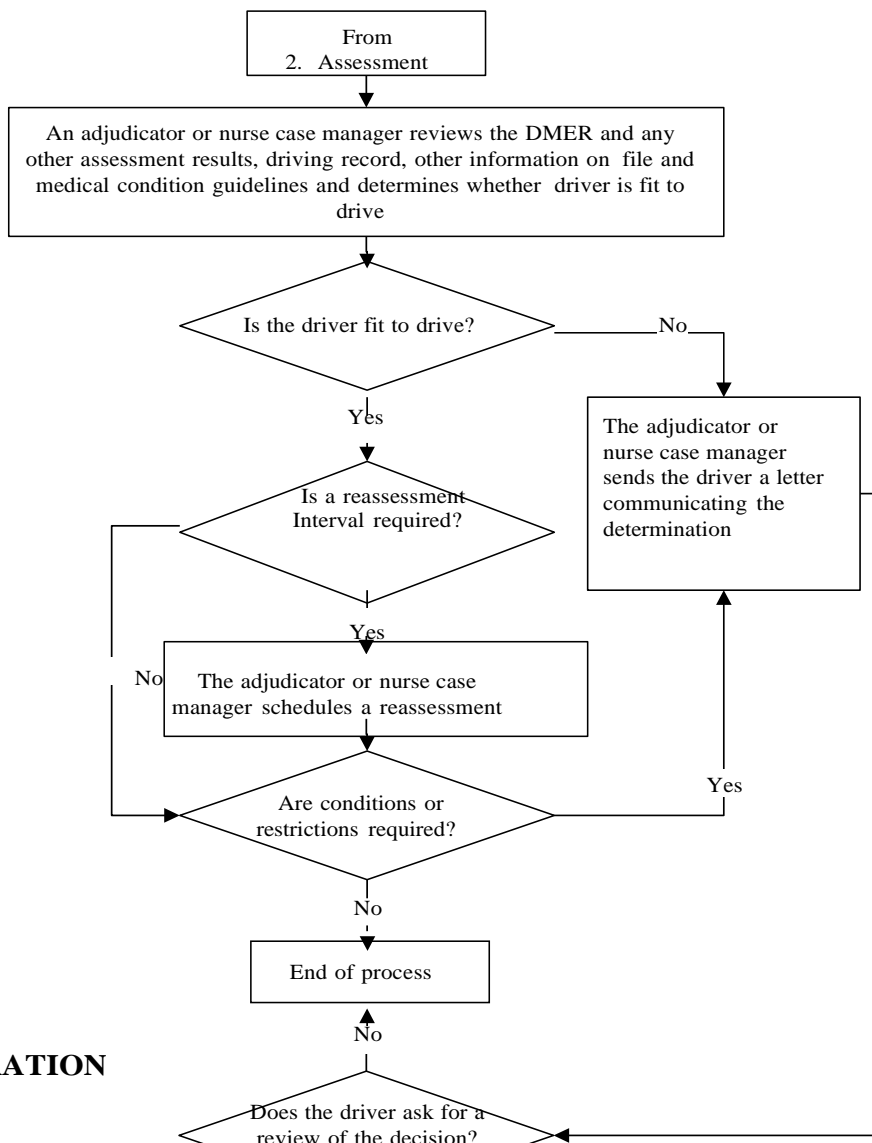
1. SCREENING



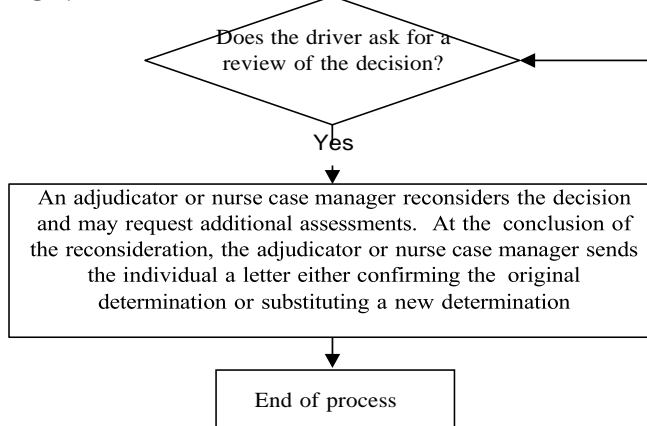
2. ASSESSMENT



3. DETERMINATION



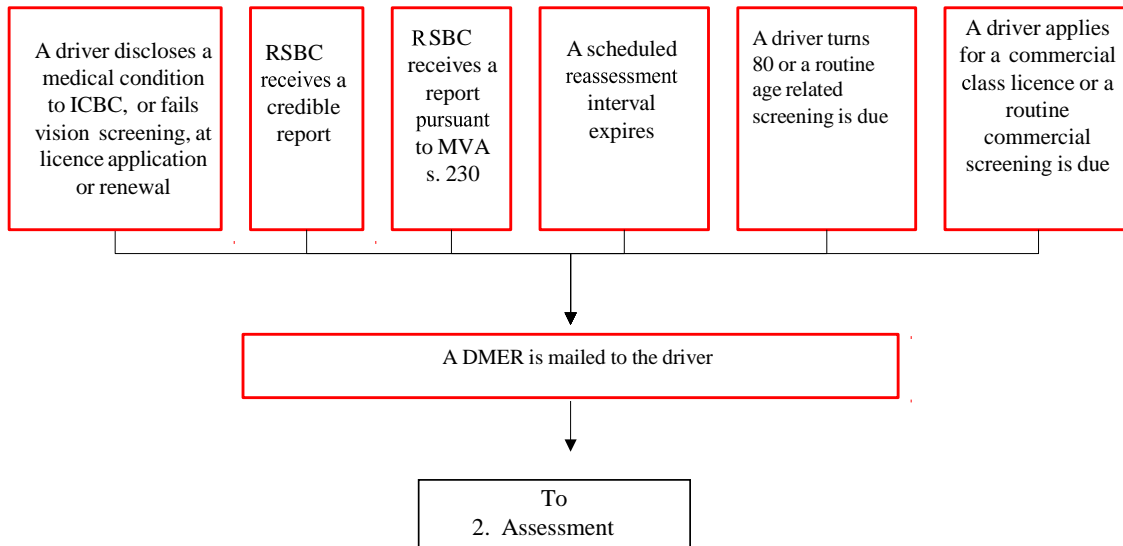
4. RECONSIDERATION



Chapter 2.2: Screening Policies

2.2.1 Overview

The following flowchart is an excerpt from the overview flowchart presented in 2.1 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 or nurse practitioner, optometrist or psychologist reports a driver to RoadSafetyBC pursuant to MVA s. 230
- Police, health care practitioners or other individuals submit a credible report to RoadSafetyBC
- 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 RoadSafetyBC staff upon receipt of a credible report or report pursuant to MVA s.230, or
- Automatically by RoadSafetyBC system in the case of commercial drivers, aging drivers and other drivers who have scheduled re-assessment intervals.

2.2.2 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 Medical 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

1. The Driver Medical Fitness Program screens individuals whose functional ability to drive may be impaired by a known or possible medical condition.
2. An individual with a known medical condition that may impair the functions necessary for driving will be screened when:
 - A physician or other health care professional reports to RoadSafetyBC that the individual has a medical condition that may impair the functions necessary for driving
 - 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
 - A RoadSafetyBC -scheduled re-assessment interval for an individual with a previously reported medical condition expires.
3. An individual with a possible medical condition that may impair the functions necessary for driving will be screened when RoadSafetyBC 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 RoadSafetyBC operates other programs that are concerned with fitness and ability to drive, such as its Driver Improvement Program, the Driver Medical 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 Medical 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.

2.2.3 Screening aging drivers

Definitions

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

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 5](#).

2.2.4 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

The Driver Medical 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 BC licence classes is included in [Appendix 1](#). 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.

2.2.5 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

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

Policy rationale

RoadSafetyBC 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.

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

Policy

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

Policy rationale

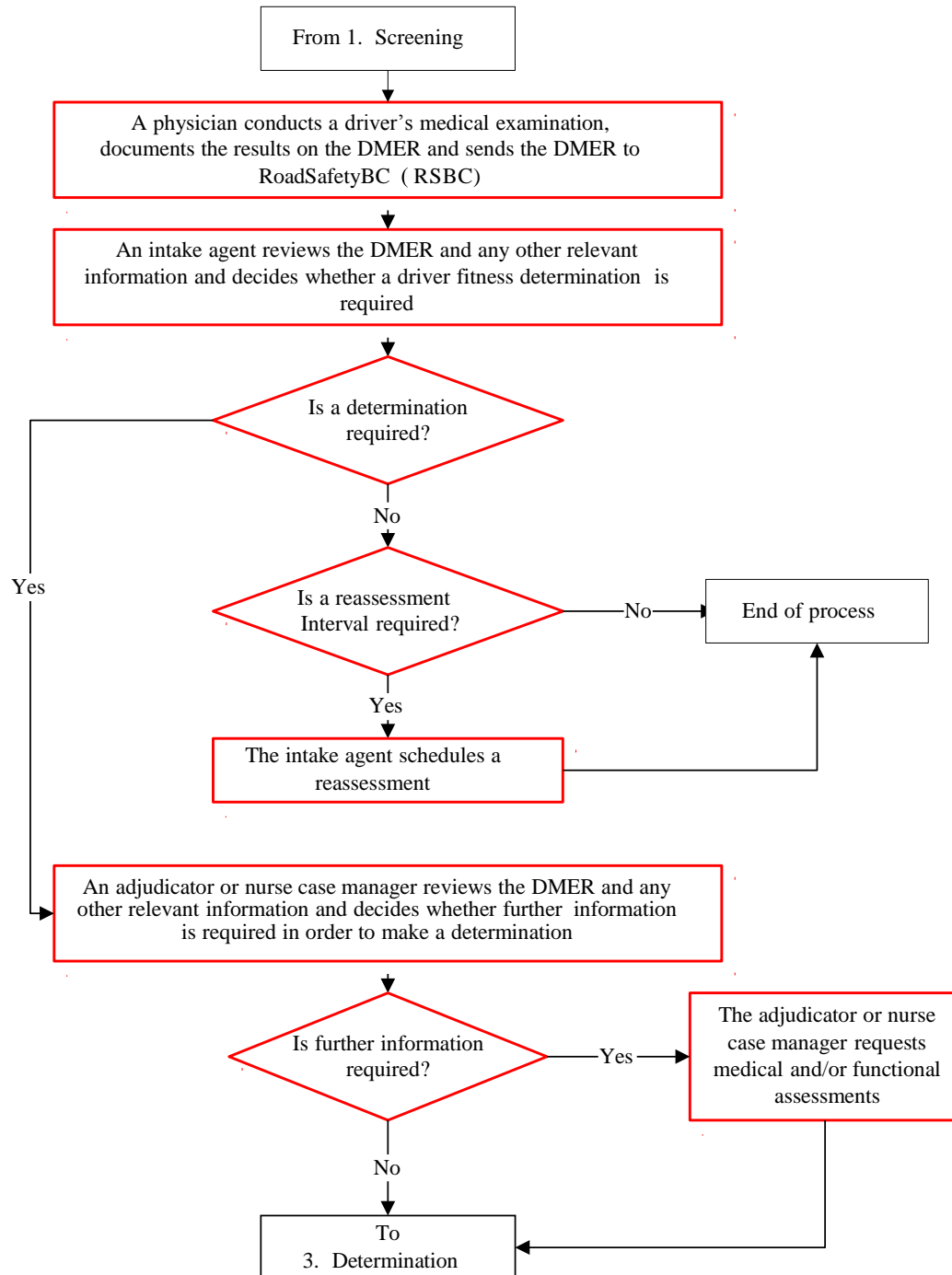
In most cases, RoadSafetyBC will not direct ICBC to restrict or cancel a licence based only on the information obtained during screening. However, there are times when cancellation or restriction may be warranted based on the results of screening. For example, a credible report may indicate that an individual's functional ability to drive is severely impaired. RoadSafetyBC would direct ICBC to cancel the driver's licence for public safety reasons and would review the decision once further information was received. The policies are discussed under 2.4.12 and 2.4.13.

In accordance with the principles of administrative fairness, RoadSafetyBC gives 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. The policy is discussed under 2.5.2.

Chapter 2.3: Assessment Policies and Procedures

2.3.1 Overview

The flowchart below is an excerpt from the overview flowchart presented in [2.2](#) that highlights in red the steps that take place during assessment.



During assessment, RoadSafetyBC 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 nurse 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 re-assessment 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 nurse 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 nurse 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 nurse case managers and adjudicators in determining the appropriate assessments to request for each individual. RoadSafetyBC policy on paying for assessments is contained in the Driver Fitness Assessment Payment Policy Manual. Assessments will only be requested if necessary to determine fitness.

2.3.2 Assessments will only be requested if necessary to determine fitness

Policy

A nurse 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 nurse case manager or adjudicator to determine whether or not a driver is fit, no further assessments will

be requested.

If, after reviewing the relevant medical condition guidelines, a nurse case manager or adjudicator decides that further information is required in order to make a determination, the nurse case manager or adjudicator will request further assessments.

If an individual clearly does not meet the medical condition guidelines for one or more of the individual's identified medical conditions, a nurse 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 RoadSafetyBC, RoadSafetyBC will only request an assessment if it is necessary to determine driver fitness.

2.3.3 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 RoadSafetyBC, but are often submitted by physicians and provide useful information regarding an individual's medical condition.

Policy

If a nurse 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 nurse case manager or adjudicator will request a medical assessment.

If a nurse case manager or adjudicator decides to request a medical assessment, the nurse 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 nurse 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 7)
Specialist assessments completed by a psychologist, addictions specialist or other medical doctor. (See 2.3.4 for policies on requesting specialist assessments)

Policy rationale

To ensure that RoadSafetyBC bases its driver fitness determinations on complete and accurate medical information, nurse 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.

2.3.4 Requesting specialist assessments

Policy

A nurse 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.

If the physician indicates that:

- The information can only be provided by a specialist
- There is no specialist assessment on the individual's file, and
- A specialist assessment is not medically necessary the nurse case manager or adjudicator will request a specialist assessment.

The nurse case manager or adjudicator will clearly articulate the scope of the required specialist assessment in the request.

The nurse 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 RoadSafetyBC 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 nurse case manager or adjudicator to make a determination of driver fitness.

Because RoadSafetyBC should not pay for specialist assessments that are medically necessary, a nurse 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.

2.3.5 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

If a nurse 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 nurse case manager or adjudicator will request a functional assessment.

If a nurse case manager or adjudicator decides to request a functional assessment, the nurse 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 nurse case manager or adjudicator may request that can observe or measure that function.

Driving function	Functional assessments
Cognitive (See <u>2.3.6</u> for policies on requesting assessments of cognitive function)	Screening Test such as MOCA, MMSE, SIMARD MD, Trails A or Trails B (cognitive screen)
	A cognitive road test If completion of a cognitive road test is logistically difficult, one or more of the following may be required; an occupational therapist or driver rehabilitation specialist assessment, a gerontologist assessment, an ICBC road test re-examination
Motor (including sensorimotor) (See <u>2.3.7</u> 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 <u>Chapter 9</u>)	Audiogram (hearing report)
Sensory: vision (See guidelines for requesting vision assessments in <u>Chapter 22</u>)	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

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

Multiple functional impairments

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

- Assessments of cognitive function
- Assessments of sensory function, and
- 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 nurse case manager or adjudicator will make a driver fitness determination without requesting further assessments of the other functions necessary for driving.

Multiple medical conditions

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 nurse 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 RoadSafetyBC's functional approach to driving fitness, a nurse 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, RoadSafetyBC 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 nurse 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 nurse 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, RoadSafetyBC 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.

2.3.6 Requesting assessments of cognitive function

Policy

A nurse case manager or adjudicator will request a cognitive road test of an individual when cognitive screening indicates further assessment is required.

In exceptional circumstances, e.g. if completing a cognitive road test assessment is logistically difficult, a nurse case manager or adjudicator may request one or more of the following; a driving assessment, an OT or driver rehabilitation

specialist assessment, or a gerontologist assessment, of an individual with a persistent cognitive impairment whose cognitive screening test results indicate further assessment is required.

Policy rationale

Historically, there has not been consistent practice amongst medical professionals pertaining to the choice of cognitive screening assessments. The assessment results that are most frequently submitted to RoadSafetyBC are the MOCA, the MMSE, Trails A and B, or the SIMARD MD. RoadSafetyBC will accept and consider the results of any or all of these assessments. The adjudicator will also consider any other available collateral information and determine if the entirety of the file information supports a finding of sufficient cognitive functioning to drive safely, or if additional information is required.

DriveABLE

When a cognitive road test is required, RoadSafetyBC may use a DriveABLE assessment to help determine if drivers with a suspected cognitive impairment are safe to continue driving.

DriveABLE assessments have two components. 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 a touch-screen computer. No computer familiarity is needed, as a mouse and keyboard are never used. Those in the most competent range are identified through automated scoring procedures and do not require further assessment. Drivers who score in the lower or indeterminate range proceed to an on-road evaluation for the second stage of the assessment. The on-road evaluation is different from regular road tests and is administered by a qualified DriveABLE evaluator. The on-road evaluation, which is done in a dual-brake vehicle for safety, utilizes a route which is specifically chosen to reveal errors made by drivers who have become unsafe due to declines in cognitive abilities.

2.3.7 Requesting assessments of motor function

Policy

A nurse case manager or adjudicator will request an OT or driver rehabilitation specialist assessment if further information is required on an individual's motor function.

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:

- 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
- 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
- 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.

2.3.8 Time period during which assessments are valid

Policy

Generally, a nurse 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 nurse case manager or adjudicator with the required information.

Policy rationale

Assessments may be costly and time-consuming for drivers, RoadSafetyBC and health care providers. If an assessment has already been conducted that provides a nurse case manager or adjudicator with the information required for a driver fitness determination, there is no need for an individual to be re-assessed, as 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.

2.3.9 Time limits for drivers to complete assessments

Policy

Whenever a nurse case manager or adjudicator requests an assessment, the nurse case manager or adjudicator will inform the individual of the time period within which the assessment must be completed.

A nurse case manager or adjudicator will allow an individual 30 days to comply with a request for an

- Examination of Visual Functions
- Visual Field Test
- Hearing Report, or
- Functional Driving assessment

A nurse 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.

A nurse case manager or adjudicator will allow an individual 60 days to comply with a request for an OT or driver rehabilitation specialist assessment.

Upon request, a nurse 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 nurse case manager or adjudicator will consider information from the individual regarding the circumstances that necessitate an extension, such as

- Work commitments
- The individual's location,
- The individual's degree of mobility, and/or
- Availability of assessors

If an individual does not comply with a request for an assessment within the time period or extension set by a nurse case manager or adjudicator:

- The nurse 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
- ICBC will not grant a licence, in the case of an individual who has applied for a licence

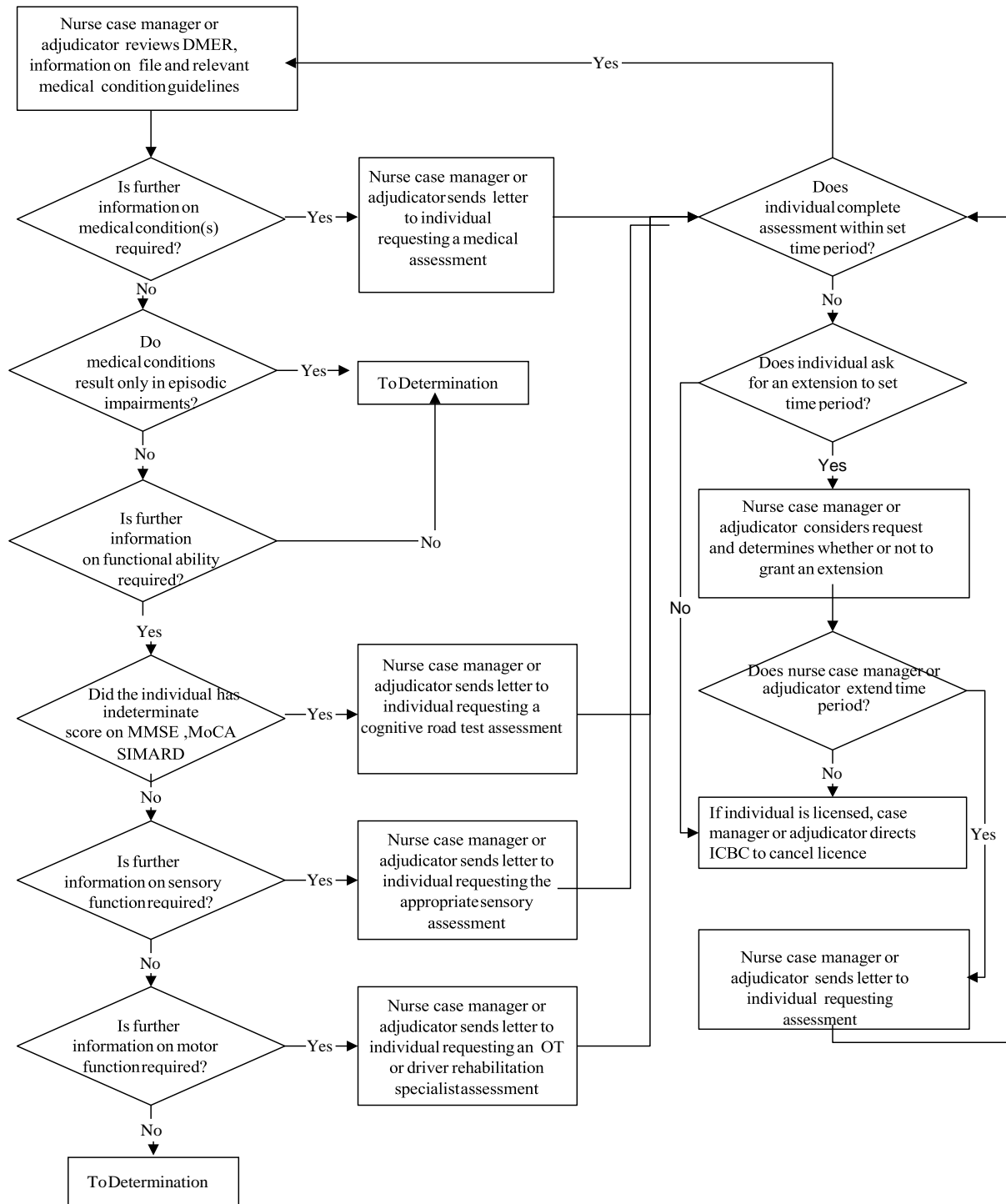
Policy rationale

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. RoadSafetyBC 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, RoadSafetyBC has the authority under section 92 of the MVA to direct ICBC to cancel a licence.

2.3.10 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 nurse case managers and adjudicators.

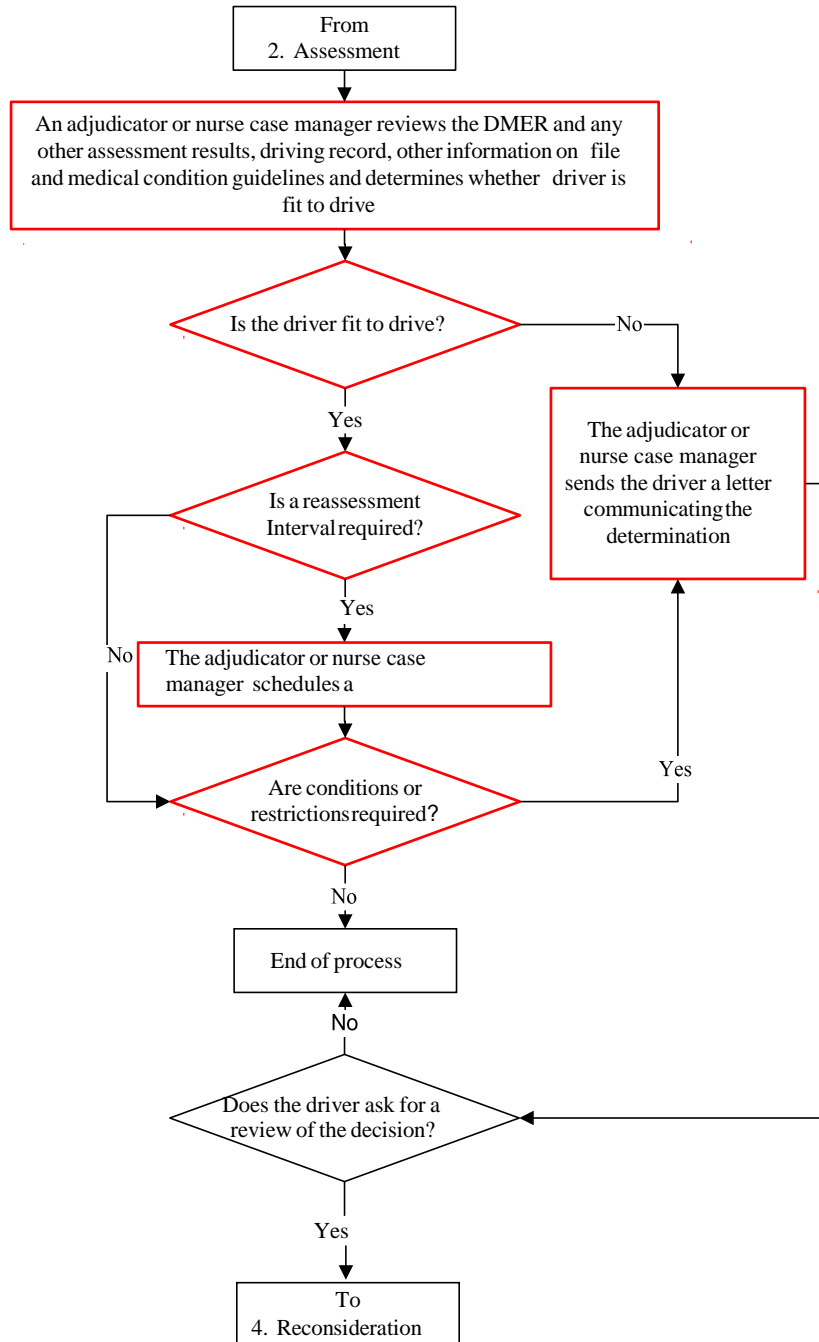
ASSESSMENT PROCEDURES



Chapter 2.4: Determination Policies and Procedures

2.4.1 Overview

The following flowchart is an excerpt from the overview flowchart presented in 2.1 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 nurse case managers. To make a driver fitness determination, a nurse 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 nurse case manager or adjudicator will also decide whether re-assessment 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 nurse case managers and adjudicators in considering these factors and making driver fitness determinations.

2.4.2 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

As part of each driver fitness determination, a nurse case manager or adjudicator will determine:

- Whether an individual is fit to drive the types of motor vehicles allowed under the class of licence held or applied for
- 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 [2.4.9](#) for policies on imposing restrictions and conditions), and if the individual is fit to drive, whether re-assessment at a future date will be required (see [2.4.11](#) for policies on determining whether re-assessment is required and setting re-assessment 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 nurse 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 re-assessment is required for all individuals who are fit to drive.

2.4.3 Making driver fitness determinations for persistent and episodic impairments

A nurse case manager or adjudicator will make a driver fitness determination for an individual with a persistent impairment based on evidence of functional impairment.

A nurse 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, nurse 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 nurse 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.

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

Policy

If collateral information and cognitive screening indicate that the individual's cognitive function is sufficient to safely drive, a cognitive road test assessment will not be required.

If an individual passes a cognitive road test the individual's cognitive function is sufficient to drive safely.

If an individual fails a cognitive road test, the individual's cognitive function is not sufficient to drive safely and the individual is not fit to drive.

RoadSafetyBC uses DriveABLE as the primary cognitive road test assessment as discussed in Chapter [2.3.6](#)

Policy rationale

Cognitive screening tests and cognitive road test assessments are used 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.

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

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 nurse case manager or adjudicator will review and consider:

- information obtained through medical assessments
- information obtained through any functional assessments
- the individual's driving record (see [2.4.6](#) for policies on considering driving records)
- specific driving or safety requirements associated with the types of motor vehicles that the individual wishes to drive (see for policies on considering specific driving or safety requirements), and
- the medical condition guidelines for the identified medical conditions.

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:

- the medical condition guidelines for the class of licence held or applied for indicate that they are fit to drive
- 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
- 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 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 2.4.10 for policies on assessing future compliance with restrictions or conditions).

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:

- the medical condition guidelines for the class of licence held or applied for indicate that they are not fit to drive
- 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
- 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
- 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 2.4.10 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 nurse 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.

Nurse 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, nurse 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.

2.4.6 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

During every driver fitness determination, the nurse 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.

In particular, the nurse case manager or adjudicator will review:

- 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
- 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.

2.4.7 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 nurse 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 nurse 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.

2.4.8 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

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

An individual cannot compensate for an episodic impairment.

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.

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 Medical Fitness Program, RoadSafetyBC 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.

2.4.9 Imposing restrictions and/or conditions

Definitions

Condition

means a condition that is imposed on an individual by RoadSafetyBC. 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

Where applicable, a nurse 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

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

- only operate vehicles during daylight hours
- only operate certain types of vehicles
- only operate vehicles in certain geographic areas
- only operate vehicles under a certain speed
- only carry certain types of cargo
- wear specific devices, and/or
- use specific vehicle modifications or adaptations

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

The following table lists the restrictions used by the Driver Medical 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

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

Conditions

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

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

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

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

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, nurse 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 Medical Fitness Program policy. Also, in the case of restrictions, they must be enforced easily at roadside.

2.4.10 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 RoadSafetyBC.

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

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

- 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
- medical assessments on file for information that indicates that the individual is non-compliant with their prescribed treatment regime or medications
- the individual’s driving record for any information that indicates the individual has been non-compliant with restrictions or conditions in the past, and
- any credible reports for information that indicates that the individual

has been non-compliant with restrictions or conditions in the past.

Without information to the contrary, a nurse 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 nurse 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 nurse 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.

2.4.11 Determining re-assessment intervals

Definitions

Re-assessment

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

Policy

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

Generally, re-assessment will be required if:

- the individual has a medical condition that is progressive
- 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
- 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
- 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
- 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
- it is recommended by a physician, and/or
- the re-assessment interval guidelines for the medical condition indicate that re-assessment is required.

To determine whether re-assessment is required and, if so, the appropriate interval, the nurse case manager or adjudicator will consider:

- the re-assessment interval guidelines outlined in the relevant medical condition chapter(s)
- the date of onset, diagnosis and/or treatment of the medical condition, if known
- the severity of the medical condition
- whether the condition is stable and, if so, the period of stability
- whether the condition is progressive and, if so, the rate of progression
- whether the condition is controlled
- if the individual is a commercial or aging driver, the date of the next scheduled routine screening
- whether the individual has been compliant with any prescribed treatment regime, conditions or restrictions
- the results of any functional assessments
- the individual's driving record, and/or
- the recommendation of a physician.

A nurse case manager or adjudicator will not schedule a re-assessment interval for a private driver aged 80 or over, or a commercial driver, if the individual's next scheduled routine screening will provide RoadSafetyBC with the necessary

opportunity for re-assessment.

A nurse case manager or adjudicator can set any re-assessment interval that is appropriate for a particular individual. Generally, a nurse case manager or adjudicator will set a re-assessment interval at either:

- 1 year
- 2 years
- 3 years, or
- 5 years.

Generally, a nurse case manager or adjudicator will set a re-assessment interval at 1 year if:

- an individual's cognitive function is impaired and the level of cognitive impairment is likely to increase over time
- 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
- 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
- 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 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.

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

Policy rationale

RoadSafetyBC schedules re-assessments 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 re-assessment requirement, these individuals may not again be brought to the attention of RoadSafetyBC until their functional ability to drive has deteriorated to the point that they pose a high degree of risk to public safety. Re-assessment intervals may be scheduled for both private and commercial drivers but, to ensure that individuals are not re-assessed

unnecessarily, RoadSafetyBC will not schedule a re-assessment interval for a private driver aged 80 or over, or a commercial driver, if the next scheduled routine screening will provide RoadSafetyBC with sufficient opportunity for re-assessment.

To ensure that individuals are not re-assessed unnecessarily, RoadSafetyBC policy sets out the circumstances when re-assessment may be required. For individuals with persistent impairments, re-assessment 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, re-assessment 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 re-assessment 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 nurse 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.

Re-assessment 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.

2.4.12 Urgent Driver's Licence Reviews

Background

On November 19, 2013, the Honourable Madam Justice Fenlon rendered her judicial review decision on *Wong v. British Columbia (Superintendent of Motor Vehicles)*. This involved a case in which the Superintendent of Motor Vehicles medically cancelled a driver's licence, and subsequently upheld the cancellation upon reconsideration.

Impact on Driver Medical Fitness Program

The Wong judicial review decision resulted in the Driver Medical Fitness Program making changes to its driver's licence cancellation process.

Policy

When RoadSafetyBC receives reliable evidence of a serious medical issue that may affect a driver's ability to drive safely, RoadSafetyBC undertakes an urgent file review and a driver may receive one of the following letters:

- Urgent Cancellation Decision
- Notice to Cancel
- Request for Urgent Assessment
- Request for Further Information

Evidence of a serious medical issue may be in the form of a report received from police, a physician or from another health care professional. The information received must not be a result of an on-going correspondence with a driver or from a request for further medical information.

Policy rationale

Urgent Cancellation of a driver's licence means that a driver's licence is cancelled immediately without prior notice to the driver. However, reconsideration rights are given to the driver. The driver is given 21 days to request reconsideration of RoadSafetyBC's decision to urgently cancel the driver's licence.

In order for a driver's licence to be urgently cancelled, there must be:

- Reasonably reliable evidence of a medical issue; and
- Reasonably reliable evidence of a road safety risk.

The evidence must justify immediate cancellation. Based on the Wong decision, the following criteria must be met before a driver's licence is cancelled:

- The date of the event/episode must generally not be over a month old;
- The threshold of public safety is high thereby raising immediate road safety concerns; and

- There is evidence of medical urgency.

The *Motor Vehicle Act* requires the Superintendent of Motor Vehicles to ensure that British Columbia drivers are medically, physically and cognitively fit to drive. When making decisions about a driver's fitness and ability, the Superintendent may consider medical reports, police reports, driving tests/assessments, and opinions of medical practitioners. While each of these is considered, the *Act* places the ultimate responsibility for determining a person's fitness to drive on the Superintendent.

The test to be met for Driver Fitness decisions is reasonableness. A reasonable decision is one which falls within a range of possible, acceptable outcomes which are defensible in respect of the facts and law.

2.4.13 Communicating a decision

Policy

Informing drivers of determinations

A nurse 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 nurse case manager or adjudicator decides that:

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

Informing ICBC of determinations

A nurse 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.

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

A nurse 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.

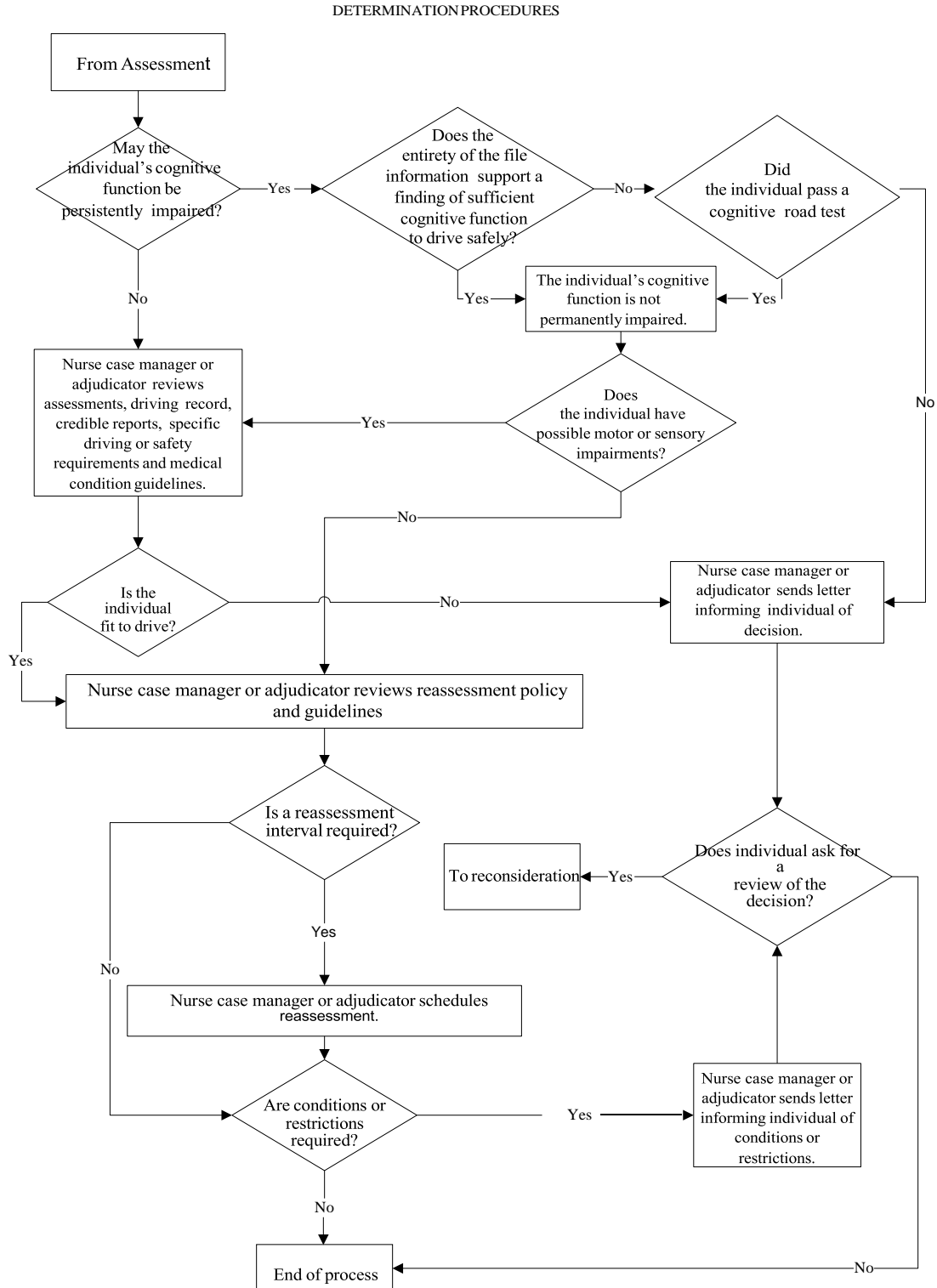
Policy rationale

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 RoadSafetyBC 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 nurse case manager or adjudicator may direct ICBC to issue a class 5 licence after cancelling an individual's commercial licence.

2.4.14. Determination procedures

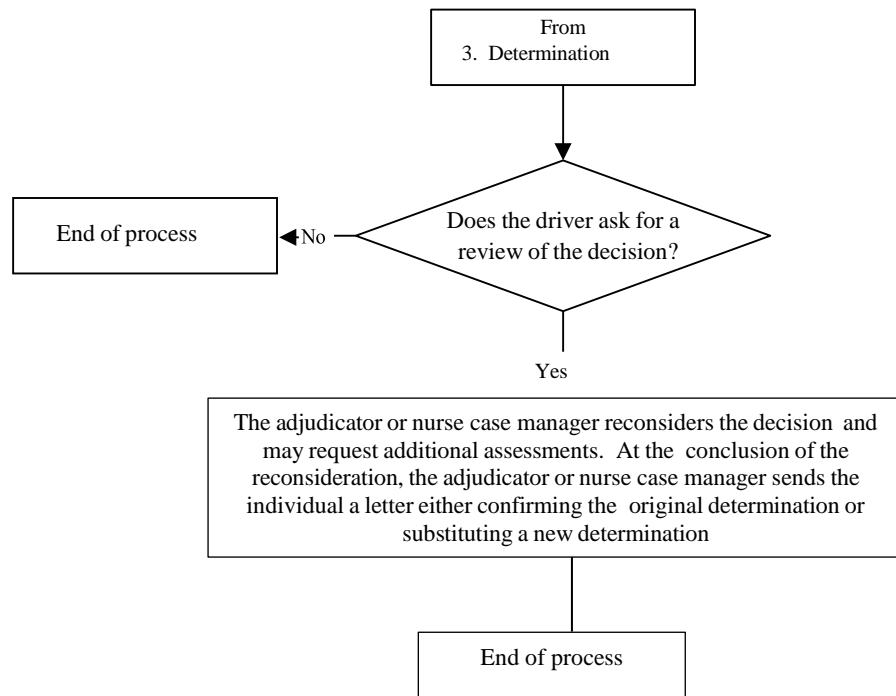
The following flowchart graphically illustrates the procedures associated with the determination process.



Chapter 2.5: Reconsideration Policies and Procedures

2.5.1 Overview

If an individual asks RoadSafetyBC to review a driver fitness determination, an adjudicator or nurse case manager will conduct a reconsideration of that decision. The following flowchart is an excerpt from the overview flowchart in [2.1](#) that highlights in red the steps involved in reconsideration.



During the reconsideration, the adjudicator or nurse case manager may request additional assessments, in accordance with the policies outlined in Chapter 2.3 of this Manual.

Once the adjudicator or nurse case manager collects any additional information that may be required, the adjudicator or nurse case manager applies the policies outlined in Chapter 2.4 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.

2.5.2 Conducting reconsiderations

Policy

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

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 nurse case manager or adjudicator will generally make a new driver fitness determination, based on new assessments, rather than reconsidering the previous determination.

If an individual submits new information indicating a change in their medical condition, or in their functional ability to drive, a nurse case manager or adjudicator will make a new driver fitness determination, based on new assessments, rather than reconsidering the previous determination.

At the conclusion of a reconsideration, the adjudicator or nurse case manager will either confirm the original driver fitness determination or substitute a new determination.

The adjudicator or nurse case manager will provide the individual with a letter that describes the reconsideration decision and the reasons for the decision.

Policy rationale

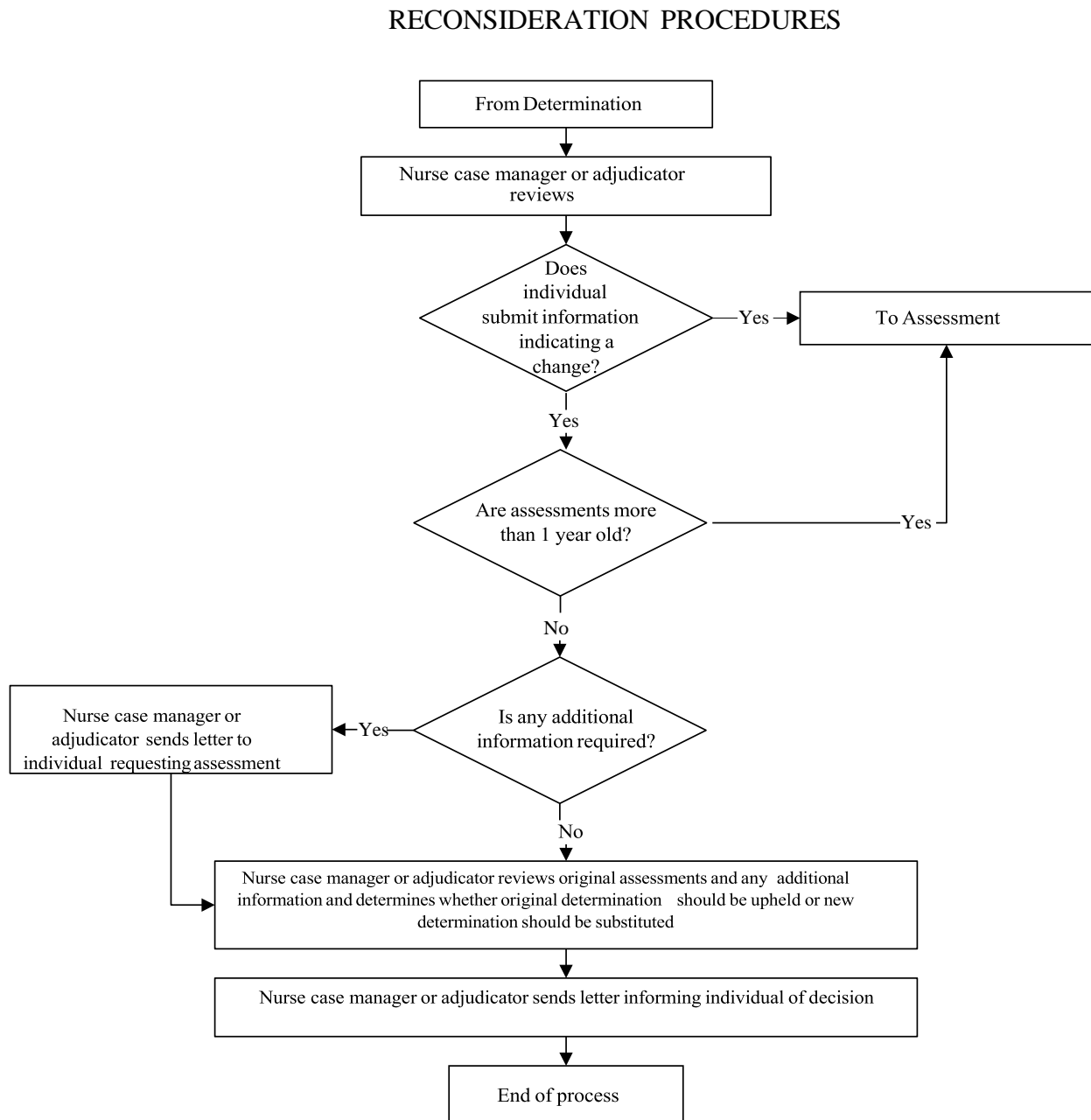
In accordance with the principles of administrative fairness, RoadSafetyBC gives individuals an opportunity to dispute the results of a driver fitness determination through its internal reconsideration process and provides written reasons with the results of the reconsideration.

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 nurse case manager or adjudicator will make a new driver fitness determination, based on this new information and any additional assessments that the nurse 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 nurse 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.

2.5.3 Reconsideration procedures

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



**PART 3:
CCMTA MEDICAL
STANDARDS FOR DRIVERS
WITH BC SPECIFIC
GUIDELINES**

Summary of Chapters and Medical Conditions

Chapter Number	Chapter Title	Conditions/Contents
1	Introduction	
2	Medical conditions at-a-glance	
3	Cardiovascular disease and disorders	Cardiovascular diseases
4	Cerebrovascular disease	Cerebrovascular diseases
5	Chronic renal disease	Renal diseases
6	Cognitive impairment including dementia	Cognitive impairment
7	Diabetes - Hypoglycemia	Diabetes, Hypoglycemia
8	General debility and lack of stamina	Chronic fatigue syndrome, malabsorption syndromes, AIDS, malignancies, chronic pain
9	Hearing loss	
10	Intracranial tumours	Intracranial tumours
11	Musculoskeletal conditions	Musculoskeletal
12	Neurological disorders	MS, Cerebral Palsy, Parkinson's
13	Peripheral vascular diseases	Abdominal Aortic Aneurysm Aortic dissection DVT – Pulmonary embolism Peripheral arterial disease
14	Psychiatric disorders	Mood disorders, ADHD, Schizophrenia, Personality disorders
15	Psychotropic Drugs and Driving	Opioids, Antidepressants, Antiepileptics, Antihistamines, Antipsychotics, Sedatives, Stimulants, Alcohol dependence
16	Respiratory diseases	Chronic obstructive pulmonary disease
17	Seizures and epilepsy	Seizures, epilepsy, alcohol induced seizures
18	Sleep disorders	Narcolepsy Sleep Apnea (OSA)
19	Syncope	
20	Traumatic brain injury	Traumatic brain injuries
21	Vestibular disorders	Vertigo, dizziness
22	Vision impairment	Vision impairment
23	Medical Review for Drivers	Frequency of medical review

Chapter 1: Introduction

1.1 Purpose of this part

The medical conditions chapters in this part of the document:

- identify what medical 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 compensation strategies, devices and/or training that may be used to compensate for the effects of a medical condition on driving, and
- include driver fitness standards to assist authorities in determining whether an individual with a medical condition should be licensed and, if so, the appropriate reassessment interval.

1.2 Source of the medical condition chapters

The medical standards in this part were taken from the CCMTA Medical Standards for Drivers Version: Edition 13 - August 20 2013.

Although no jurisdiction in Canada is legally required to adopt the CCMTA standards, the majority are adopted by the driver fitness authorities. This achieves a uniformity of standards across Canada which supports both road safety and inter-provincial harmonization.

To support a consistent approach to driver fitness across the country, British Columbia has adopted the CCMTA Medical Standards for Drivers.

All medical standards, and subsequent changes, contained in Part 3 of this document are approved by all jurisdictions through a ballot process which requires a two thirds majority for approval

1.3 Medical Condition chapter template

Below is the template used for the medical condition standards chapters. It is annotated to explain what type of information is found in each section of the template.

NAME OF MEDICAL CONDITION

About medical condition

Information about the medical condition to assist driver fitness authorities in understanding and applying the guidelines for assessment.

Prevalence

Information about the prevalence of the medical condition, which is relevant to the frequency that it may appear as an issue for licensing.

Medical condition and adverse driving outcomes

Conclusions on the general findings of research on the link between the medical condition and adverse driving outcomes.

Effect on functional ability to drive

Information on the specific effects of the medical condition on the functional abilities needed for driving. This section includes the following table:

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
The medical condition and any distinct presentations or variations of the condition	Whether the functional impairment is persistent or episodic, and whether a medical assessment and/or functional assessment is required	The primary functional abilities affected by the medical condition: cognitive, motor, or sensory	The assessment tool to be used, e.g. cognitive road test.

Compensation

Information about whether or not a driver can compensate through the use of strategies or devices for the functional impairment caused by a medical condition. Treatment for a condition, e.g. medication, is not a type of compensation.

Guidelines for assessment

This section names the medical condition and any distinct presentations or variations that require an individual standard. A standard may be for **all** licence classes (non- commercial classes 5-7 and commercial classes 1-4), for non-commercial drivers only, or for commercial drivers only.

Additional background information about the medical condition may be included here to help provide context for the standard and other information in the table, below.

Standard	The requirements that must be met in order to be licensed
BC Guidelines	<ul style="list-style-type: none"> • The assessment tools RoadSafetyBC may use if further information is required, to make a licensing decision. • Where applicable, specific requirements that must be met in order to be licensed in BC are outlined
Conditions for maintaining licence	Description of any conditions RoadSafetyBC may require for maintaining a licence in BC
Restrictions	Description of any appropriate restrictions RoadSafetyBC may impose on an individual's licence.
Reassessment	<ul style="list-style-type: none"> • Description of a suggested period on how often an individual will be reassessed after being found eligible for a licence • Where applicable, RoadSafetyBC will determine appropriate re-assessment interval on an individual basis • Where a reassessment period is mandatory it is also reflected in the standard • Where there is no particular reassessment period for the medical condition, then reassessment is "routine"
Information from health care providers	<ul style="list-style-type: none"> • Description of any information about the medical condition or functional ability that an authority usually requests when applying the standard. This information will come from medical and functional assessments and is supplied by from physicians, driver rehabilitation specialists or other health care providers. • Specific information that may be requested includes a professional's opinion regarding: <ul style="list-style-type: none"> • whether the individual has insight into the impact their medical condition may have on driving • whether the individual is compliant with their current treatment regime • if known or applicable, whether the individual is compliant with any current conditions for maintaining a licence
Rationale	A brief description of the rationale for the guide

Chapter 2: 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
- the chapter where the specific information is available

Condition	Chapter Reference	Type of Impairment	
		Persistent	Episodic
Abdominal Aortic Aneurysm	13		X
Aortic dissection	13		X
Cardiovascular diseases	3	X	X
Cerebrovascular diseases	4	X	X
Cognitive impairment including dementia	6	X	
Diabetes – Hypoglycemia	7		X
DVT – Pulmonary embolism	13		X
Hearing loss	9	X	
Intracranial tumours	10	X	X
MS, Cerebral Palsy, Parkinson's	12	X	X
Musculoskeletal	11	X	
Narcolepsy	18	X	X
Peripheral arterial disease-severe claudication	13	X	
Psychiatric disorders	14	X	X
Renal diseases	5	X	
Psychotropic; Drugs and Driving	15	X	X
Respiratory diseases	16	X	
Seizures and epilepsy	17		X
Sleep apnea	18	X	X
Syncope	19		X
Traumatic brain injuries	20	X	X
Vestibular disorders	21	X	X
Vision impairment	22	X	

Chapter 3: Cardiovascular disease and disorder

3.1 About cardiovascular disease

Overview

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 buildup 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.

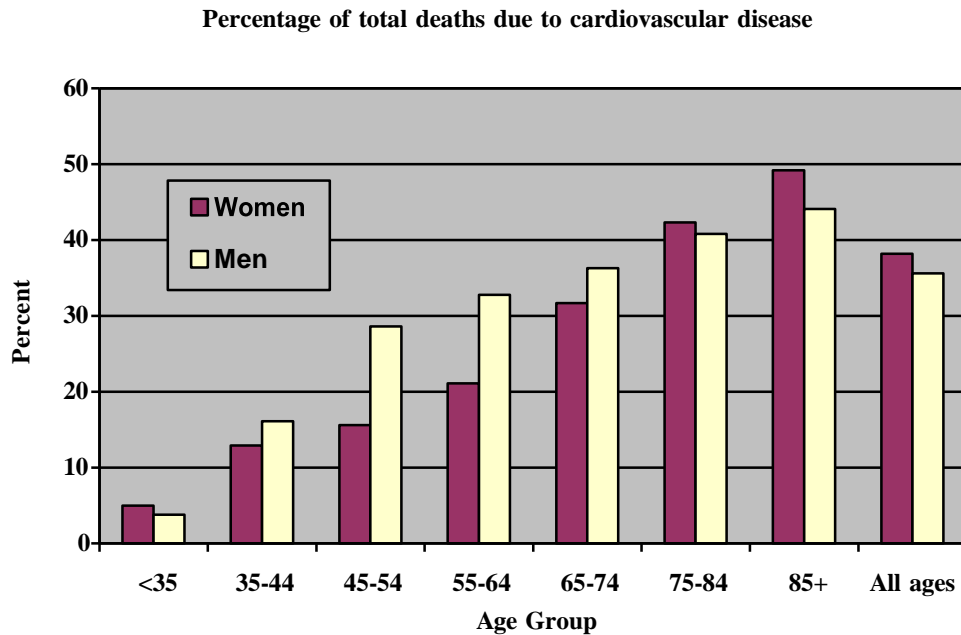
Category	Description
I	No symptoms and no limitation in ordinary physical activity. Comfortable at rest.
II	Mild symptoms and slight limitation during ordinary activity. Comfortable at rest.
III	Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at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

3.2 Prevalence

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.



3.3 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.

3.4 Effect of cardiovascular disease on functional ability to drive

Condition	Type of driving impairment and assessment approach ⁴	Primary functional ability affected	Assessment tools
Coronary artery disease Arrhythmias Valvular heart disease Cardiomyopathy	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation	Medical assessments
Congestive heart failure	Persistent Impairment: Functional assessment	Can affect Motor Sensory and Cognitive function May also result in general debility or lack of stamina	Medical assessments Functional Assessment
	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation	Medical assessments Specialist's report
Post cardiac arrest Post-operative cognitive decline (POCD)	Persistent Impairment: Functional assessment	Can affect Motor Sensory and Cognitive function May also result in general debility	Medical assessments Functional Assessment

⁴ See Part 1 for a discussion of the use of functional assessments for driver licensing decisions.

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 also may 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.

3.5 Compensation

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

3.6 Guidelines for assessment

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 impairment associated with cardiovascular diseases.

Where the standards differ from the CCS recommendations, the rationale is included in the table.

For CCS recommendations for transient conditions (waiting periods) see Section [3.6.50](#) which form part of the standards.

3.6.1 Congenital heart defects

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • they meet any standards related to a specific cardiovascular condition or event
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • If the defect has been repaired and the treating physician does not indicate any concerns, no re-assessment, other than routine commercial or age-related re-assessment, is required. • If the defect has not been repaired, RoadSafetyBC will re-assess every 5 years, unless routine commercial or age-related re-assessment applies
Information from health care providers	<ul style="list-style-type: none"> • Whether or not the defect has been repaired • Presence of any specific cardiovascular condition or event or risk of condition or event that may impair functional ability to drive
Rationale	<p>Congenital heart defects are not specifically addressed in the CCS recommendations. This standard is included here to assist where a congenital heart defect is reported to an authority. The nature of congenital heart defects and their treatment is variable; therefore there are no driver fitness standards specifically for them.</p>

3.6.2 Acute Coronary Syndromes – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence 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 • the waiting periods have been met (Section <u>3.6.50</u>)
BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may 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. • RoadSafetyBC will not generally seek angiogram studies unless there is concern from treating physician. • RoadSafetyBC may find individuals fit to drive if <ul style="list-style-type: none"> ○ the applicable waiting periods are met (see <u>3.6. 50</u>); OR ○ the above standard is met
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, or as recommended by the treating physician, unless routine age-related re-assessment applies.
Information from health care providers	<ul style="list-style-type: none"> • Extent of reduction in the left main coronary artery • Where applicable, result of treatment with revascularization • RoadSafetyBC will not generally seek above information or angiogram studies unless there is concern from treating physician
Rationale	CCS recommendation

3.6.3 Acute Coronary Syndromes – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence 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 • providing the applicable waiting periods are met (<u>3.6.50</u>)
BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may 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 • RoadSafetyBC will not generally seek angiogram studies unless there is concern from treating physician • RoadSafetyBC may find individuals fit to drive if <ul style="list-style-type: none"> ○ the applicable waiting periods are met (see <u>3.6.50</u>); OR ○ the above standard is met
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment, or as recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Extent of reduction in the left main coronary artery • Where applicable, result of treatment with revascularization • RoadSafetyBC will not generally seek above information or angiogram studies unless there is concern from treating physician
Rationale	CCS recommendation

3.6.4 Asymptomatic coronary artery disease or stable angina

National Standard	All drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, unless routine commercial or age-related re-assessment applies
Information from health care providers	Confirmation that coronary artery disease is asymptomatic or angina is stable
Rationale	CCS recommendation

3.6.5 CABG surgery – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been 1 month or more since CABG surgery
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or additional • information from the treating physician
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, unless routine age-related re-assessment applies
Information from health care providers	Date of CABG surgery
Rationale	CSS recommendations

3.6.6 CABG surgery – Commercial drivers

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been 3 months or more since CABG surgery
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may request: <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment, or as recommended by the treating physician.
Information from health care providers	Date of CABG surgery
Rationale	CSS recommendations

3.6.7 Premature atrial or ventricular contractions

National Standard	All drivers eligible for a licence if <ul style="list-style-type: none"> • they have no associated impaired level of consciousness caused by cerebral ischemia
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • if there is no underlying cardiovascular disease, no re-assessment is required, other than routine commercial or age related re-assessment • where there is an underlying cardiovascular disease, RoadSafetyBC will re-assess according to the guidelines for that condition

Information from health care providers	Confirmation that there is no impaired level of consciousness caused by cerebral ischemia
Rationale	CCS recommendation

3.6.8 Ventricular fibrillation with no reversible cause – Non-commercial drivers

This standard applies to non-commercial drivers who have ventricular fibrillation (VF) with no reversible cause. It does not apply to drivers who have VF due to any of the following reversible causes:

- VF within 24 hours of myocardial infarction
- VF during coronary angiography
- VF with electrocution, or
- VF secondary to drug toxicity.

If VF has a reversible cause, it is considered a transient condition, see [3.6.11](#).

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been 6 months or more since their last episode of ventricular fibrillation
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, or as recommended by the treating physician, unless routine age-related re-assessment applies.
Information from health care providers	Date of last episode of ventricular fibrillation
Rationale	CCS recommendation

3.6.9 Ventricular fibrillation with no reversible cause – Commercial drivers

This standard applies to commercial drivers who have ventricular fibrillation (VF) with no reversible cause. It does not apply to drivers who have VF due to any of the following reversible causes:

- VF within 24 hours of myocardial infarction
- VF during coronary angiography
- VF with electrocution, or
- VF secondary to drug toxicity.

If VF has a reversible cause, it is considered a transient condition. The CCS recommendation for VF with a reversible cause is included in [3.6.11](#).

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	CCS recommendation

3.6.10 Hemodynamically unstable VT – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none">• It has been 6 months since the last episode, and• the underlying condition has been successfully treated
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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.
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years or as recommended by the treating physician, unless routine age re-assessment applies

Information from health care providers	Whether the underlying condition causing VT has been successfully treated
Rationale	CCS recommendation

3.6.11 Hemodynamically unstable VT – Commercial drivers

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	CCS recommendation

3.6.12 Sustained VT and an LVEF of < 35% – Non-commercial drivers

This standard applies to non-commercial drivers who have sustained ventricular tachycardia (VT) with:

- a left ventricular ejection fraction (LVEF) of <35% and
- no associated impaired level of consciousness.

Sustained VT means VT having a cycle length of 500 msec or less, and lasting 30 seconds or more or causing hemodynamic collapse.

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 3 months or more since their last episode of sustained VT
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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>RoadSafetyBC 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 must meet <u>3.6.27</u> requirements
Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC if you suffer an impaired level of consciousness or disability as a result of delivery of ICD therapy
Reassessment	<p>RoadSafetyBC will re-assess every five years, or as recommended by the treating physician, unless routine commercial or age-related re-assessment applies.</p>
Information from health care providers	<ul style="list-style-type: none"> • Date of last episode of sustained VT • Whether treated with an implantable cardioverter defibrillator (ICD)
Rationale	<p>CSS recommendations</p>

3.6.13 Sustained VT and an LVEF of <35% Commercial drivers

This standard applies to commercial drivers who have sustained ventricular tachycardia (VT) with:

- a left ventricular ejection fraction (LVEF) of <35% and
- no associated impaired level of consciousness.

Sustained VT means VT having a cycle length of 500 msec or less, and lasting 30 seconds or more or causing hemodynamic collapse.

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information.
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from	N/A

3.6.14 Sustained VT and an LVEF of $\geq 35\%$ Non-commercial drivers

This standard applies to non-commercial drivers who have sustained ventricular tachycardia (VT):

- with a left ventricular ejection fraction (LVEF) of $\geq 35\%$ with no associated impaired level of consciousness, and
- for whom an implantable cardioverter defibrillator (ICD) has not been recommended.

Sustained VT means VT having a cycle length of 500 msec or less, and lasting 30 seconds or more or causing hemodynamic collapse.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been 4 weeks or more since their last episode of sustained VT, and • they have been successfully treated with radiofrequency ablation plus a 1 week waiting period or successful pharmacological treatment
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess annually
Information from health care providers	<ul style="list-style-type: none"> • Date of last episode of sustained VT • Whether the driver has been successfully treated
Rationale	CCS recommendation

3.6.15 Sustained VT and an LVEF of $\geq 35\%$ Commercial drivers

This standard applies to commercial drivers who have sustained ventricular tachycardia (VT):

- with a left ventricular ejection fraction (LVEF) of $\geq 35\%$
- with no associated impaired level of consciousness, and
- for whom an implantable cardioverter defibrillator (ICD) **has not been recommended.**

Sustained VT means VT having a cycle length of 500 msec or less, and lasting 30 seconds or more or causing hemodynamic collapse.

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none">• it has been 3 months or more since their last episode of sustained VT, and• they have been successfully treated with radiofrequency ablation plus a 1 week waiting period or successful pharmacological treatment
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess annually
Information from health care providers	<ul style="list-style-type: none">• Date of last episode of sustained VT• Whether the driver has been successfully treated
Rationale	CCS recommendation

3.6.16 Non sustained VT

This standard applies to all drivers who have non-sustained ventricular tachycardia (VT).

Non-sustained VT means VT having a cycle length of 500 msec or less, and lasting less than 30 seconds without hemodynamic collapse.

National Standard	All drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	If there is no underlying cardiovascular disease, no re-assessment is required, other than routine commercial or age-related re-assessment. Where there is an underlying cardiovascular disease, RoadSafetyBC will re-assess according to the guidelines for that condition
Information from health care providers	None
Rationale	CCS recommendation

3.6.17 Paroxysmal SVT, AF or AFL with no impaired consciousness

This standard applies to all drivers who have had paroxysmal:

- supraventricular tachycardia (SVT)
- atrial fibrillation (AF), or
- atrial flutter (AFL)

with no associated impaired level of consciousness.

National Standard	All drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in five years. If there have been no further occurrences at that time, no further re-assessment is required, unless routine commercial or age-related re-assessment applies.

Information from health care providers	None
Rationale	CCS recommendation

3.6.18 Paroxysmal SVT, AF or AFL with impaired consciousness

This standard applies to all drivers who have had paroxysmal:

- supraventricular tachycardia (SVT)
- atrial fibrillation (AF), or
- atrial flutter (AFL)

with an associated impaired level of consciousness.

National Standard	<p>All drivers eligible for a licence 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 meet the standard for pacemaker treatment, and • for drivers with paroxysmal AFL, they have had a successful isthmus ablation with proven establishment of bidirectional isthmus block
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	<p>RoadSafetyBC will re-assess in five years. If there have been no further occurrences at that time, no further re-assessment is required, unless routine commercial or age-related re-assessment applies. For individuals who have had pacemaker implantation, the re-assessment guidelines under 3.6.23 and 3.6.24 apply</p>

Information from health care providers	<ul style="list-style-type: none"> • Date of last occurrence of paroxysmal SVT, AF, or AFL with impaired level of consciousness • For drivers with paroxysmal SVT, whether it has been successfully treated with radiofrequency ablation • For drivers with paroxysmal AF, whether they have had AV node ablation and pacemaker implantation • For drivers with paroxysmal AFL, whether they have had a successful isthmus ablation with proven establishment of bidirectional isthmus block
Rationale	CCS recommendation

3.6.19 Persistent or permanent paroxysmal SVT, AF or AFL

This standard applies to all drivers who have persistent or permanent paroxysmal:

- supraventricular tachycardia (SVT)
- atrial fibrillation (AF), or atrial flutter (AFL).

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • they have adequate ventricular rate control, and • they do not experience an impaired level of consciousness
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, or as recommended by the treating physician, unless routine age-related re-assessment applies
Information from health care providers	<ul style="list-style-type: none"> • Whether the driver has adequate ventricular rate control • Whether the driver experiences an impaired level of consciousness
Rationale	CCS recommendation

3.6.20 Sinus node dysfunction

National Standard	<p>All drivers eligible for a licence 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 standard for pacemaker treatment
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, unless routine commercial or age-related re-assessment applies
Information from health care providers	<ul style="list-style-type: none"> • Whether the driver has associated symptoms • Where the driver has associated symptoms, whether they have been successfully treated with a pacemaker
Rationale	CCS recommendation

3.6.21 Atrioventricular (AV) or intraventricular block – Non-commercial drivers

If a permanent pacemaker is implanted, the recommendations in [3.6.23](#) prevail.

National Standard	<ul style="list-style-type: none"> • Non-commercial drivers with <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 are eligible for a licence • Non-commercial drivers with <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 are eligible for a licence if <ul style="list-style-type: none"> ▪ they have had no associated impaired level of consciousness • Non-commercial drivers with <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 are not eligible for a licence <p>*** For each of these scenarios; if a permanent pacemaker is implanted, the recommendations in 3.6.23 prevail</p>
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, unless routine commercial or age related re-assessment applies

Information from health care providers	<ul style="list-style-type: none"> • The specific nature of the atrioventricular or intraventricular block • Where the driver has <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 • whether the driver has had any associated impaired level of consciousness • whether a permanent pacemaker is implanted
Rationale	CCS recommendation

3.6.22 Atrioventricular (AV) or intraventricular block – Commercial drivers

If a permanent pacemaker is implanted, the recommendations in [3.6.24](#) prevail.

National Standard	<ul style="list-style-type: none"> Commercial drivers with <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 are eligible for a licence Commercial drivers with <ul style="list-style-type: none"> left bundle branch block (LBBB) bifascicular block second degree AV block/Mobitz I, or first degree AV block + bifascicular block eligible for a licence if <ul style="list-style-type: none"> they have had no associated impaired level of consciousness, and the conditions for maintaining a licence are met Commercial drivers with a congenital third degree AV block are eligible for a licence if <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 a Holter showing no documented pauses > 3 seconds the conditions for maintaining a licence are met Commercial drivers with <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 are not eligible for a licence <p>***For each of the scenarios, if a permanent pacemaker is implanted, the recommendations in 3.6.24 prevail.</p>
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment

Information from health care providers	<ul style="list-style-type: none"> • The specific nature of the atrioventricular or intraventricular block • Where the driver has <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 • whether the driver has had any associated impaired level of consciousness and the results of Holter confirming no higher grade AV block • Where the driver has congenital third degree AV block, whether they have a QRS duration ≤ 110 msec and the results of a Holter showing no documented pauses ≥ 3 seconds
Rationale	CCS recommendation

3.6.23 Permanent pacemakers – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • It has been 1 week or more since pacemaker implant • They have not experienced any episodes of impaired level or consciousness since the implant • They show normal sensing and capture on a post-implant ECG, and • The conditions for maintaining a licence are met
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess every five years, unless routine age-related re-assessment applies

Information from health care providers	<ul style="list-style-type: none"> • Whether the driver has experienced any episodes of impaired level of consciousness since the implant • Whether the results of a post-implant ECG show normal sensing and capture
Rationale	CCS recommendation

3.6.24 Permanent pacemakers – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 1 month or more 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 • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Date of pacemaker implant • Whether the driver has experienced any episodes of impaired level of consciousness since the implant • Whether the results of a post-implant ECG show normal sensing and capture
Rationale	CCS recommendation

3.6.25 Declined an ICD or have an ICD implanted as primary prophylaxis – Non- commercial drivers

This standard applies to non-commercial drivers who:

- have had an implantable cardioverter defibrillator (ICD) implanted as a primary prophylaxis, or

- have declined an ICD recommended as primary prophylaxis

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.

Individuals whose ICD also regulates pacing for bradycardia must also meet the standard for permanent pacemakers in [3.6.23](#).

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II, or III • it has been 4 weeks or more since ICD implant (if applicable), and • the conditions for maintaining a licence are met (if applicable)
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	<ul style="list-style-type: none"> • Regularly check ICD at a device clinic and do not drive if there is an ICD malfunction • Report to the authority if you experience an impaired level of consciousness or disability as a result of ICD therapy
Reassessment	If the individual's condition is controlled and stable, RoadSafetyBC will re-assess every five years, unless a shorter period is recommended by the treating physician or routine age-related re-assessment applies
Information from health care providers	<ul style="list-style-type: none"> • NYHA classification • Date of ICD implant (if applicable)
Rationale	CCS recommendation

3.6.26 Declined an ICD or have an ICD implanted as primary prophylaxis – Commercial drivers

This standard applies to commercial drivers who:

- have had an implantable cardioverter defibrillator (ICD) implanted as a primary prophylaxis, or
- have declined an ICD recommended as primary prophylaxis

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.

Individuals whose ICD also regulates pacing for bradycardia must also meet the standard for permanent pacemakers in [3.6.24](#).

National Standard	Commercial drivers generally not eligible for a licence. May be eligible if <ul style="list-style-type: none"> • cardiologist assessment indicates that the annual risk of sudden incapacitation is 1% or less, and • the driver meets the standard for ICD implanted as a primary prophylaxis in non-commercial drivers 3.6.25
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC will request an assessment from a cardiologist
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess annually
Information from health care providers	Cardiologist's assessment that the annual risk of sudden incapacitation is 1% per CCS recommendation
Rationale	CCS recommendation – an ICD may sometimes be implanted in low risk patients. Individual cases may be made for allowing a commercial driver to continue driving with an ICD provided the annual risk of sudden incapacitation is felt to be 1% or less

3.6.27 ICD implanted as secondary prophylaxis for sustained VT – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if they are assessed as NYHA Class I, II, or III <ul style="list-style-type: none"> • it has been 1 week or more since ICD implant • it has been 3 months or more since their last episode of sustained VT, and • the conditions for maintaining a licence are met
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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

Conditions for maintaining licence	<ul style="list-style-type: none"> • Regularly check ICD at a device clinic and do not drive if there is an ICD malfunction • Report to the authority if you experience an impaired level of consciousness or disability as a result of ICD therapy
Reassessment	If the individual's condition is controlled and stable, RoadSafetyBC will re-assess every five years, unless a shorter period is recommended by the treating physician or routine age-related re-assessment applies.
Information from health care providers	<ul style="list-style-type: none"> • NYHA classification • Date of ICD implant • Date of last episode of sustained VT • Had driver experienced an impaired level of consciousness since ICD implant
Rationale	CCS recommendation

3.6.28 ICD implanted as secondary prophylaxis for sustained VT – Commercial drivers

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	N/A
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	CCS recommendation

3.6.29 ICD therapy (shock or ATP) has been delivered – Non-Commercial drivers

This standard applies to non-commercial 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.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none">• it has been 6 months or more since the event, and• the standard for the underlying cardiovascular condition are met
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	As per the standard for the underlying cardiovascular condition
Reassessment	As per the standard for the underlying cardiovascular condition
Information from health care providers	Date of the event
Rationale	CCS recommendation

3.6.30 ICD therapy (shock or ATP) has been delivered – Commercial drivers

National Standard	Commercial drivers are ineligible for a licence
BC Guidelines	N/A
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	CCS recommendation

3.6.31 ICD implanted as secondary prophylaxis for VF or VT – Non-commercial drivers

This standard applies to non-commercial drivers who have had an implantable cardioverter defibrillator (ICD) implanted as a secondary prophylaxis for VF or VT with an impaired level of consciousness.

When implanted as a secondary prophylaxis, the ICD is implanted to prevent sudden cardiac death in individuals who have suffered a cardiac arrest or who suffer from malignant arrhythmias that do not respond readily to medical treatment.

Individuals whose ICD also regulates pacing for bradycardia must also meet the standard for permanent pacemakers in [3.6.23](#).

National Standard	Non-commercial drivers eligible for a licence if assessed as NYHA class I, II, III <ul style="list-style-type: none">• it has been 6 months or more since their last episode of sustained symptomatic VT or syncope judged to be likely due to VT or cardiac arrest, and• the conditions for maintaining a licence are met
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	<ul style="list-style-type: none">• Regularly check ICD at a device clinic and do not drive if there is an ICD malfunction• Report to the authority if you experience an impaired level of consciousness or disability as a result of ICD therapy
Reassessment	If the individual's condition is controlled and stable, RoadSafetyBC will re-assess every five years, unless a shorter period is recommended by the treating physician or routine age-related re-assessment applies
Information from health care providers	Date of last episode of sustained symptomatic VT or syncope judged to be likely due to VT or cardiac arrest
Rationale	CCS recommendation

3.6.32 ICD implanted as secondary prophylaxis for VF or VT – Commercial drivers

National Standard	Commercial drivers not eligible for a licence.
BC Guidelines	N/A
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	CCS recommendation

3.6.33 Inherited heart disease – Non-commercial drivers

This standard applies to non-commercial drivers with the following inherited heart diseases:

- Brugada's Syndrome
- Long QT Syndrome, and
- arrhythmogenic right ventricular cardiomyopathy.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • their condition has been investigated and treated by a cardiologist, and • it has been 6 months or more since they have experienced any event causing an impaired level of consciousness
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC will request an assessment from a cardiologist
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess annually or more frequently as recommended by the driver's cardiologist
Information from health care providers	<ul style="list-style-type: none"> • Confirmation that the condition has been investigated and treated by a cardiologist • Date of last event causing an impaired level of consciousness (if applicable)

Rationale	CCS recommendation
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3.6.34 Inherited heart disease – Commercial drivers

This standard applies to commercial drivers with the following inherited heart diseases:

- Brugada's Syndrome
- Long QT Syndrome, and
- arrhythmogenic right ventricular cardiomyopathy.

National Standard	Commercial drivers generally not eligible for a licence. May be eligible if <ul style="list-style-type: none"> • an assessment by a cardiologist indicates that the annual risk of sudden incapacitation is 1% or less, and • the driver meets the standard for inherited heart disease in non-commercial drivers
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC will request an assessment from a cardiologist
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess annually
Information from health care providers	Cardiologist's assessment which indicates that the annual risk of sudden incapacitation is 1% or less
Rationale	CCS recommendation – Inherited heart diseases may sometimes be identified to pose a very low risk to patients. Individual cases can sometimes be made to allow a commercial driver to continue to drive despite the diagnosis of one of these diseases, provided the annual risk of sudden incapacitation is believed to be less than one percent

3.6.35 Medically treated valvular heart disease – Non-commercial drivers

This standard applies to non-commercial drivers with medically treated:

- aortic stenosis
- aortic regurgitation
- mitral stenosis, or
- mitral regurgitation.

National Standard	Non-commercial drivers eligible for a licence if <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
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess every five years, unless routine age-related re-assessment applies
Information from health care providers	<ul style="list-style-type: none"> • NYHA classification • Whether the driver has had an episode of impaired level of consciousness
Rationale	CCS recommendation

3.6.36 Medically treated aortic stenosis or aortic sclerosis – Commercial drivers

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none"> • they are assessed as NYHA Class I • their condition is asymptomatic • they have an aortic valve area (AVA) $\geq 1.0 \text{ cm}^2$ • 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 • the conditions for maintaining a licence are met
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	<ul style="list-style-type: none"> • Have an annual medical follow-up
Reassessment	RoadSafetyBC will re-assess annually

Information from health care providers	<ul style="list-style-type: none"> • NYHA classification • Whether condition is asymptomatic • Aortic Valve Area (AVA) • Left ventricle ejection fraction (LVEF) • Confirmation of cardiologist assessment including risk of syncope
Rationale	CCS recommendation

3.6.37 Medically treated aortic or mitral regurgitation or mitral stenosis – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I • they have a left ventricle ejection fraction (LVEF) equal or greater than 35% • they have had no episodes of impaired level of consciousness
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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.
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment
Information from health care providers	<ul style="list-style-type: none"> • NYHA classification • Left ventricle ejection fraction (LVEF) • Whether the driver has had an episode of impaired level of consciousness
Rationale	CCS recommendation

3.6.38 Surgically treated valvular heart disease – Non-commercial drivers

This standard applies to non-commercial drivers with:

- mechanical prostheses
- mitral bioprotheses with non-sinus rhythm
- mitral valve repair with non-sinus rhythm
- aortic bioprotheses
- mitral bioprotheses with sinus rhythm, or
- mitral valve repair with sinus rhythm.

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 6 weeks or more since their discharge following treatment • they have no thromboembolic complications, and • for drivers with mechanical prostheses, mitral bioprostheses with non-sinus rhythm or mitral valve repair with non-sinus rhythm, they are on anti-coagulant therapy
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every five years, unless routine age-related re-assessment applies
Information from health care providers	<ul style="list-style-type: none"> • Type of surgical treatment • Date of their discharge following treatment • Whether there are thromboembolic complications • Where applicable, whether the driver is on anti-coagulant therapy
Rationale	CCS recommendation

3.6.39 Surgically treated valvular heart disease – Commercial drivers

This standard applies to commercial drivers with:

- 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.

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 3 months or more 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 drivers with mechanical prostheses, mitral bioprostheses with non-sinus rhythm or mitral valve repair with non-sinus rhythm, they are on anti-coagulant therapy
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Type of surgical treatment • Date of their discharge following treatment • Whether there are thromboembolic complications • NYHA classification • Left ventricle ejection fraction (LVEF) • Where applicable, whether the driver is on anti-coagulant therapy
Rationale	CCS recommendation

3.6.40 Mitral valve prolapse – All drivers

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • they are asymptomatic, or • where they are symptomatic they have been assessed for arrhythmia and they meet any applicable standard for arrhythmia
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None

Reassessment	Where the condition is longstanding and asymptomatic, RoadSafetyBC will re-assess every five years, unless routine commercial or age-related re-assessment applies
Information from health care providers	Whether the driver is asymptomatic
Rationale	CCS recommendation

3.6.41 Congestive heart failure – Non-commercial drivers

If using left ventricular assist device (LVAD), see [3.6.43](#)

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • they are assessed as NYHA Class I, II, or III • they are not receiving intermittent inotropes
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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>RoadSafetyBC may find individuals fit to drive if</p> <ul style="list-style-type: none"> • they meet above standards, or • if the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every 5 years or in accordance with routine age-related re-assessment, unless more frequent re-assessment is recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • NYHA Classification • Whether the driver is receiving intermittent inotropes or using a left ventricle assist device • Results of cognitive screening
Rationale	CCS recommendations

3.6.42 Congestive heart failure – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • they are assessed as NYHA Class I or II • they have an LVEF of $\geq 35\%$ • they are not receiving intermittent inotropes
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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>RoadSafetyBC may find individuals fit to drive if</p> <ul style="list-style-type: none"> • they meet above standards; and • they are not using a left ventricle assist device • If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment, unless more frequent re-assessment is recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • NYHA Classification • LVEF • Whether the driver is receiving intermittent inotropes or using a left ventricle assist device
Rationale	CSS recommendations

3.6.43 Left ventricular dysfunction or cardiomyopathy – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence 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 • if has left ventricular assist device (LVAD) and cardiologist report indicates is stable for 2 months post implantation
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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 has left ventricular assist device (LVAD), RoadSafetyBC may find individuals fit to drive if</p> <ul style="list-style-type: none"> • they meet standard above; and • they have a continuous flow LVAD implanted • if the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC 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
Conditions for maintaining licence	No conditions are required.
Reassessment	RoadSafetyBC will re-assess every 5 years or in accordance with routine age- related re-assessment, unless more frequent re-assessment is recommended by the treating physician.
Information from health care providers	<ul style="list-style-type: none"> • NYHA Classification • Whether the driver is receiving intermittent inotropes or using an LVAD • Date and Type of LVAD implant
Rationale	CCS recommendation These guidelines are consistent with the 2012 CCS Position Statement Update on Assessment of the Cardiac Patient for Fitness to Drive: Fitness Following Left Ventricular Assist Device Implantation

3.6.44 Left ventricular dysfunction or cardiomyopathy – Commercial drivers

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none"> • they are assessed as NYHA Class I or II • they have an LVEF of equal or > 35% • they are not receiving intermittent inotropes, and • they are not using a left ventricle assist device
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment, unless more frequent re-assessment is recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • NYHA Classification • Left ventricle ejection fraction (LVEF) • Whether the driver is receiving intermittent inotropes or using a left ventricle assist device
Rationale	CCS recommendation These guidelines are consistent with the 2012 CCS Position Statement Update on Assessment of the Cardiac Patient for Fitness to Drive: Fitness Following Left Ventricular Assist Device Implantation

3.6.45 Heart transplant – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been 6 weeks or more since their discharge following transplant • they are assessed as NYHA Class I or II • they are on stable immunotherapy, and • they meet the conditions for maintaining a licence
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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

Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess every 5 years if the individual's condition is controlled, stable and asymptomatic. Otherwise, RoadSafetyBC will re-assess as recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Date of the driver's discharge following transplant • NYHA Classification • Whether the driver is on stable immunotherapy
Rationale	CCS recommendation

3.6.46 Heart transplant – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 6 months or more since their discharge following transplant • they are assessed as NYHA Class I • they have an LVEF of equal or > 35% • they are on stable immunotherapy • they have no active ischemia, and • they meet the conditions for maintaining a licence
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required.
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment, unless more frequent re-assessment is recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Date of the driver's discharge following the transplant • NYHA Classification • Left ventricle ejection fraction (LVEF) • Whether the driver is on stable immunotherapy • Whether the driver has active ischemia
Rationale	CCS recommendation

3.6.47 Hypertrophic cardiomyopathy – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> they have had no episodes of impaired level of consciousness
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess annually until the condition is controlled and stable and then every five years, unless routine age-related re-assessment applies
Information from health care providers	Whether the driver has had an episode of impaired level of consciousness
Rationale	CCS recommendation

3.6.48 Hypertrophic cardiomyopathy – Commercial drivers

National Standard	Commercial drivers eligible for a licence if <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 no non-sustained VT
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will re-assess annually until the condition is controlled and stable and then in accordance with routine commercial re-assessment

Information from health care providers	<ul style="list-style-type: none"> • Whether the driver has had an episode of impaired level of consciousness • Whether the driver has a family history of sudden death at a young age • Whether the driver's left ventricle wall thickness is < 30 mm • Whether the driver shows an increase in blood pressure with exercise • Whether the driver has any nonsustained VT on a Holter
Rationale	CCS recommendation

3.6.49 Syncope

The standards for syncope are included in Chapter 19.

3.6.50 CCS recommendations regarding transient conditions (Waiting Periods)

The **waiting periods in these recommendations form part of the standard** and 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 standards 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

Condition	Classes 5-7 (Non commercial)	Classes 1-4 Commercial
ST elevation MI	1 month after discharge	3 months after discharge
Non-ST elevation MI with significant LV damage		
Non-ST elevation MI with minor LV damage	48 hours after PCI	7 days after PCI
If PCI performed during initial hospital stay		
If PCI not performed during initial hospital stay	7 days after discharge	30 days after discharge

Acute coronary syndrome without MI (unstable angina) If PCI performed during initial hospital stay	48 hours after PCI	7 days after PCI
If PCI not performed during initial hospital stay	7 days after discharge	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

	Non-commercial	Commercial
Stable angina	No restrictions	
Asymptomatic coronary artery disease		
PCI	48 hours after PCI	7 days after PCI

Notes:

PCI: Percutaneous coronary intervention (angioplasty)

Cardiac surgery for coronary artery disease – waiting periods

	Non-commercial	Commercial
Coronary artery bypass graft	1 month after discharge	3 months after discharge

B. Disturbances of cardiac rhythm, arrhythmia devices and procedures

Catheter ablation and EPS

	Non-commercial	Commercial
Catheter ablation procedure EPS with no inducible sustained ventricular	48 hours after discharge	1 week after discharge

Notes:

EPS: electrophysiology

Disturbances of cardiac rhythm and arrhythmia devices

Ventricular arrhythmias

	Non-commercial	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 4: Cerebrovascular disease

4.1 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.

4.2 Prevalence

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 a 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 a 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 70s and 80s 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.

4.3 Cerebrovascular disease and adverse driving outcomes

Transient ischemic attack

There has been little research on the relationship between TIAs 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 CVAs 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.

4.4 Effect on functional ability to drive

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	Medical assessments
Cerebrovascular accident (CVA)	Persistent impairment: Functional assessment	Variable – cognitive, motor or sensory	Medical assessments Functional assessment
Cerebral aneurysm	Episodic impairment (risk of rupture): Medical assessment – likelihood of impairment	All – sudden impairment	Medical assessments
	Persistent impairment (where symptomatic): Functional assessment	Variable – cognitive, motor or sensory	Medical assessments Functional assessment

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.

4.5 Compensation

Drivers 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. The effectiveness of individual vehicle modifications may be determined through a road test.

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 to non-commercial driving	<ul style="list-style-type: none">• Scanning horizon more frequently• Turning head 90° to maximize area scanned• Large left and right side mirrors

4.6 Guidelines for assessment

4.6.1 Transient ischemic attack (TIA)

National Standard	All drivers eligible for a license if: <ul style="list-style-type: none">• complete medical assessment shows no residual effects• any underlying cause has been addressed with appropriate treatment• conditions for maintaining a license are met.
BC Guidelines	RoadSafetyBC will not generally request further information.
Conditions for maintaining licence	<ul style="list-style-type: none">• Remain under regular medical supervision and follow any prescribed diagnostic or treatment regime• Report any further TIAs to the authority
Reassessment	If there are no residual effects and any underlying cause has been addressed with appropriate treatment; RoadSafetyBC will re-assess in accordance with commercial or age-related re-assessment unless a shorter reassessment interval is recommended by the treating physician.
Information from health care providers	<ul style="list-style-type: none">• Date of the TIA• Whether the driver remains under regular medical supervision• Opinion of treating physician whether the driver follows any prescribed diagnostic or treatment regime

Rationale	The primary driver 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 a CVA is greatest immediately after the TIA and decreases significantly over time. Subject matter experts recommended a minimum no-driving period of two weeks, with appropriate follow-up and treatment.
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4.6.2 Cerebrovascular accident (CVA)

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Complete medical assessment shows no residual effects • 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 17.6.1), • the functional abilities necessary for driving are not impaired, and • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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, RoadSafetyBC will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held</p>
Conditions for maintaining licence	<ul style="list-style-type: none"> • Remain under regular medical supervision and follow your physician's advice regarding treatment • Report any further CVAs to the authority <p>(Note that additional conditions may be required, depending upon the nature of any functional impairment and the ability of the driver to compensate)</p>
Reassessment	If there are no residual effects and any underlying cause has been addressed with appropriate treatment, and no post-CVA seizure has occurred; RoadSafetyBC will re-assess in accordance with commercial or age-related re-assessment unless a shorter reassessment interval is recommended by the treating physician.

Information from health care providers	<ul style="list-style-type: none"> • Date of the CVA • Opinion of treating physician whether any underlying cause has been addressed with appropriate treatment • Whether the driver has experienced a post CVA seizure • Opinion of treating physician whether there may be significant residual loss of the functional abilities necessary for driving, and if yes, the results of any functional assessments the physician carried out, e.g. cognitive screen • Whether the driver remains under regular medical supervision • Opinion of treating physician whether the driver is compliant with the physician's advice regarding treatment
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

4.6.3 Cerebral aneurysm that requires surgical repair

National Standard	All drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information.
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	The primary concern with a 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 not eligible for a licence.

4.6.4 Surgery to repair a cerebral aneurysm – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been at least 3 months since the surgery, and • the driver has no symptoms of the aneurysm, or • if the driver continues to have symptoms, the symptoms do not impair the functional abilities necessary for driving
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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, RoadSafetyBC will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held</p>
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • If the individual does not have ongoing symptoms, no re-assessment, other than routine age-related re-assessment, is required • If the individual has ongoing symptoms, RoadSafetyBC will determine the appropriate re-assessment interval on an individual basis, depending upon the nature and severity of the symptoms
Information from health care providers	<ul style="list-style-type: none"> • Date of the surgery • Whether the driver experiences any symptoms of the aneurysm, and if yes, a description of the symptoms • Opinion of treating physician if any symptoms impair the functional abilities necessary for driving, and if yes, the results of any functional assessments the physician carried out
Rationale	<ul style="list-style-type: none"> • 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 • The impact of any symptoms caused by the aneurysm or by complications from surgery should be assessed

4.6.5 Surgery to repair a cerebral aneurysm – Commercial drivers

National Standard	<p>Commercial driver eligible for a licence if</p> <ul style="list-style-type: none"> • it has been at least 6 months since the surgery, and • the driver has no symptoms of the aneurysm, or • if the driver continues to have symptoms, the symptoms do not impair the functional abilities necessary for driving
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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, RoadSafetyBC will request functional assessment(s) as appropriate for the type(s) of impairment and class of licence held</p>
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • If the individual is not having symptoms, no re-assessment, other than routine commercial re-assessment, is required • If the individual is experiencing symptoms, RoadSafetyBC will determine the appropriate re-assessment interval on an individual basis, depending upon the nature and severity of the symptoms
Information from health care providers	<ul style="list-style-type: none"> • Date of the surgery • Whether the driver experiences any symptoms of the aneurysm, and if yes, a description of the symptoms • Opinion of treating physician whether any symptoms may impair the functional abilities necessary for driving, and if yes, the results of any functional assessments the physician carried out, e.g. cognitive screen
Rationale	The waiting period for commercial drivers is longer than that for non-commercial drivers in order to provide more certainty about the success of surgery prior to a return to driving

Chapter 5: Chronic renal disease

5.1 About chronic renal disease

Overview

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

5.2 Prevalence

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 (ESRD), 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.

5.3 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.

5.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach ⁵	Primary functional ability affected	Assessment tools
Chronic renal disease (Stage 3 and 4) End-stage renal disease	Persistent impairment: Functional assessment	Variable - Cognitive and Motor May also result in general debility	Medical assessments Functional Assessment
Renal transplant	Persistent impairment: Functional assessment	Variable - Cognitive and Motor	Medical assessments Functional Assessment

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.

⁵ See Part 1 for a discussion of the use of functional assessments for driver licensing decisions.

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

General debility

Drivers 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.

5.5 Compensation

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

5.6 Guidelines for Assessment

5.6.1 Stage 1 to 4 renal disease (Commercial and Non-Commercial)

National Standard	<p>All drivers are eligible for a licence if</p> <ul style="list-style-type: none"> • medical assessment shows no residual effects • the functional abilities necessary for driving are not impaired
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report; or • additional information from the treating physician
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Stage of renal disease • Functional limitations if any • Whether the driver is compliant with their current treatment regime
Rationale	<ul style="list-style-type: none"> • Stage 1 or 2 renal disease is unlikely to cause impairment of the functions needed for driving. • Drivers with stage 3 or 4 chronic renal disease are at significant risk for cognitive impairment that could impair their functional ability to drive

5.6.2 Stage 5 – End-stage renal disease – All Drivers (Commercial and Non-Commercial)

National Standard	<p>All eligible for a licence if</p> <ul style="list-style-type: none"> • Complete medical assessment by treating physician shows no residual effects • The functional abilities necessary for driving are not impaired, and • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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 possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may 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>
Conditions for maintaining licence	<ul style="list-style-type: none"> • Routinely follow prescribed dialysis regimen • Do not drive if dialysis treatment is delayed or circumstances do not allow for maintaining dialysis schedule • Remain under regular medical supervision by a treating physician to ensure that any progression of the disease or development of co-morbid conditions is monitored
Reassessment	RoadSafetyBC will re-assess annually
Information from health care providers	<ul style="list-style-type: none"> • Stage of renal disease • Functional Limitations, if any • History of compliance with prescribed dialysis regimen • Opinion of treating physician on compatibility of work schedule with dialysis regimen • Whether the driver has insight into the impact their medical condition may have on driving • If known or applicable, whether the driver is compliant with any current conditions of licence
Rationale	<p>Drivers with end-stage renal disease are at significant risk for cognitive impairment and general debility that could impair functional ability to drive. Regular dialysis is required to maintain overall functional ability</p>

5.6.3 Renal transplant

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Complete medical assessment by treating physician shows no residual effects
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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 possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may 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>
Conditions for maintaining licence	None
Reassessment	<p>If transplant has occurred within 1 year of assessment, RoadSafetyBC will re-assess in one year. At that time, if the treating physician indicates that there has been no decline in functions post-renal transplant, no further re-assessment, other than routine commercial or age-related re-assessment, is required</p>
Information from health care providers	Functional limitations, if any
Rationale	<p>Even after a successful renal transplant, there may be persistent cognitive impairment that could impair functional ability to drive</p>

Chapter 6: Cognitive impairment including dementia

6.1 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.⁶

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), and
 - (2) one or more of the following cognitive disturbances:
 - i. aphasia (language disturbance)

⁶ 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.

- 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 disorder⁷ (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.

⁷ This refers to the classification of psychiatric disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR). See Chapter 14, Psychiatric Disorders, for more information on this classification system.

Characteristics of later stages include:

- slowed rates of information processing
- attentional deficits
- disturbances in executive functions, and
- impairments in language, perception and praxis.

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 (AriceptTM), galantamine (ReminylTM) and rivastigmine (ExelonTM). 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.

A simple summary of factors in determining degree of Dementia and Mild Cognitive Impairment include:

Mild cognitive Impairment (MCI) <i>(Some memory impairment but dementia not definitively diagnosed)</i>	Mild Dementia	Moderate Dementia	Severe Dementia
Forgets name, location of objects May have trouble finding words May have difficulty traveling to new locations May have difficulty with problems at work	Has difficulty with complex tasks or instrumental activities of daily living (eg finances, shopping, planning dinner, cooking, taking medication, telephoning etc.)	Has difficulty with basics activities of daily living (eg eating, dressing hygiene) Needs help choosing and putting on clothing Requires prompting and assistance when bathing	Decreased ability to use toilet and is incontinent Vocabulary limited Loses ability to walk and sit Unable to smile

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.

6.2 Prevalence

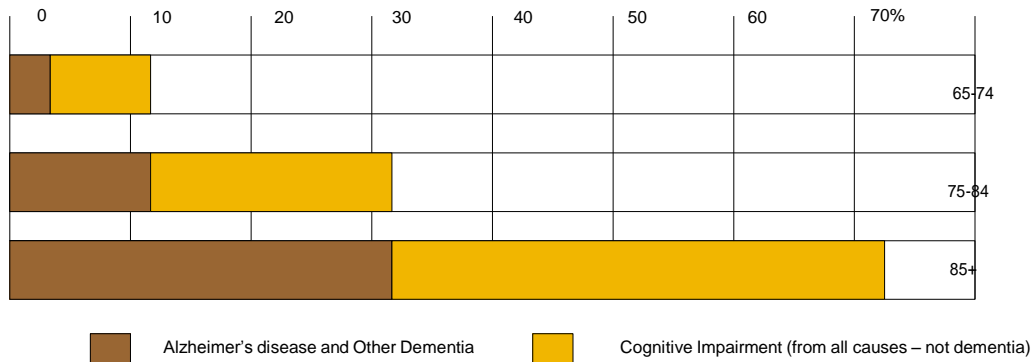
Estimates from the Canadian Study on Health and Aging (1991) suggest that 8% of all Canadians aged 65 and older meet the criteria for dementia, increasing to 34.5% for those 85 and older. A 2004 study projected that, in 2007, there would be 65,780 individuals with dementia in British Columbia, 44,130 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.

Prevalence of Dementia and Cognitive Impairment⁸



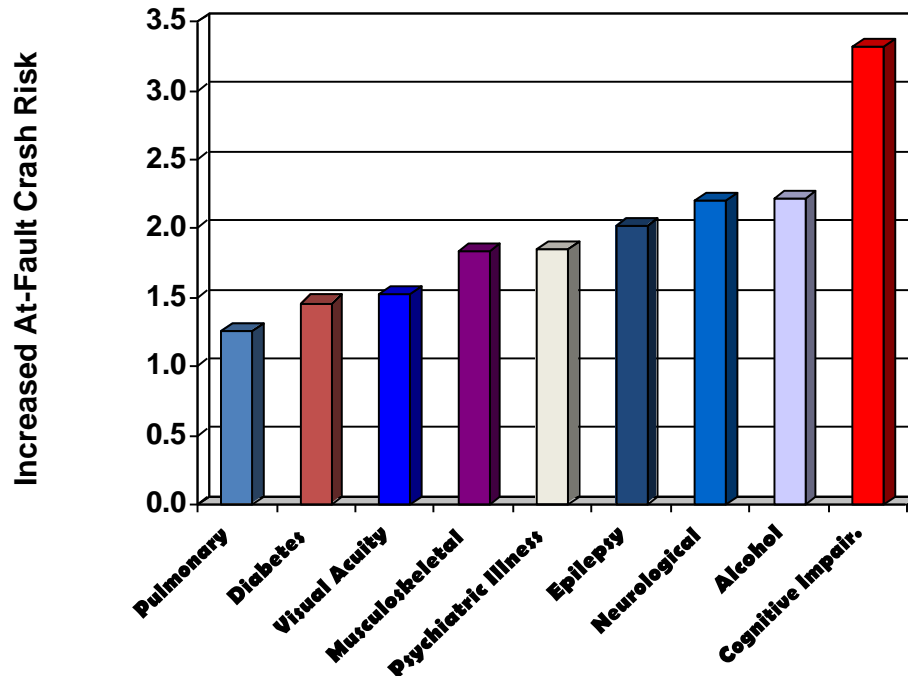
6.3 Cognitive impairment, dementia and adverse driving outcomes

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. antipsychotics, antidepressants) 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.

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 for individuals with medical conditions to those for 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.

⁸ Source: Canadian Study of Health and Aging, 1991

Risk of at-fault crash: selected medical conditions⁹



6.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
Cognitive impairment Dementia	Persistent impairment: Functional assessment	Cognitive	Medical assessments Functional Assessment

Cognitive impairment or dementia may affect one or more of the cognitive functions required for driving.

⁹ 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.

6.5 Compensation

Drivers with cognitive impairment or dementia are not able to compensate for their functional impairment.

6.6 Guidelines for assessment

6.6.1 Cognitive impairment or dementia

National Standard	Eligible for any class licence if <ul style="list-style-type: none">• Complete medical assessment indicates cognitive functions necessary for driving are not impaired, or• where required, functional driving assessment shows condition does not affect ability to drive• Conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none">• If the treating physician identifies cognitive impairment, or dementia that may impair the cognitive functions necessary for driving, RoadSafetyBC may request a driving assessment, unless;<ul style="list-style-type: none">○ there has been no significant change in the individual's condition or cognitive ability since a previous functional assessment• If cognitive screening indicates that the cognitive functions are significantly impaired, AND there is a diagnosis of cognitive impairment or dementia, OR there is compelling collateral information that indicates a safety risk, RoadSafetyBC will not generally request further assessments and the licence will be canceled unless;<ul style="list-style-type: none">○ the entirety of the file information supports a finding of sufficient cognitive function to drive safely such that an opportunity for a driving assessment may be offered, or;○ the treating physician indicates cognitive screening tests in fail range is related to other factors (e.g. level of education, language), RoadSafetyBC may provide an opportunity for a driving assessment• If the individual has been diagnosed with severe dementia; RoadSafetyBC will not generally request further information, and the licence will be cancelled. Please see 6.6.2
Conditions for maintaining licence	No conditions required
Reassessment	<ul style="list-style-type: none">• RoadSafetyBC will typically re-assess annually if an individual has<ul style="list-style-type: none">○ dementia, or○ a cognitive impairment that is progressive• Otherwise, routine commercial or age-related re-assessment

Information from health care providers	<ul style="list-style-type: none"> • Nature or cause of the cognitive impairment • Opinion of treating physician whether the cognitive impairment is progressive • Various tools such as OT driving assessments, cognitive screens and road tests may be helpful in assessing whether an individual with cognitive impairment is eligible to hold licence
Rationale	<ul style="list-style-type: none"> • Functional assessment is required to determine if individual can drive safely • The results of cognitive screening tests such as the MOCA, MMSE, Trails B, Global Deterioration Scale, and/or others, while considering the entirety of the file information, will inform whether further assessment is required

6.6.2 Severe Dementia

National Standard	Ineligible for any class of licence
BC Guidelines	<ul style="list-style-type: none"> • RoadSafetyBC will not generally request further information; and the licence will be cancelled. • Drivers are not typically eligible for a licence if the driver has: <ul style="list-style-type: none"> ○ Been diagnosed with advanced or severe dementia
Conditions for maintaining licence	Details on diagnosis
Reassessment	N/A
Information from health care providers	N/A
Rationale	A diagnosis of severe dementia indicates cognitive function is impaired to a degree that is unsafe for driving.

Chapter 7: Diabetes – Hypoglycemia

7.1 About diabetes and hypoglycemia

Diabetes

Diabetes is a chronic and progressive disease characterized by hyperglycemia (high blood glucose). It appears in two principal forms¹⁰:

- 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 and type 2 also differ in the underlying defect, and type of therapeutic control.

Type 1 diabetes

Type 1 diabetes can occur at any age, but it primarily appears before age 30. It 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

Type 2 diabetes usually occurs in individuals over the age of 40. It 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 agents¹¹, 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.

¹⁰ 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.

¹¹ Oral antihyperglycemics also may be referred to as oral hypoglycemics.

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

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.

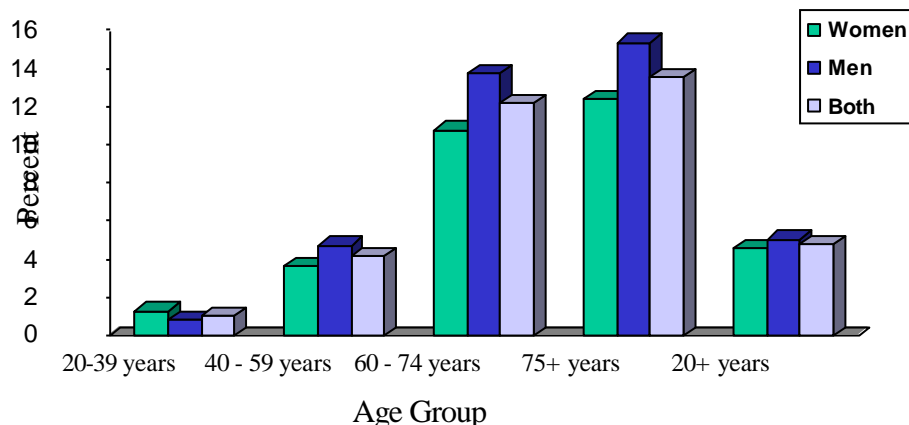
7.2 Prevalence

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 the figure 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.

7.3 Diabetes and adverse driving outcomes

Over the last twenty years the scientific evidence on the relationship between diabetes and crash risk has evolved, in part as a reflection of better management and control. Although there is some variability in results of research on drivers with diabetes, there is clear evidence to show that both non-commercial 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.

7.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
Severe hypoglycemia	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation	Medical assessments

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 standard, 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.

7.5 Compensation

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

7.6 Guidelines for assessment

7.6.1 Type 2 diabetes – All drivers

- treated with diet and exercise alone or
- oral medication - non insulin secretagogues medication, i.e. metformin or,
- oral medication - insulin secretagogues i.e. glyburide, diamicron, etc

National Standard	<p>All drivers eligible for any licence class if</p> <ul style="list-style-type: none"> • has good understanding of their condition • routinely follows their physician's instructions about diet, medication, glucose, glucose monitoring and hypoglycaemia prevention • conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • RoadSafetyBC will not generally request further information. • If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ A Driver's Medical Examination Report, or additional information from the treating physician
Conditions for maintaining licence	<ul style="list-style-type: none"> • Report to RoadSafetyBC if they begin insulin therapy, and • remains under regular medical supervision to ensure that any progression in condition or development of chronic complications does not go unattended • stops driving and treat themselves immediately if hypoglycemia is identified or suspected • does not drive until at least 45 minutes after effective treatment if glucose level is between 2.5 and 4.0 mmol/L
Reassessment	<p>If on Oral Medications and Non-Insulin Secretagogues</p> <ul style="list-style-type: none"> • RoadSafetyBC will re-assess every five years, or in accordance with the schedule for routine commercial or age-related re-assessment • RoadSafetyBC will re-assess if insulin or insulin secretagogue therapy is initiated <p>If on Oral Insulin-Secretagogues</p> <ul style="list-style-type: none"> • For Commercial Drivers, RoadSafetyBC will re-assess annually. • For Non-Commercial Drivers, if blood glucose levels and treatment are not stable, RoadSafetyBC will re-assess annually until levels and treatment are stable. If blood glucose levels and treatment are stable, RoadSafetyBC will re-assess every five years or in accordance with the schedule for age related re-assessment
Information from health care providers	Description of treatment

Rationale	<ul style="list-style-type: none"> • 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, these drivers must remain under medical supervision and undergo a reassessment at the discretion of the authority • 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 drivers on insulin therapy meet the more stringent driver fitness standards and conditions for driving • Although there is some increased risk of hypoglycemia from the use of insulin secretagogues, the risk remains less than the risk from insulin therapy
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7.6.2 Type 1 or type 2 diabetes treated with insulin – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • They understand their diabetic condition and the close interrelationship between insulin and diet and exercise, and • Routinely follow their physician's instructions about diet, medication, glucose monitoring, and hypoglycemia prevention and management • Conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or • additional information from the treating physician
Conditions for maintaining licence	<ul style="list-style-type: none"> • Remains under regular medical supervision to ensure that any progression in their condition or development of chronic complications does not go unattended • Stops driving immediately if hypoglycemia is identified or suspected • Does not drive when glucose level is below 4.0 mmol/L • Does not begin to drive when blood glucose level is between 4.0 and 5.0 mmol/L unless you first take prophylactic carbohydrate treatment • Does not drive until at least 45 minutes after effective treatment if glucose level is between 2.5 and 4.0 mmol/L • When on long drives, tests blood glucose immediately before driving and approximately every 4 hours while driving, and have an available source of rapidly absorbable glucose

Reassessment	<ul style="list-style-type: none"> • If blood glucose levels and treatment are not stable, RoadSafetyBC will re-assess annually until levels and treatment are stable. If blood glucose levels and treatment are stable, RoadSafetyBC will re-assess every five years, or in accordance with the schedule for age-related re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Description of treatment • Opinion of treating physician whether the driver understands their diabetic condition and the close interrelationship between insulin and diet and exercise
Rationale	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

7.6.3 Type 1 or type 2 diabetes treated with insulin – Commercial drivers

National Standard	<p>Commercial driver eligible for a licence if</p> <ul style="list-style-type: none"> • They obtain and retain an initial certificate of competency in blood glucose measurement from a specialist in diabetic care (when required) or a treating physician • Blood tests do not indicate uncontrolled diabetes, which are: hba1c > 12% or, > 10% of bg levels < 4.0 mmol/l • There is no significant change in insulin therapy (i.e. insulin was introduced, change in insulin type or number of injections) or, if there has been a significant change in therapy, monitoring and assessment indicate stable and effective blood glucose control • No evidence of inadequate blood glucose self-monitoring (unreliable or no home blood glucose measurement) or inadequate knowledge regarding causes, symptoms and treatment of hypoglycemia and, • Annual medical review • Conditions for maintaining a licence are met
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BC Guidelines	<ul style="list-style-type: none"> • On Original Application and Upgrade; or On Renewal/ Duplicate Licence Issuance if condition is reported for the FIRST TIME, RoadSafetyBC will require <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 <u>7.6.11</u>). To complete this form, the individual must have the results of an HbA1C 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 <u>7.6.12</u>), and ○ an Examination of Visual Function form (see a sample form in <u>22.7.4</u>) completed by an optometrist or ophthalmologist, or the results of a vision examination including testing of visual fields completed within the previous year • The individual must have available for the treating physician <ul style="list-style-type: none"> ○ records of medical care for the previous 24 months for initial assessment and 12 months for re-assessment, 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 • On subsequent driver medical examination follow-ups, if further information is required, RoadSafetyBC may request any combination of the following <ul style="list-style-type: none"> ○ additional information from the treating physician ○ a Doctor's Report on Commercial Driver with Diabetes on Insulin, OR ○ an Examination of Visual Function form completed by an optometrist or ophthalmologist
Conditions for maintaining licence	<ul style="list-style-type: none"> • their work schedule is approved by their treating physician as compatible with their insulin regimen • carries a blood glucose self-monitoring equipment and an available source of rapidly absorbable glucose • tests blood glucose concentration 1 hour or less before driving and approximately every 4 hours while driving • doesn't begin or continue to drive if glucose level falls below 6 mmol/L (108 mg/dl), and doesn't resume driving until glucose level rises above 6.0 mmol/L after food ingested

Restrictions	<p>RoadSafetyBC will place the following restriction on an individual's licence who meet the medical standard for commercial drivers with diabetes mellitus requiring insulin to treat</p> <ul style="list-style-type: none"> • R 22 (Code W) Class 1-4 Invalid in USA
Reassessment	RoadSafetyBC will re-assess annually.
Information from health care providers	<ul style="list-style-type: none"> • Description of treatment • Whether the driver has an initial certificate of competency in blood glucose measurement from a specialist in diabetic care (when required) or a treating physician • Opinion of treating physician whether the driver's work schedule is compatible with their insulin regimen • Whether blood tests indicate uncontrolled diabetes • Whether there has been a significant change in insulin therapy If there has been a significant change in insulin therapy, whether monitoring and assessment indicate a stable and effective blood glucose control • Whether there is evidence of inadequate self-monitoring of blood glucose or inadequate knowledge of the causes, symptoms and treatment of hypoglycemic reactions
Rationale	<ul style="list-style-type: none"> • Commercial drivers who are treated with insulin are at increased risk of experiencing hypoglycemia while driving. This is due to both their high level of driving exposure and to the nature of the driving task, which may make it more difficult for them to manage their blood glucose • The standard is focused on ensuring that these drivers have stable blood glucose levels and that they understand their condition and are able to effectively monitor and manage their blood glucose

7.6.4 Episode of severe hypoglycemia – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Treating physician indicates stable glycemic control re-established and authority determines are fit to drive. Time required to re-establish glycemic control varies individually • No further hypoglycemic episodes within past 6 months • Conditions for maintaining a licence are met
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BC Guidelines	<ul style="list-style-type: none"> • For episode less than 6 months - Driver fitness determinations will be made by nurse case managers. • For episode greater than 6 months - Driver fitness determinations will be made by adjudicators <p>If further information is required, RoadSafetyBC may request:</p> <ul style="list-style-type: none"> • additional information from the treating physician
Conditions for maintaining licence	<ul style="list-style-type: none"> • must test blood glucose immediately before driving and approximately every hour while driving • doesn't begin or continue to drive if blood glucose falls below 6.0 mmol/L and doesn't resume driving until blood glucose rises above 6.0 mmol/L after food ingested
Reassessment	RoadSafetyBC will re-assess 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 application guidelines for private drivers with diabetes will apply
Information from health care providers	<ul style="list-style-type: none"> • Date of the hypoglycemic episode • Opinion of treating physician whether stable glycemic control has been re-established
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 conditions are required temporarily to mitigate the increased risk of hypoglycemia

7.6.5 Episode of hypoglycemia unawareness within past year – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Has been 3 months since the episode • Treating physician indicates glycemic awareness regained and have stable glycemic control • Conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • For episode less than 6 months - Driver fitness determinations will be made by nurse case managers. • For episode greater than 6 months - Driver fitness determinations will be made by adjudicators. <p>If further information is required, RoadSafetyBC may request:</p> <ul style="list-style-type: none"> • additional information from the treating physician

Conditions for maintaining licence	<ul style="list-style-type: none"> • Must test blood glucose immediately before driving and approximately every hour while driving • Doesn't begin or continue to drive if blood glucose falls below 6.0 mmol/L and doesn't resume driving until blood glucose rises above 6.0 mmol/L after food ingested
Reassessment	RoadSafetyBC will re-assess 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
Information from health care providers	<ul style="list-style-type: none"> • Date of the episode • Opinion of treating physician whether glycemic awareness has been regained • Opinion of treating physician whether the driver has stable glycemic control
Rationale	Hypoglycemia unawareness greatly increases the risk for hypoglycemia while driving. This standard requires that glycemic awareness be re-established before driving resumes. Once awareness and glucose stability are re-established, more stringent glucose monitoring guidelines are required temporarily to mitigate the increased risk of hypoglycemia

7.6.6 Persistent hypoglycemia unawareness – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • It has been 3 months since the last episode of hypoglycemia • Treating physician indicated stable glycemic control and takes steps to ensure they do not become hypoglycemic while driving • Conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • Driver fitness determinations will be made by nurse case managers <p>If further information is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • additional information from the treating physician

Conditions for maintaining licence	<ul style="list-style-type: none"> • retains blood glucose log and reviews with treating physician at intervals physician feels necessary to monitor continued glycemic control • tests blood glucose levels immediately before driving and approximately every hour while driving • doesn't begin or continue to drive if blood glucose level falls below 6.0 mmol/L and doesn't resume driving until blood glucose rises above 6.0 mmol/L after food ingested
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess annually • If the treating physician indicates on two consecutive annual re-assessments that <ul style="list-style-type: none"> ○ awareness has been regained, and ○ there have been no 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
Information from health care providers	<ul style="list-style-type: none"> • Date of the last episode • Opinion of treating physician whether stable glycemic control has been re-established • Opinion of treating physician whether driver is willing and able to take steps to ensure they do not become hypoglycemic while driving
Rationale	Persistent hypoglycemia unawareness presents the greatest risk for hypoglycemia while driving. The standard permits non-commercial drivers to continue to drive provided they are able to maintain stable blood glucose levels and follow more stringent glucose monitoring requirements

7.6.7 Episode of severe hypoglycemia – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Treating physician indicates stable glycemic control re-established and authority determines are fit to drive. Time required to re-establish glycemic controls varies individually • No further hypoglycemic episodes within past 6 months • Conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • For episode less than 6 months - Driver fitness determinations will be made by nurse case managers. • For episode greater than 6 months - Driver fitness determinations will be made by adjudicators <p>If further information is required, RoadSafetyBC may request:</p> <ul style="list-style-type: none"> • additional information from the treating physician; or • a Doctor's Report on Commercial Driver with Diabetes on Insulin completed by the treating physician
Conditions for maintaining licence	<ul style="list-style-type: none"> • driver provides treating physician with blood glucose log of at least 4 readings per day for 30 days, where less than 5% of readings are below 4.0 mmol/L • must test blood glucose immediately before driving and approximately every hour while driving • doesn't begin or continue to drive if blood glucose falls below 6.0 mmol/L and doesn't resume driving until blood glucose rises above 6.0 mmol/L after food ingested
Reassessment	RoadSafetyBC will re-assess annually
Information from health care providers	<ul style="list-style-type: none"> • Date of the hypoglycemic episode • Opinion of treating physician whether stable glycemic control has been re-established • Statement from treating physician that driver has provided 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
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 conditions are required temporarily to mitigate the increased risk of hypoglycemia

7.6.8 Episode of hypoglycemia unawareness in the last year– Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • has been 3 months since the episode • treating physician indicates glycemic awareness regained, has stable glycemic control and authority determines are fit to drive • conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • For episode less than 6 months - Driver fitness determinations will be made by nurse case managers • For episode greater than 6 months - Driver fitness determinations will be made by adjudicators <p>If further information is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • additional information from the treating physician; or • a Doctor's Report on Commercial Driver with Diabetes on Insulin completed by the treating physician
Conditions for maintaining licence	<ul style="list-style-type: none"> • driver provides treating physician with blood glucose log of at least 4 readings per day for 30 days, where less than 5% of readings are below 4.0 mmol/L • must test blood glucose immediately before driving and approximately every hour while driving • doesn't begin or continue to drive if blood glucose falls below 6.0 mmol/L and doesn't resume driving until blood glucose rises above 6.0 mmol/L after food ingested
Reassessment	<p>RoadSafetyBC will re-assess 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</p>
Information from health care providers	<ul style="list-style-type: none"> • Date of the episode • Statement from treating physician that driver has provided 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 • Opinion of treating physician whether glycemic awareness has been regained • Opinion of treating physician whether the driver has stable glycemic control

Rationale	Hypoglycemia unawareness greatly increases the risk for hypoglycemia while driving. This standard requires that glycemic awareness be re-established before driving resumes. Once awareness and glucose stability are re-established, more stringent glucose monitoring guidelines are required temporarily to mitigate the increased risk of hypoglycemia
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7.6.9 Persistent hypoglycemia unawareness – Commercial drivers

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information.
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
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

7.6.10 Summary Table of Diabetes Conditions and Driver Medical Standards

Type II	Standard
Non-Commercial	Eligible for licence
Commercial	Eligible for licence
Type I or Type II Insulin-Treated	
Non-Commercial	Eligible for licence
Commercial	Eligible for licence <ul style="list-style-type: none"> • Annual Medical • Treating physician confirms diabetes controlled
Severe Hypoglycemia Episode	
Non-Commercial	Eligible for licence <ul style="list-style-type: none"> • no episodes within past 6 months, • Treating physician confirms stable glycemic control
Commercial	Eligible for licence <ul style="list-style-type: none"> • no episodes within past 6 months, • Treating physician confirms stable glycemic control
Episode of Hypoglycemic Unawareness	
Non-Commercial	Eligible for licence <ul style="list-style-type: none"> • No episode in past 3 months, • Treating physician confirms glycemic awareness regained
Commercial	Eligible for licence <ul style="list-style-type: none"> • No episode in past 3 months, • Treating physician confirms glycemic awareness regained
Persistent Hypoglycemic Unawareness	
Non-Commercial	Eligible for licence <ul style="list-style-type: none"> • No episode of hypoglycemia within past 3 months, • Treating physician confirms stable glycemic control
Commercial	Ineligible to Drive

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



DOCTOR'S REPORT ON COMMERCIAL DRIVER WITH DIABETES ON INSULIN (STAND-ALONE REPORT)

Doctors may bill \$... for this examination through the Teleplan billing system (see form back)

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

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Driver's Name:	
DL#:	Date Issued:
Licence Class:	Date of Birth:
PART A - GENERAL	
1. Age when diagnosed: _____ years	6a. Has there been any recent significant changes 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. How long have you treated this patient for diabetes?	6b. If "yes" does the patient have stable glycemic control? <input type="checkbox"/> YES <input type="checkbox"/> NO If "no" provide details in Part C comments section.
3. Result of one HbA1c completed within the last three months. Value: _____	Commercial drivers must present a log of blood glucose measurements performed at least twice daily for the previous six months, or since diagnosis if diagnosed in the last 6 months, to their examining physician.
4. 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	7a. Does the log indicate adequate self-monitoring of blood glucose? <input type="checkbox"/> YES <input type="checkbox"/> NO 7b. 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 take appropriate action based on blood glucose results? <input type="checkbox"/> YES <input type="checkbox"/> NO	8. Is this patient's work schedule compatible with their treatment regime? <input type="checkbox"/> YES <input type="checkbox"/> NO
PART B - HYPOGLYCEMIA	
9a. Has the patient had any hypoglycemic reactions during the past six months of which you are aware? <input type="checkbox"/> YES <input type="checkbox"/> NO	10. Does the glycemic log indicate that >10% of BG levels are <4.0 mmol/L? <input type="checkbox"/> YES <input type="checkbox"/> NO
9b. If "yes", provide the date(s) and type(s) of treatment in Part C comments (i.e. self-treated, treated by another person or by a medical professional).	11. Does patient have hypoglycemia unawareness? <input type="checkbox"/> YES <input type="checkbox"/> NO If "yes" provide details in Part C comments section.
PART C - OTHER RELEVANT COMMENTS OR CONCERNS	
COMMENTS	
PHYSICIAN'S SIGNATURE	EXAMINING PHYSICIAN'S NAME AND ADDRESS
EXAMINATION DATE (YYYY/MM/DD)	(print name or use stamp)
The personal information is collected under section 26 (a) and (c) of the <i>Freedom of Information and Protection of Privacy Act</i> for the purpose of administering the <i>Motor Vehicle Act</i> . If you have any questions about the collection, use and disclosure of the information collected, contact RoadSafetyBC at PO Box 9254 Stn Prov Govt, Victoria BC, V8W 9J2, phone 250-387-7747.	

Ministry of Public Safety
and Solicitor General

RoadSafetyBC
www.gov.bc.ca/roadsafetybc

PO Box 9254 Stn Prov Govt
Victoria BC V8W9J2

Telephone: (250) 387-7747
Facsimile: (250) 356-5577

MV2401B (02/16)

To the Driver:

- Under section 29 of the *Motor Vehicle Act* the Superintendent of Motor Vehicles requires you to have these forms completed as part of your driver fitness review for one of the following reasons:
 - you have recently been identified as having diabetes
 - it is time to review the status of your previously reported diabetes
- These forms must be completed and returned to RoadSafetyBC by your doctor along with your Driver's Medical Examination Report. 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 RoadSafetyBC within 45 days.
- If you need medical approval prior to obtaining a driver's licence, you will be unable to obtain that licence until this and other required forms have been reviewed and approved.
- If your driver's licence is cancelled, you will not be able to drive until this and other required forms are submitted and you are issued a new driver's licence.
- RoadSafetyBC may be billed \$____ by your doctor through the Teleplan billing system for completing this form. RoadSafetyBC has no authority to set the fee doctors charge. Doctors are entitled to set their own fee and to bill patients directly for either their full fee or any portion of the fee that exceeds the \$____ the doctor may bill through Teleplan.
- The Teleplan arrangement avoids the cost of setting up a duplicate billing system and maximizes the fee that can be paid to doctors for completing this form. However, it also means that there is no duplicate process at RoadSafetyBC or elsewhere to reimburse any patient or other party when doctors elect to bill privately. That is, there is no reimbursement by RoadSafetyBC of fees that are billed directly to the patient.
- Should you have questions please contact the Driver Medical Fitness Program, RoadSafetyBC, Victoria at (250) 387-7747.

To the Doctor:

- The fee code to submit for Teleplan billing is on the front of the form.

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



DRIVER'S REPORT – COMMERCIAL DRIVER WITH DIABETES ON INSULIN

Driver's Name	DL #	Date Issued

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

- How would you treat a hypoglycemic reaction? _____
- Do you carry food and glucose (sugar) on your person? ☐ YES ☐ NO
- 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: _____
- 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 6.0 mmol/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 or Driver's Medical Examination Report (DMER) provided to me by RoadSafetyBC.
- 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.

- 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.
- I understand that inaccurate, misleading, missing or false information may lead to denial or cancellation of my driver's licence.
- I authorize the release of all reports from medical specialist(s) pertaining to disease, disabilities and conditions that may affect driving to RoadSafetyBC.

SIGNATURE:		TELEPHONE No.:	
ADDRESS:		DATE:	
<small>The personal information is collected under section 26 (a) and (c) of the Freedom of Information and Protection of Privacy Act for the purpose of administering the Motor Vehicle Act. If you have any questions about the collection, use and disclosure of the information collected, contact RoadSafetyBC at PO Box 9254 Stn Prov Govt, Victoria BC, V8W 9J2, phone 250-387-7747.</small>			

Ministry of Public Safety
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MV 2402A (02/16)

Chapter 8: General debility and lack of stamina

8.1 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 deficits in attention, concentration, memory, development and/or learning.

Some of the medical conditions included in this part 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 document 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, HIV)
- malignancies, and
- conditions resulting in chronic pain.
- Metabolic diseases such as: Thyroid Diseases, Pituitary Diseases and Adrenal Diseases.

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 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.

8.2 Prevalence

No data are available on the prevalence of general debility or lack of stamina in Canada.

8.3 General debility, lack of stamina and adverse driving outcomes

No research is available on the relationship between general debility or a lack of stamina and driving outcomes.

8.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
General debility Lack of stamina	Persistent impairment: Functional assessment	Cognitive and Motor	Medical assessments Functional assessments

Both a lack of stamina and general debility may impair a driver's motor and/or cognitive functions necessary for driving.

A driver suffering from a lack of stamina may experience:

- Fatigue
- physical disability, and/or
- cognitive impairment such as loss of attention, concentration and memory.

A driver 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.

8.5 Compensation

A driver cannot compensate for general debility or a lack of stamina that impairs the functions necessary for driving.

8.6 290 Guidelines for assessment

8.6.1 Frailty, weakness or general debility

National Standard	All drivers eligible for a licence if <ul style="list-style-type: none">the results of a functional assessment indicate that the functions necessary for driving are not impaired
BC Guidelines	If the treating physician indicates that an individual has general debility, frailty, reduced reaction time, lack of stamina or weakness <ul style="list-style-type: none">RoadSafetyBC may request an ICBC road test
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every two years, unless information of file indicates earlier follow up is indicated, or the treating physician recommends annual re-assessment
Information from health care providers	Description of any cognitive and/or motor impairments Results of Functional Assessment
Rationale	Frailty, weakness or general debility may include one or more cognitive or motor impairments. Licensing decisions should be based on individual functional assessments

Chapter 9: Hearing loss

9.1 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.

9.2 Prevalence

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.

9.3 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).

9.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
Hearing loss	Persistent impairment: Functional assessment	Sensory - Hearing	Audiometric assessment

The effect of hearing loss on functional ability to drive has not been established.

9.5 Compensation

Drivers with hearing loss may compensate for this impairment using auditory aids.

9.6 Guidelines for Assessment

9.6.1 Hearing loss – Non-commercial drivers

National Standard	All drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	Routine
Information from health care providers	None
Rationale	There is insufficient evidence to support a minimum hearing requirement for non-commercial drivers

9.6.2 Hearing loss – Commercial drivers

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

National Standard	<ul style="list-style-type: none"> Eligible for class 2 and 4 driver licence, and classes 1, 3 and 5 when transporting dangerous goods, if either <ul style="list-style-type: none"> Perceives a forced whispered voice at not less than 5 (1.5 metres) feet with or without the use of a hearing aid ; or Hearing loss no greater than 40dB averaged at 500, 1000, and 2000 Hz in their better ear
BC Guidelines	<p>RoadSafetyBC may find individuals fit to drive <u>any type</u> of commercial vehicles if</p> <ul style="list-style-type: none"> they meet standard above On initial application or if the treating physician indicates a change in hearing ability in a licensed commercial driver who previously met the hearing standard above, RoadSafetyBC will request an audiometric assessment conducted by an <ul style="list-style-type: none"> otolaryngologist audiologist, or a hearing clinic operated by BC Ministry of Health
Conditions for maintaining licence	No conditions are required
Restrictions	<ul style="list-style-type: none"> RoadSafetyBC 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 <ul style="list-style-type: none"> R23 Must wear hearing aid If the audiometric assessment indicates that an individual does not meet the hearing standard, RoadSafetyBC will apply <ul style="list-style-type: none"> R51 Visible low air warning device (FOR CLASS 1,2 and 3 ONLY); and R22 (Code W) Class 1-4 Invalid in USA (FOR 1, 2, 3 and 4)
Reassessment	RoadSafetyBC will re-assess in accordance with routine commercial re-assessment
Information from health care providers	Results of a recent auditory testing

<p>Rationale</p>	<ul style="list-style-type: none"> • 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 • Drivers with hearing loss must be able to adequately compensate for their hearing loss when completing a required pre-trip inspection • 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 • 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>The US FMCSA whisper test is described as:</p> <ul style="list-style-type: none"> • For the whispered voice test, the individual should be stationed at least 5 feet from the examiner with the ear being tested turned toward the examiner • The other ear is covered • Using the breath which remains after a normal expiration, the examiner whispers words or random numbers such as 66, 18, 23, etc • The examiner should not use only sibilants (s-sounding test materials) • The opposite ear should be tested in the same manner
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9.6.3 Hearing report



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, RoadSafetyBC will reimburse the audiologist directly for the Hearing test and completion of this Hearing Report form (see form back for details).

THIS REPORT MUST BE COMPLETED IN FULL AND RETURNED WITHIN 30 DAYS TO ROAD SAFETY BC

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			

PLEASE COMPLETE THE FOLLOWING:

YES NO

- Is hearing loss progressive? ☐ YES ☐ NO
- Can hearing be corrected with an aid? ☐ YES ☐ NO
- Was an aid prescribed? ☐ YES ☐ NO

EXAMINING Audiologist NAME AND ADDRESS (USE RUBBER STAMP OR PRINT)		RECOMMENDATIONS - FOR OFFICE USE ONLY	
TELEPHONE NUMBER: SIGNATURE OF the Audiologist DATE OF EXAM _____ (YYYY/MM/DD)		<input type="checkbox"/> DOES NOT MEET GUIDELINES <input type="checkbox"/> MEETS GUIDELINES - NO RESTRICTION <input type="checkbox"/> MEETS GUIDELINES - WITH RESTRICTIONS <input type="checkbox"/> RESTRICTIONS ADDED <input type="checkbox"/> 22 <input type="checkbox"/> 23 or 51 NAME (PLEASE PRINT) _____ OFFICE _____ _____ (YYYY/MM/DD)	
The personal information is collected under section 26(a) and (c) of the <i>Freedom of Information and Protection of Privacy Act</i> for the purpose of administering the <i>Motor Vehicle Act</i> . If you have any questions about the collection, use and disclosure of the information collected, contact RoadSafetyBC at PO Box 9254 Stn Prov Govt, Victoria BC, V8W 9J2, phone 250-387-7747.			
Ministry Public Safety and Solicitor General MV0723 (02/16)	RoadSafetyBC	PO Box 9254 Stn Prov Govt Victoria BC V8W9J2 www.pssg.gov.bc.ca/roadsafetybc	Telephone: (250) 387-7747 Facsimile: (250) 356-5577

To the Driver:

- Under section 29 of the *Motor Vehicle Act* the Superintendent of Motor Vehicles requires you to have this form completed as part of your driver fitness review because of one of the following reasons:
 - you have recently been identified as having a hearing loss; or
 - your treating physician indicates a change in your hearing ability since being licensed as commercial driver and previously had met the hearing standard above.
- This form must be completed and returned to RoadSafetyBC by your audiologist. 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 RoadSafetyBC within 30 days.
- If you need medical approval prior to obtaining a driver's licence, you will be unable to obtain that licence until this and other required forms have been reviewed and approved.
- If your driver's licence is cancelled, you will not be able to drive until this and other required forms are submitted and you are issued a new driver's licence.

To the Audiologist:

- RoadSafetyBC will reimburse the cost of the Hearing test and completion of this Hearing Report form, up to a maximum of \$___, upon receipt of the report and an invoice
- The report must be faxed to the Driver Medical Fitness program at: (250)-952-6888.
- The invoice must contain the driver's full name and driver's licence number and may be emailed to: roadsafetybc.finance@gov.bc.ca, or mailed to the mailing address:
 - Mailing Address – RoadSafetyBC, PO Box 9254 Stn Prov Gov, Victoria BC V8W 9J2
- Any additional fees or charges billed by the audiologist are the responsibility of the driver.
- Should you have questions please contact the Driver Medical Fitness Program, RoadSafetyBC, Victoria at (250) 387-7747.

Chapter 10: Intracranial tumours

10.1 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, size and 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 tumour type, location and rate of growth, and can affect cognitive, motor or sensory functions.

Examples of possible impairments include:

- cognitive impairment
- epilepsy
- personality changes
- focal weakness, and
- sensory disturbances

The presentation of impairments may be progressive or variable.

10.2 Prevalence

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.

10.3 Intracranial tumours and adverse driving outcomes

No studies on the effects of intracranial tumours on driving were found.

10.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
Intracranial tumour	Persistent impairment: Functional assessment	Variable – cognitive, motor or sensory	Medical assessments Functional assessment
	Episodic impairment: Medical assessment – likelihood of impairment	Variable – sudden impairment (epilepsy)	Medical assessments

An intracranial tumour may result in a persistent cognitive, motor or sensory impairment, or an episodic impairment (epilepsy), or both.

10.5 Compensation

Drivers 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 knobRestriction to automatic transmission or power-assisted brakes	<ul style="list-style-type: none">Scanning horizon more frequentlyTurning head 90° to maximize area scannedLarge left and right side mirrors

10.6 Guidelines for assessment

10.6.1 Intracranial tumour

If a driver has epilepsy as a result of an intracranial tumour, also see the standards in [Chapter 17](#).

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none">• movement and strength are sufficient to perform the functions necessary for driving• cognitive and visual functions necessary for driving are not impaired• any pain associated with the condition, and any treatment for the condition, do not impair the functional abilities necessary for driving• where required, a road test or other functional assessment indicates that the driver is able to compensate for any loss of functional ability necessary for driving, and• the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none">• If further information regarding an individual's medical condition is required, RoadSafetyBC may request<ul style="list-style-type: none">○ a Driver's Medical Examination Report○ additional information from the treating physician, or○ an assessment from a specialist.• If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Restrictions	<p>RoadSafetyBC may 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> <ul style="list-style-type: none">• 26 Specified vehicle modifications required• 28 Restricted to automatic transmission• 51 [specify type of restriction]

Reassessment	RoadSafetyBC will re-assess every 5 years or in accordance with routine commercial or age-related re-assessment, unless a shorter re- assessment interval is recommended by the treating physician. No further re-assessment is required if the tumour is successfully removed
Information from health care providers	<ul style="list-style-type: none"> • Whether the driver suffers from epilepsy as a result of the tumour. See the standards under <u>Chapter 17</u> if epilepsy is present • Opinion of treating physician on whether the driver has a loss of movement or strength that may affect functional ability to drive • Opinion of treating physician on whether pain or treatment may adversely affect functional ability to drive • Opinion of treating physician on whether the driver suffers from diplopia and/or a visual field deficit that may affect functional ability to drive. See the standards under <u>Chapter 22</u> if the treating physician indicates that either of these conditions may be present. • Results of cognitive assessment • Where required, the results of a functional assessment
Rationale	The potential functional impairments associated with an intracranial tumour are variable

Chapter 11: Musculoskeletal conditions

11.1 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 and authorities do not assess drivers with transient impairments.

11.2 Prevalence

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.

11.3 Musculoskeletal conditions and adverse driving outcomes

Few studies have specifically examined the relationship between musculoskeletal conditions 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 drivers 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 15, Psychotropic Drugs.

11.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach ¹²	Primary functional ability affected	Assessment tools
Loss of limb	Persistent impairment: Functional assessment	Motor	Medical assessments
Diseases of the joints			Functional assessment
Disabilities of the spine			
Deformity			

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. Drivers 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 task such as steering, cornering, reversing, head turns and shoulder checks.

¹² See Part 1 for a discussion of the use of functional assessments for driver licensing decisions.

11.5 Compensation

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

Strategies

For loss of limb, a driver may compensate through the use of a prosthetic device when driving. Other strategies that do not require vehicle modifications may also be used to compensate, 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

Drivers 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 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.

11.6 Guidelines for assessment

11.6.1 Loss of upper or lower extremities-All Drivers

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • a road test indicates ability to compensate for any loss of functional ability required for driving, and • the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • RoadSafetyBC will typically 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 • If further assessment is required, RoadSafetyBC may request: <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 • Non-commercial drivers with: a left leg amputation, no Restriction 28 on the driving record, no other concerns noted from reporting doctor, and no information to indicate that a road test re-exam is required will have a R 28 added to their licence by RoadSafetyBC
Conditions for maintaining licence	No conditions are required
Restrictions	<p>RoadSafetyBC 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> <ul style="list-style-type: none"> • R 25 Fitted prosthesis/leg brace required • R 26 Specified vehicle modifications required • R 28 Restricted to automatic transmission
Reassessment	<ul style="list-style-type: none"> • If the loss of limb is not the result of a medical condition that is progressive, RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment • If the loss of limb is the result of a medical condition that is progressive, the re-assessment guidelines for that medical condition apply
Information from health care providers	<ul style="list-style-type: none"> • Results of a road test in a vehicle with the permitted modifications or devices required • Health professional's opinion as to whether the driver has insight into the impact their loss of limb may have on driving

Rationale	The impact of a loss of limb on fitness to drive is variable and must be determined by an individual functional assessment
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11.6.2 Chronic musculoskeletal condition

Chronic musculoskeletal conditions include diseases of the joints, disabilities of the spine and deformity.

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> the driver retains sufficient movement and strength to perform the functions necessary for driving pain associated with the condition, or the drugs used to treat the condition, do not adversely affect ability to drive safely where required, a road test or other functional assessment indicates ability to compensate for any loss of functional ability required for driving, and the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> If further information regarding an individual's medical condition is required, RoadSafetyBC may request <ul style="list-style-type: none"> a Driver's Medical Examination Report, or additional information from the treating physician If the treating physician indicates loss of range of motion, and/or weakness <ul style="list-style-type: none"> RoadSafetyBC will typically 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. If an ICBC driver examiner recommends further assessment, RoadSafetyBC may request <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
Conditions for maintaining licence	No conditions are required

Restrictions	<p>RoadSafetyBC 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> <ul style="list-style-type: none"> • R25 Fitted prosthesis/leg brace required • R26 Specified vehicle modifications required • R28 Restricted to automatic transmission
Reassessment	<p>RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment, unless re-assessment is recommended by the treating physician.</p>
Information from health care providers	<ul style="list-style-type: none"> • Opinion of treating physician on whether the driver has a loss of range of motion or strength that may affect functional ability to drive • Opinion of treating physician on whether pain or drugs may adversely affect functional ability to drive • Where required, the results of a functional assessment • Opinion of treating physicians as to whether the driver has insight into the impact their condition may have on driving • History of compliance with prescribed treatment regime • If known or applicable, whether the driver is compliant with any current conditions of licence related to their condition
Rationale	<p>The impact of a chronic musculoskeletal condition on fitness to drive is variable and must be determined by an individual functional assessment</p>

Chapter 12: Neurological disorders

12.1 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

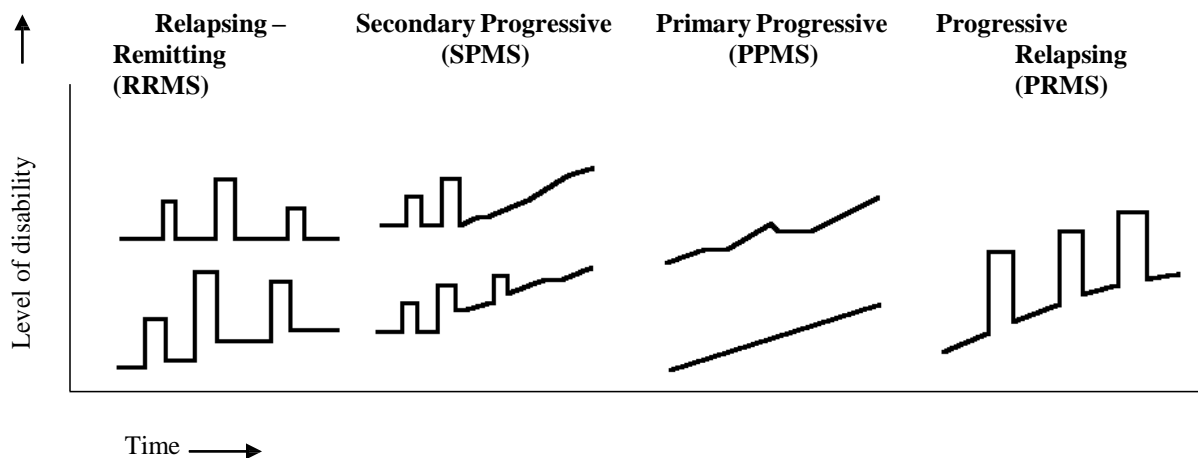
Primary Progressive (PPMS)

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.¹³



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 progressive, and while the specific cause is unknown, it is believed that both genetic and environmental factors contribute to the development of the disease.

¹³ Source: The Multiple Sclerosis Information Trust, <http://www.mult-sclerosis.org>.

Cerebral palsy

Cerebral palsy refers to any one of a number of neurological disorders that appear in infancy or early childhood and are 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.

12.2 Prevalence

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%).¹⁴

MS is twice as likely to affect women as men, with the highest incidence occurring in individuals in their late 30s, and the highest prevalence among those in their 40s and 50s.

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.

12.3 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.

¹⁴ 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.

12.4 Effect on functional ability to drive

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	Medical assessments Functional assessment

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
- antiepileptics
- antidepressants
- antispasticity drugs, and
- opioids.

See [Chapter 15, 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
- 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.

12.5 Compensation

Drivers 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

12.6 Guidelines for assessment

12.6.1 Neurological disorder

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • range of motion, strength and coordination are sufficient to perform the functions necessary for driving • cognitive functions necessary for driving are not impaired • any pain associated with the condition, and any drugs used to treat the condition, do not impair the functional abilities necessary for driving • where required, a road test or other functional assessment indicates that the driver is able to compensate for any loss of functional ability necessary for driving, and • the conditions for maintaining a licence are met
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BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may 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 • If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may 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.
Conditions for maintaining licence	No conditions are required.
Restrictions	<p>RoadSafetyBC 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> <ul style="list-style-type: none"> • 26 Specified vehicle modifications required • 28 Restricted to automatic transmission • 51 [specify type of restriction]
Reassessment	<ul style="list-style-type: none"> • If the neurological disorder is progressive (e.g., multiple sclerosis or Parkinson's disease), RoadSafetyBC will re-assess every 5 years or in accordance with routine commercial or age-related re-assessment, unless a shorter re-assessment interval is recommended by the treating physician • If the neurological disorder is not progressive (e.g., cerebral palsy), no re-assessment is required, other than routine commercial or age-related re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Opinion of treating physician on whether the driver has a loss of range of motion, strength or coordination that may affect functional ability to drive • Opinion of treating physician on whether pain or drugs may adversely affect functional ability to drive • Where required, the results of cognitive assessment • Where required, the results of a functional assessment
Rationale	The potential functional impairments associated with neurological disorders are variable

Chapter 13: Peripheral vascular diseases

13.1 About peripheral vascular diseases

Overview

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 aneurysmal 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.

13.2 Prevalence

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% of 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 lower extremity PAD are:

- 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, and
- 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 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.

13.3 Peripheral vascular diseases and adverse driving outcomes

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

13.4 Effect on functional ability to drive

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	Medical assessments Functional assessment
Abdominal aortic aneurysm	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation	Medical assessments
Aortic dissection	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation	Medical assessments
DVT - may result in pulmonary embolism	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation	Medical assessments

Peripheral arterial disease

For drivers with peripheral arterial disease, the chronic outcomes of the disease will rarely affect driving ability. 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, drivers who are asymptomatic or have mild to moderate claudication are unlikely to have symptoms that would affect driving. Drivers 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 drivers with an abdominal aortic aneurysm, acute complications may affect driving ability. 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 drivers experiencing a rupture lose consciousness almost immediately. As with AAA, the primary concern for a driver 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.

Deep vein thrombosis

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

13.5 Compensation

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

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

- for loss of limb, a driver may compensate through the use of a prosthetic device when driving
- drivers 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.

13.6 Guidelines for assessment

13.6.1 Peripheral arterial disease

If a driver has lost a limb due to peripheral arterial disease, also see standard [11.6.1](#).

National Standard	All drivers eligible for a licence if <ul style="list-style-type: none"> • the peripheral arterial disease is successfully treated
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BC Guidelines	<ul style="list-style-type: none"> • If further information on an individual's medical condition is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report, or ○ additional information from the treating physician • If the treating physician indicates that the individual has severe claudication, or foot and leg symptoms that may impair their functional ability to drive, RoadSafetyBC may request an ICBC road test • If an ICBC driver examiner recommends further assessment, RoadSafetyBC may request <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
Conditions for maintaining licence	No conditions are required
Reassessment	<ul style="list-style-type: none"> • For non-commercial drivers, RoadSafetyBC will re-assess every 5 years if successfully treated or mild claudication. RoadSafetyBC may re-assess more frequently, upon the recommendation of the treating physician, if moderate or severe claudication • For commercial drivers, routine commercial re-assessment applies, unless more frequent re-assessment is recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Opinion of treating physician on whether there is severe claudication or foot and leg symptoms that may impair functional ability to drive • Where required, the results of a functional assessment • Opinion of the treating physician regarding whether the driver has insight into the impact their medical condition may have on driving • Whether the driver is compliant with their current treatment regime
Rationale	Where peripheral arterial disease results in a functional impairment, the impact of the impairment on driving should be determined by an individual functional assessment.

**13.6.2 Abdominal aortic aneurysm or medically treated aortic dissection –
Non- commercial drivers**

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> the aneurysm or dissection is not at the stage of imminent rupture as determined by size, location or recent change, and for men, the diameter of the aneurysm or dissection is < 6.5 cm and the conditions for maintaining a licence are met, or for women, the diameter of the aneurysm or dissection is < 6 cm and the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Reassessment	<p>If the diameter of the aneurysm or dissection is over 5 cm, RoadSafetyBC will re-assess annually. If the diameter is between 4 and 5 cm, RoadSafetyBC will re-assess every two years. If the diameter is under 4 cm, RoadSafetyBC will re-assess every 5 years, unless routine age-related re- assessment applies</p>
Information from health care providers	<ul style="list-style-type: none"> Size of aneurysm or dissection in greatest diameter Whether condition is regularly reviewed
Rationale	<ul style="list-style-type: none"> The primary 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 non-commercial drivers has been set at just over the point at which surgery to repair the aneurysm or dissection is generally considered advisable given the risk of 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

13.6.3 Abdominal aortic aneurysm or medically treated aortic dissection – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> the aneurysm or dissection is not at the stage of imminent rupture as determined by size, location or recent change, and for men, the diameter of the aneurysm or dissection is < 6 cm and the conditions for maintaining a licence are met, or for women, the diameter of the aneurysm or dissection is < 5.5 cm, and the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	No conditions are required
Reassessment	<ul style="list-style-type: none"> If the diameter of the aneurysm or dissection is over 4 cm, RoadSafetyBC will re-assess annually. If the diameter is between 3 and 4 cm, RoadSafetyBC will re-assess every two years If the diameter is under 3 cm, RoadSafetyBC will re-assess every 3 years
Information from health care providers	<ul style="list-style-type: none"> Size of aneurysm or dissection in greatest diameter Whether condition is regularly reviewed

Rationale	<ul style="list-style-type: none"> • The primary 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 commercial drivers has been set at 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 non-commercial drivers to reflect the additional risk presented by the increased driving exposure for commercial drivers • 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
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13.6.4 Surgically repaired abdominal aortic aneurysm or surgically treated aortic dissection

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • the abdominal aortic aneurysm has been surgically repaired, or the aortic dissection has been surgically treated, and • the treating physician supports a return to driving
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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, RoadSafetyBC may request a report from the vascular surgeon supporting return to driving"</p>
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment
Information from health care providers	Opinion of the treating physician whether the surgery was successful in repairing the aneurysm or treating the dissection

Rationale	<ul style="list-style-type: none"> • The primary 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 • 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
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13.6.5 Deep vein thrombosis

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • treated with an anticoagulant, and • treating physician states that the treatment is effective
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Whether the driver is being treated with an anticoagulant • Treating physician's opinion that the DVT has been successfully treated • Whether the driver has insight into the impact their medical condition may have on driving • Whether the driver is compliant with their current treatment regime
Rationale	The primary concern with DVT is the risk of sudden incapacitation due to a pulmonary embolism

Chapter 14: Psychiatric disorders

14.1 About psychiatric disorders

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)¹⁵, 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 classified psychiatric disorders by diagnostic category, based on five axes. The five axes, 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">• 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 this document. Axis IV addresses external factors that may impact a driver's physical or psychological health and are not addressed in this document. Axis V, the Global Assessment of Functioning, is a 0 to 100 scale used for reporting a clinician's

¹⁵ DSM-IV-TR was published in 2000. Publication of the DSM-V is expected in 2013.

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 6, 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. Alcohol and illicit drug use disorders are not considered in this document. The effects of drugs commonly prescribed for medical conditions are addressed in Chapter 15, 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 categories¹⁶:

- 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.
- 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, express emotion, initiate activities or become motivated.

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

¹⁶ Monash Report 213, April 2004, pg. 272-73

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. Mental retardation is not considered in this document.

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, drivers 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 document, affect will be considered as one of the functional abilities needed for driving for drivers with psychiatric disorders.

Psychomotor

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

14.2 Prevalence

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%.

14.3 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 15, 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 15](#), Psychotropic Drugs, for more information.

Attention-Deficit/Hyperactivity Disorder

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 and 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 15](#), 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 drivers 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.

14.4 Effect on functional ability to drive

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	Medical assessments Functional assessment
	Episodic impairment: Medical assessment – likelihood of impairment	Cognitive Psychomotor	Medical assessments
Personality disorders	Persistent impairment: Functional assessment	Affective	Medical assessments
	Episodic impairment: Medical assessment – likelihood of impairment	Affective	Medical assessments

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

The role of insight

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

Drivers 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 driver's role in a crash or repeated involuntary admissions to hospital, often as a result of discontinuing prescribed medication.

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.

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 15](#), Psychotropic Drugs.

14.5 Compensation

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

14.6 Guidelines for assessment

14.6.1 Psychiatric disorder– All drivers

National Standard Note: Requires ballot as 6 months is dropped	All drivers eligible for a licence if <ul style="list-style-type: none">• the condition is stable• the driver has sufficient insight to stop driving if condition becomes acute• the functional abilities necessary for driving are not impaired• a treating physician supports a return to driving, for drivers who have stopped driving due to a psychiatric disorder, and• the conditions for maintaining a licence are met
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BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may request <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 • If the treating physician indicates that the individual may have persistent functional impairment as a result of the condition or its treatment, RoadSafetyBC may request functional assessment(s) as appropriate for the type of impairment(s) and class of licence held
Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC if you are hospitalized due to a mental health issue or if you have a relapse or deterioration of your mental health condition; and • you must remain under regular medical supervision and follow your physician's advice regarding treatment
Reassessment	<ul style="list-style-type: none"> • For individuals who have had a psychotic episode, RoadSafetyBC will re-assess annually until the treating physician indicates there have been no further psychotic episodes • Otherwise, RoadSafetyBC will determine the appropriate re-assessment interval for individuals with a psychiatric disorder on an individual basis
Information from health care providers	<ul style="list-style-type: none"> • Opinion of treating physician whether the condition is stable and controlled • Opinion of treating physician whether the driver has sufficient insight to stop driving if condition becomes acute • Opinion of treating physician whether the functional abilities necessary for driving may be persistently impaired by the condition or its treatment, and if yes, the results of a functional assessment • Whether the driver remains under regular medical supervision • Details of any prescribed psychotropic medication regime or other recommended treatment and opinion of treating physician whether the driver is compliant with the treatment • A specialist's report supporting a return to driving, for drivers who have stopped driving due to a psychotic episode • Date of most recent psychotic episode • Opinion of treating physician as to the appropriate reassessment interval
Rationale	<p>Given the nature of psychiatric disorders, assessment 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</p>

Chapter 15: Psychotropic Drugs and Driving

15.1 About drugs and driving

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 at least 10% of all people killed or injured in crashes were taking psychotropic medication, which might have been a contributory factor to the crash.

A 2011 study, *Drug use by fatally injured drivers in Canada (2000-2008)* by the Canadian Centre on Substance Abuse in Ottawa approximately 35% of people killed in accidents in Canada had drugs (includes legal and illicit drugs) in their system.

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 moderate to severe pain relief. Opioid drugs include the following:

- codeine
- fentanyl [Duragesic®]
- morphine [MS-Contin®, M-Eslon®]
- meperidine [Demerol®]
- methadone
- pentazocine [Talwin®]
- hydromorphone [Dilaudid®, Hydromorph Contin®]
- oxycodone [Percodan®, Percocet®, Endocet®, Supeudol®, Oxy Neo®], and
- hydrocodone [Hycodan®]

Antidepressants

Antidepressants are used in the treatment of major depression and a variety of other conditions such as chronic pain, anxiety, eating disorders, personality disorders 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®
	desipramine	Norpramin®
	clomipramine	Anafranil®
	doxepin	Sinequan®
Serotonin antagonist-reuptake inhibitor (SARIs)	trazadone	Desyrel®

Class	Generic Name	Brand Name
Selective serotonin-reuptake inhibitors (SSRIs)	fluoxetine	Prozac®
	fluvoxamine	Luvox®
	sertraline	Zoloft®
	citalopram	Celexa®
	paroxetine	Paxil®
Dual action agents (DAAs)	venlafaxine	Effexor®
Atypical Antidepressants	bupropion	Zyban®, Wellbutrin SR®
Monoamine oxidase inhibitors	phenelzine	Nardil®
	moclobemide	Various generics
	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 (methsuximide [Celontin®])
- hydantoin derivatives (phenytoin [Dilantin®])
- iminostilbene derivatives (carbamazepine [Tegretol®])
- benzodiazepines (clonazepam [Clonapam®])
- carboxylic acid derivatives (divalproex sodium [Epival®], valproic acid [Depakene®])
- various anticonvulsants (lamotrigine [Lamictal®], topiramate [Topamax®])
- 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:

- chlorpheniramine [Chlortripolon®]
- diphenhydramine [Benadryl®].

Examples of newer antihistamines include:

- loratadine [Claritin®]
- cetirizine [Reactine®]
- desloratadine [Aerius®], 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 1950s, and the “atypical” antipsychotics, introduced in the early 1990s and later.

Examples of typical antipsychotics include:

- haloperidol [Haldol®], and
- chlorpromazine [Largactil®]
- loxapine [Loxapac®]
- trifluoperazine [Stelazine®].

Examples of atypical antipsychotics include:

- clozapine [Clozaril®]
- risperidone [Risperdal®]
- olanzapine [Zyprexa®]
- aripiprazole [Abilify®]
- paliperidone [Invega®]
- quetiapine [Seroquel®], and
- ziprasidone [Zeldox®].

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:

- acetylsalicylic acid [Aspirin®, Entrophen®]
- diclofenac [Voltaren®]
- ibuprofen [Motrin®]
- naproxen [Anaprox®, Aleve®, Naprosyn®]
- celecoxib [Celebrex®], and
- indomethacin [Indocid®].

NSAIDs often are used in the treatment of mild to moderate pain, inflammation and fever 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.)
- menstrual pain.

Sedatives and hypnotics

Sedative and hypnotic drugs are central nervous system depressants. They are used to treat anxiety, insomnia, alcohol withdrawal, as muscle relaxants, and as anticonvulsants. The major categories are barbiturates, benzodiazepines and a new class of non- benzodiazepine sedatives called Z drugs.

Benzodiazepines can be divided into short acting, (those with a short half-life of 2 to 4 hours), which generally are used to treat insomnia, intermediate acting (those with half- life of 12-24 hours) and long-acting (those with a long half-life of >24 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	phenobarbital	Various generics
Benzodiazepines with a short half-life	triazolam	Halcion®
	alprazolam	Xanax®
	oxazepam	Serax®
Benzodiazepines with a medium half-life	lorazepam	Ativan®
	temazepam	Restoril®
	chloridazepoxide	Librium®
Benzodiazepines with a long half-life	clonazepam	Rivotril®
	diazepam	Valium®
	clorazepate	Tranxene®
	flurazepam	Dalmane®
Z drugs (non-benzodiazepines)	zopiclone	Imovane®
	zolpidem	Sublinox®

Stimulants (for ADHD, Narcolepsy)

Examples of stimulants used in the treatment of Attention-Deficit/Hyperactivity Disorder (ADHD) and Narcolepsy include:

- methylphenidate [Ritalin®, Concerta®, Biphentin®]
- modafinil [Alertec®]
- dextroamphetamine [Dexedrine®], and
- mixed amphetamine salts [Adderall®].

15.2 Prevalence

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 the 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% of 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

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.

15.3 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, time of day taken.

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. Many classes of drugs may be used to treat epilepsy as well as combinations of drugs. Driving outcomes would depend on which medications are used in the treatment.

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 limited studies however 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.

15.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
Use of psychotropic drugs	Persistent impairment: Functional assessment	Cognitive	Medical assessments Functional Assessment

Authorities should be 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. Where an individual is taking multiple drugs (polypharmacy), authorities must also consider the potential compounding effects. Where relevant, authorities should also consider the potential compounding effect of the use of alcohol or illicit drugs.

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
- sedation
- tremors
- muscle rigidity
- 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
- attention 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, nortriptyline [Aventyl®],
Moderate	imipramine [Tofranil®]
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 new DAAs, atypical antidepressants (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)
- poor concentration
- slowed thinking
- 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®], diphenhydramine [Benadryl®], and clemastine are associated with profound sedation, impaired psychomotor function and blurred vision.

Newer antihistamines, such as:

- loratadine [Claritin®]
- cetirizine [Reactine®]
- fexofenadine [Allegra®], and
- desloratadine [Aerius®]

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

Beta-blockers include:

- propranolol [Inderal®], and
- atenolol [Tenormin®]

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 dosages 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) and Narcolepsy

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 drivers with ADHD is unclear because of the methodological limitations of research to date.

15.5 Compensation

A driver can't compensate for the effects of psychotropic drug use.

15.6 Guidelines for assessment

15.6.1 Medication – Prescribed - All Drivers

This standard applies to prescribed medication including psychotropic drugs and prescribed medical marijuana

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • The functional abilities necessary for driving are not impaired and • Where required, a functional assessment shows that the side effects of medication does not affect ability to drive • Drivers on a formal methadone maintenance program must provide an addictions specialist report, in addition to meeting the above requirements
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report; or ○ additional information from the treating physician • If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may 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
Conditions for maintaining licence	None
Reassessment	<p>No re-assessment, other than routine commercial or age-related re-assessment is required, unless</p> <ul style="list-style-type: none"> • the re-assessment guidelines for the underlying condition require re-assessment • the treating physician indicates non-compliance or misuse of psychotropic drugs and/or • the treating physician or cognitive screening indicates possible persistent cognitive or any functional impairment
Information from health care providers	<ul style="list-style-type: none"> • Types of psychotropic drugs used • Details of underlying medical conditions • Opinion of treating physician whether the individual is non-compliant or misuses psychotropic drugs • Functional impairment, if any
Rationale	<p>The use of a psychotropic drug does not mean that a driver is ineligible for a licence. 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 licence eligibility.</p>

15.6.2 Medication – Non Prescribed (Over the Counter) – All drivers

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • The functional abilities necessary for driving are not impaired and, • Where required, a functional assessment shows that the side effects of medication does not affect ability to drive
BC Guidelines	<ul style="list-style-type: none"> • RoadSafetyBC will not generally request further information • If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report; or ○ additional information from the treating physician • If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may request <ul style="list-style-type: none"> ○ 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
Conditions for maintaining licence	None
Reassessment	<p>No re-assessment, other than routine commercial or age-related re-assessment is required, unless</p> <ul style="list-style-type: none"> • the re-assessment guidelines for the underlying condition require re-assessment • the treating physician indicates non-compliance or misuse of over-the-counter drugs and/or • the treating physician or cognitive screening indicates possible persistent cognitive or any functional impairment
Information from health care providers	<ul style="list-style-type: none"> • Types of drugs used • Details of underlying medical conditions • Opinion of treating physician whether the individual is non-compliant or misuses drugs • Functional impairment, if any
Rationale	<p>The use of a psychotropic drug does not mean that a driver is ineligible for a licence. 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 licence eligibility.</p>

15.6.3 Substance Abuse or Dependence - All drivers

This applies to all drivers who are under the influence of **alcohol** and **illicit drugs** such as opioids, cocaine, amphetamines etc.

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Meets the criteria for remission and/or has abstained from the substance for 12 months • Earlier re-licencing may be considered upon favourable recommendation from an addictions specialist and/or treating physician recognized by the licensing authority and the successful completion of a drug rehabilitation program. • The functional abilities necessary for driving are not impaired • Where required, a road test or other functional assessment shows that the functional abilities for driving are not impaired
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may request: <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report or additional information from a physician who is familiar with client's past medical history or has access to client's past clinical /medical records; or ○ an assessment from a registered psychologist or an addictions specialist • RoadSafetyBC may find individuals with medically documented problematic drug and/or alcohol misuse fit to drive if they meet above standard. • Otherwise, RoadSafetyBC may find individuals fit to drive if: <ul style="list-style-type: none"> ○ the treating physician who is familiar with client's past medical history or has access to client's past clinical /medical records states that the patient does not have ongoing and significant issues with drugs and/or alcohol, therefore the required standard for remission and/or abstinence from the substance for 12 months does not apply; OR ○ the physician has no concern for the individual's safety; and /or ○ the physician indicates that the individual is able to separate their drug and/or alcohol use from the task of driving; and/or ○ the physician indicates the individual has no drug or alcohol related pathology that may interfere with the functions necessary for driving; and ○ RoadSafetyBC has no collateral information that indicates the individual is driving while under the influence. • Once the preceding requirements have been met, if the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may request <ul style="list-style-type: none"> ○ 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

Conditions for maintaining licence	None
Reassessment	<p>No re-assessment, other than routine commercial or age-related re-assessment is required, unless</p> <ul style="list-style-type: none"> • the re-assessment guidelines for the underlying condition require re-assessment • the treating physician indicates non-compliance with prescribed treatment and/or • the treating physician or cognitive screening indicates possible persistent cognitive or any functional impairment
Information from health care providers	<ul style="list-style-type: none"> • Types of substance used • Details of underlying medical conditions • Opinion from an addictions specialist and/or treating physician recognized by the licensing authority • Details about any planned or completed rehabilitation program • Report on whether the individual is abstinent/ and or in remission
Rationale	These substances are known to potentially impair the ability to operate a motor vehicle safely

15.6.4 Alcohol and Driving – All drivers

National Standard	Impaired individuals are not permitted to drive any class of motor vehicle
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report; or ○ additional information from the treating physician ○ see <u>15.6.3</u> • In BC, under section <u>25.1</u> and <u>25.2</u> of the MVA, drivers may be referred to provincial remedial programs if the individual has a driving record that shows a history of drinking and/or drug use and driving. These processes are managed outside of the Driver Medical Fitness Program
Conditions for maintaining licence	None

Reassessment	<p>No re-assessment, other than routine commercial or age-related re-assessment is required, unless</p> <ul style="list-style-type: none"> • the re-assessment guidelines for the underlying condition require re-assessment • the treating physician indicates non-compliance with prescribed treatment and/or • the treating physician or cognitive screening indicates possible persistent cognitive or any functional impairment
Information from health care providers	<ul style="list-style-type: none"> • Details of underlying medical conditions • If individual has a substance abuse disorder; the requirements of <u>15.6.3</u> apply
Rationale	Alcohol is known to impair the ability to operate a motor vehicle safely

Chapter 16: Respiratory diseases

16.1 About respiratory diseases

Overview

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 standards 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 ¹⁷ 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

¹⁷ 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 Testing¹⁷ 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

16.2 Prevalence

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%).

16.3 Respiratory diseases and adverse driving outcomes

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

16.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach ¹⁸	Primary functional ability affected	Assessment tools
COPD or other respiratory disease	Persistent impairment: Functional assessment	Cognitive May also result in general debility	Medical assessments Functional Assessment

Research indicates that drivers 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 a driver's functional ability to drive.

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

Older drivers 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.

16.5 Compensation

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

¹⁸ See Part 1 for a discussion of the use of functional assessments for driver licensing decisions

16.6 Guideline for assessment

16.6.1 Mild impairment

National Standard	All drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment
Information from health care providers	Pulmonary function testing result <u>or</u> statement that the level of impairment resulting from the respiratory disease is mild
Rationale	Mild impairment due to respiratory disease is unlikely to cause significant impairment of the functions needed for driving

16.6.2 Moderate impairment – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess every 5 years, or as recommended by the treating physician, unless routine age-related re-assessment applies
Information from health care providers	Pulmonary function testing result or statement that the level of impairment resulting from the respiratory disease is moderate
Rationale	Moderate impairment due to respiratory disease is unlikely to cause significant impairment of the functions needed for non-commercial driving. Reassessment is required to monitor for an increase in impairment that may affect ability to drive

16.6.3 Severe impairment – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • a functional assessment indicates sufficient functional ability
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report; or ○ additional information from the treating physician • If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may request <ul style="list-style-type: none"> ○ 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 • If an ICBC driver examiner recommends further assessment, RoadSafetyBC may request <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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will typically re-assess every 2 years or as recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Results of functional assessment • Pulmonary function testing result or statement that the level of impairment resulting from the respiratory disease is severe • Whether the driver has insight into the impact their condition may have on driving
Rationale	Severe impairment due to respiratory disease may cause significant impairment of the functions needed for driving, including cognitive impairment. Licensing decisions should be based on an individual functional assessment.

16.6.4 Requiring supplemental oxygen – Non-commercial drivers

This guideline applies to non-commercial drivers who require supplemental oxygen while at rest.

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • a road test while using supplemental oxygen indicates sufficient functional ability, and • the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report; or ○ additional information from the treating physician • RoadSafetyBC may 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 • If an ICBC driver examiner recommends further assessment, RoadSafetyBC may request <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
Conditions for maintaining licence	No conditions are required
Restrictions	<p>RoadSafetyBC will impose the following restriction on the licence of an individual who is found fit to drive</p> <ul style="list-style-type: none"> • 51 May drive only when using supplemental oxygen
Reassessment	RoadSafetyBC will typically re-assess every 2 years or as recommended by the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Pulmonary function testing result or statement that the level of impairment resulting from the respiratory disease requires supplemental oxygen • Whether the driver has insight into the impact their condition may have on driving • History of compliance with prescribed treatment regime • If known or applicable, whether the driver is compliant with any current conditions of licence
Rationale	<p>Drivers who require supplemental oxygen due to respiratory disease may have significant impairment of the functions needed for non-commercial driving, including cognitive impairment. Licensing decisions should be based on an individual functional assessment, including ability to drive while using supplemental oxygen</p>

16.6.5 Moderate impairment – Commercial drivers

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none"> • a functional assessment indicates sufficient functional ability
BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report, or ○ additional information from the treating physician • RoadSafetyBC may 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 • If an ICBC driver examiner recommends further assessment, RoadSafetyBC may request <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
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in accordance with the schedule for routine commercial re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Functional impairment, if any • Pulmonary function testing result or statement that the level of impairment is moderate • Whether the driver has insight into the impact their condition may have on driving • History of compliance with prescribed treatment regime
Rationale	Moderate impairment due to respiratory disease may cause significant impairment of the functions needed for driving. Licensing decisions should be based on an individual functional assessment

16.6.6 Severe impairment or requiring supplemental oxygen – Commercial drivers

This guideline applies to commercial drivers who require supplemental oxygen while at rest.

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	Severe impairment or a requirement for supplemental oxygen due to respiratory disease generally indicates significant impairment of the functions needed for commercial driving

Chapter 17: Seizures and epilepsy

17.1 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 (antiepileptics) 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 antiepileptic

drugs. Many of those who achieve seizure control are eventually able to stop taking antiepileptic 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 antiepileptics on driving, see [Chapter 15, Psychotropic Drugs](#).

17.2 Prevalence

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.¹⁹

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

17.3 Seizures, 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 antiepileptic drug treatment are at greater risk than those receiving treatment.

¹⁹ 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).

17.4 Effect on functional ability to drive

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	Medical assessments

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.

17.5 Compensation

As seizures and epilepsy cause an episodic impairment of the functions necessary for driving, a driver cannot compensate.

17.6 Guideline for assessment

Rationale for all epilepsy and seizure standards

The general approach of the guideline 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 driver's ability to drive safely.

The guidelines identify exceptions to the requirement to remain seizure free for non-commercial drivers who have epilepsy and who have only simple partial seizures, or seizures that only occur while they are asleep or immediately upon awakening.

17.6.1 Provoked seizures caused by a structural brain abnormality

This standard applies to drivers who have experienced provoked seizures caused by a structural brain abnormality such as:

- a brain tumour
- stroke
- subdural hematoma, or
- aneurysm.

National Standard	<p>All drivers eligible for a licence 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 was corrected, with or without treatment, and they have not had a seizure during that time • the treating neurologist or neurosurgeon indicates that further seizures are unlikely
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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, RoadSafetyBC may request an assessment from a neurologist
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • If the seizure occurred within the past 12 months, RoadSafetyBC will re-assess in one year • If no further seizures are reported at that time, or if the seizure occurred more than one year ago, RoadSafetyBC will re-assess in five years • If no further seizures are reported at that time, no further re-assessment, other than routine commercial or age-related re-assessment, is required
Information from health care providers	<ul style="list-style-type: none"> • Date of the last seizure • Description of the type of seizure • Whether a neurological assessment has been conducted and the results of the assessment • Date that the provoking factor stabilized, resolved or was corrected • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime • Opinion of treating physician on whether further seizures are likely. Depending on the nature of the provoking factor, the opinion of a neurologist may be required to determine the risk of further seizures

Rationale	The primary consideration for drivers who experience seizures is the potential for a seizure causing a sudden impairment of cognitive, motor or sensory functions, or a loss of consciousness while driving. The purpose of a seizure-free period. requirement for a provoked seizure is to establish the likelihood that the provoking factor has been successfully treated or stabilized
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17.6.2 Provoked seizures with no structural brain abnormality

This standard applies to drivers who have experienced provoked seizures caused by a:

- toxic illness
- adverse drug reaction
- trauma, or other cause that is not associated with a structural brain abnormality.

National Standard	<p>All drivers eligible for a licence 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
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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, RoadSafetyBC may request an assessment from a neurologist
Conditions for maintaining licence	None
Reassessment	No re-assessment, other than routine commercial or age-related re-assessment, is required.
Information from health care providers	<ul style="list-style-type: none"> • Description of the type of seizure • Whether a neurological assessment has been conducted and the results of the assessment • Opinion of treating physician on whether the provoking factor has stabilized, resolved or been corrected • Opinion of treating physician on whether further seizures are likely. Depending on the nature of the provoking factor, the opinion of a neurologist may be required to determine the risk of further seizures

Rationale	The primary consideration for drivers who experience seizures is the potential for a seizure causing a sudden impairment of cognitive, motor or sensory functions, or a loss of consciousness while driving. The general approach of the guidelines for drivers who experience seizures is that seizures must be controlled as a prerequisite to driving and/or the provoking factor has stabilized, resolved, or has been corrected
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17.6.3 Alcohol-related provoked seizures

National Standard	<p>All drivers eligible for a licence if</p> <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, there is no diagnosis of alcohol abuse/dependency it has been at least 6 months since they have used alcohol and have not had a seizure earlier re-licencing may be considered upon favourable recommendation from an addiction specialist and/or treating physician recognized by the licencing authority, and the conditions for maintaining a licence are met
BC Guidelines	If further information is required, RoadSafetyBC may request an assessment from a registered psychologist or an addictions specialist or a physician who is familiar with client's past medical history or has access to client's past clinical /medical records
Conditions for maintaining licence	<p>RoadSafetyBC will impose the following conditions on an individual who is found fit to drive</p> <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 RoadSafetyBC and your physician if you have a seizure
Reassessment	<ul style="list-style-type: none"> RoadSafetyBC will re-assess in one year If no further seizures are reported at that time, RoadSafetyBC will re-assess in five years If no further seizures are reported at that time, no further re-assessment, other than routine commercial or age-related re-assessment, is required

Information from health care providers	<ul style="list-style-type: none"> • Description of the cause of the seizure • Date of the last seizure • Details of treatment regime • Date of abstinence • Whether the driver has undergone addiction treatment • Report from an addiction counsellor and / or treating physician whether the driver is compliant
Rationale	The primary consideration for drivers who experience seizures is the potential for a seizure causing a sudden impairment of cognitive, motor or sensory functions, or a loss of consciousness while driving. The purpose of a seizure-free period. requirement for a provoked seizure is to establish the likelihood that the provoking factor has been successfully treated or stabilized

17.6.4 Single unprovoked seizure – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • Complete neurological assessment has been conducted to determine the cause of the seizure, and epilepsy is not diagnosed, and • CNS imaging and EEG results are satisfactory
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may request <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, RoadSafetyBC may request an assessment from a neurologist • RoadSafetyBC may find individuals fit to drive if: <ul style="list-style-type: none"> ○ if they meet standard above ; and ○ it has been at least 3 months since the seizure occurred
Conditions for maintaining licence	None

Reassessment	<ul style="list-style-type: none"> • If the seizure occurred within the past 12 months, RoadSafetyBC will re- assess in one year • If no further seizures are reported at that time, or if the seizure did not occur within the past 12 months, RoadSafetyBC will re- assess in five years • If no further seizures are reported at that time, no further re-assessment, other than routine age-related re-assessment, is required
Information from health care providers	<ul style="list-style-type: none"> • Date of the seizure • Description of the type of seizure • Whether a neurological assessment has been conducted and the results of the assessment
Rationale	The primary consideration for drivers who experience seizures is the potential for a seizure causing a sudden impairment of cognitive, motor or sensory functions, or a loss of consciousness while driving. The purpose of a seizure-free period requirement for an unprovoked seizure is to allow time to assess the cause and establish seizures are controlled as a prerequisite to driving

17.6.5 Single unprovoked seizure – Commercial drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been at least 12 months since the seizure occurred, and • Complete neurological assessment has been conducted to determine the cause of the seizure, and epilepsy is not diagnosed, and • CNS imaging and EEG results are satisfactory
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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, RoadSafetyBC may request an assessment from a neurologist
Conditions for maintaining licence	None
Reassessment	RoadSafetyBC will re-assess in one year. If no further seizures are reported at that time, RoadSafetyBC will re-assess in accordance with routine commercial re-assessment

Information from health care providers	<ul style="list-style-type: none"> • Date of the seizure • Description of the type of seizure • Whether a neurological assessment has been conducted and the results of the assessment
Rationale	The primary consideration for drivers who experience seizures is the potential for a seizure causing a sudden impairment of cognitive, motor or sensory functions, or a loss of consciousness while driving. The purpose of a seizure-free period requirement for an unprovoked seizure is to allow time to assess the cause and establish seizures are controlled as a prerequisite to driving

17.6.6 Epilepsy – Non-commercial drivers

This standard applies to non-commercial drivers who have been diagnosed with epilepsy, with the following exceptions:

- If the epileptic seizures only occur while the driver is asleep, or immediately after awakening, standard [17.6.7](#) applies.
- If the driver only experiences simple partial seizures, standard [17.6.8](#) applies.
- If the driver has had surgery for epilepsy, standard [17.6.9](#) applies.
- If the driver has changed effective medication, standard [17.6.10](#) applies.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • It has been 6 months since the seizure occurred with or without medication
BC Guidelines	If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	RoadSafetyBC 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 RoadSafetyBC and your physician if you have a seizure
Reassessment	<ul style="list-style-type: none"> • If a seizure occurred within the past 12 months, RoadSafetyBC will re-assess 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 re-assessment, other than routine age-related re-assessment, is required

Information from health care providers	<ul style="list-style-type: none"> • Date of the last seizure • Details of the driver's treatment regime, including length of time the driver has been on antiepileptic medication • Opinion of treating physician on whether the driver is compliant with their treatment regime
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. The purpose of a seizure-free period requirement where epilepsy is diagnosed is 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

17.6.7 Epilepsy with seizures only while asleep or upon awakening – Non-commercial drivers

National Standard	<p>Non-commercial driver eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 6 months since the last seizure OR, • the driver is experiencing seizures but seizure pattern has been consistent for at least 1 year- and therefore no seizure free waiting period required • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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.
Conditions for maintaining licence	<p>RoadSafetyBC 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 • you must routinely follow your physician's advice regarding continued monitoring of your seizures • you must report to RoadSafetyBC and your physician if the pattern of your seizures changes
Reassessment	No re-assessment, other than routine age-related re-assessment, is required

Information from health care providers	<ul style="list-style-type: none"> • Description of the seizure pattern • Whether the seizure pattern has been consistent for at least 1 years • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime
Rationale	The purpose of a seizure-free period requirement for drivers with epilepsy with seizures only while asleep or upon awakening is to establish seizures are controlled or seizure pattern has been consistent for a prescribed time as a prerequisite to driving

17.6.8 Epilepsy with simple partial seizures – Non-commercial drivers

This standard applies to non-commercial 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.

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 6 months since the last seizure OR, • the driver is experiencing seizures but the seizure pattern has been consistent for at least 1 year- and therefore no seizure free waiting period required • favourable assessment from the treating physician or neurologist • no impairment in level of consciousness or cognition • no head or eye deviation with seizures • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	<p>RoadSafetyBC 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 • you must report to RoadSafetyBC and your physician if the symptoms of your seizures change
Reassessment	No re-assessment is required, other than routine age-related re-assessment

Information from health care providers	<ul style="list-style-type: none"> • Date of last seizure • Description of the symptoms of the seizures • Whether the symptoms of the seizures have been consistent for at least 1 year • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime
Rationale	The purpose of a seizure-free period requirement for drivers with epilepsy with simple partial seizures is to establish seizures are controlled or seizure pattern has been consistent for a prescribed time as a prerequisite to driving

17.6.9 Surgery for epilepsy – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • they have not had a seizure for 6 months after surgery • the conditions for maintaining a licence are met
BC Guidelines	If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	RoadSafetyBC 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 RoadSafetyBC and your physician if you have a seizure
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in five years. • If no seizures are reported at that time, no further re-assessment, other than routine age-related re-assessment, is required
Information from health care providers	<ul style="list-style-type: none"> • Date of the last seizure • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime

Rationale	The purpose of a seizure-free period. requirement for drivers with epilepsy who had a surgery is to establish seizures are controlled as a prerequisite to driving
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17.6.10 Epilepsy with medication change – Non-commercial drivers

This standard applies to non-commercial drivers with epilepsy who undergo a prescribed change to, or withdrawal of, an effective antiepileptic medication. This standard only applies where the driver'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 guideline 17.6.6 applies.

National Standard	<ul style="list-style-type: none"> • Non-commercial drivers eligible for a licence 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, and ○ the conditions for maintaining a licence are met • Non-commercial drivers who have a seizure after a change to, or withdrawal from, antiepileptic medication eligible for a licence if <ul style="list-style-type: none"> ○ they re-establish a previously effective treatment regime ○ the treating physician indicates that further seizures are unlikely, ○ it has been 3 months since the previously effective treatment regime was resumed and they have not had a seizure during that time ○ the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	<ul style="list-style-type: none"> • Routinely follow treatment regime and physician's advice regarding prevention of seizures • Cease driving and report to the authority and your physician if you have a seizure

Reassessment	<ul style="list-style-type: none"> • If a seizure occurred within the past 12 months, RoadSafetyBC will re-assess in one year • If no further seizures are reported at that time, or if a seizure did not occur within the past 12 months, RoadSafetyBC will re-assess in five years • If no further seizures are reported at that time, no further re-assessment, other than routine age-related re-assessment, is required
Information from health care providers	<ul style="list-style-type: none"> • Date of the medication change or withdrawal • Date of the last seizure • Details of the driver's treatment regime • Opinion of treating physician whether the driver is compliant with their treatment regime • Opinion of treating physician whether further seizures are likely
Rationale	The general approach of the guidelines for drivers with epilepsy or with medication change for epilepsy, or who experience seizures is that seizures must be controlled as a prerequisite to driving

17.6.11 Epilepsy – Commercial drivers

This standard applies to commercial drivers, who have been diagnosed with epilepsy, except:

- whose seizures only occur while they are asleep or immediately after awakening, and ([17.6.12](#))
- who have only simple partial seizures (no impairment in level of consciousness), the symptoms of which do not impair their functional ability to drive ([17.6.13](#)).

See guideline [17.6.14](#) for commercial drivers who meet this standard and then change medication.

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • they have not had a seizure with or without medication for 5 years, and • the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC may 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 • RoadSafetyBC will apply above standard to commercial drivers who have had surgery for epilepsy

Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have a seizure
Restrictions	<p>RoadSafetyBC will place the following restriction on an individual's licence who meet the medical standard for commercial drivers with epilepsy</p> <ul style="list-style-type: none"> • R 22 (Code W) Class 1-4 Invalid in USA
Reassessment	<p>RoadSafetyBC will re-assess in accordance with the schedule for routine commercial re-assessment</p>
Information from health care providers	<ul style="list-style-type: none"> • Date of the last seizure • Details of the driver's treatment regime, including length of time the driver has been on or off antiepileptic medication • Opinion of treating physician on whether the driver is compliant with their treatment regime
Rationale	<p>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. The purpose of a seizure-free period requirement where epilepsy is diagnosed is 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</p>

17.6.12 Epilepsy with seizures only while asleep or upon awakening -Commercial Drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • the driver is experiencing seizures but the seizure pattern has been consistent for at least 5 years • no prolonged postictal impairment in wakefulness
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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

Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if the pattern of seizures changes
Restrictions	<p>RoadSafetyBC will place the following restriction on an individual's licence who meet the medical standard for commercial drivers with epilepsy</p> <ul style="list-style-type: none"> • R 22 (Code W) Class 1-4 Invalid in USA
Reassessment	<p>RoadSafetyBC will re-assess in accordance with the schedule for routine commercial re-assessment</p>
Information from health care providers	<ul style="list-style-type: none"> • Description of the seizure pattern • Whether the seizure pattern has been consistent for at least 5 years • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime
Rationale	<p>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. The general approach of the guidelines for drivers with epilepsy who experience seizures while asleep or upon awakening is to establish seizures are controlled or seizure pattern has been consistent for a prescribed time as a prerequisite to driving</p>

17.6.13 Epilepsy with simple partial seizures - Commercial Drivers

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 5 years since the last seizure OR, • the driver is experiencing seizures but the seizure pattern has been consistent for 3 years – and therefore no seizure free waiting period required • favourable assessment from neurologist to drive • no impairment in level of consciousness or cognition • no head or eye deviation with seizures • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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

Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if the symptoms of seizures changes
Restrictions	<p>RoadSafetyBC will place the following restriction on an individual's licence who meet the medical standard for commercial drivers with epilepsy</p> <ul style="list-style-type: none"> • R 22 (Code W) Class 1-4 Invalid in USA
Reassessment	<p>RoadSafetyBC will re-assess in accordance with the schedule for routine commercial re-assessment</p>
Information from health care providers	<ul style="list-style-type: none"> • Description of the symptoms of the seizures • Whether the symptoms of the seizures have been consistent for at least 3 years • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime
Rationale	<p>The purpose of a seizure-free period requirement for drivers with epilepsy with simple partial seizures is to establish seizures are controlled or seizure pattern has been consistent for a prescribed time as a prerequisite to driving</p>

17.6.14 Epilepsy with medication change - Commercial drivers

This standard applies to commercial drivers with epilepsy who undergo a prescribed change to, or withdrawal of, an effective antiepileptic medication. This standard only applies where the driver'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 guideline 17.6.11 before this standard will apply.**

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been 6 months since the prescribed change or withdrawal and they have not had a seizure during that time, and • the conditions for maintaining a licence are met • Commercial drivers who have a seizure after a prescribed change to, or withdrawal from antiepileptic medication are eligible for a licence if: <ul style="list-style-type: none"> • it has been 6 months since the prescribed change or withdrawal and they have not had a seizure during that time • they have re-established a previously effective treatment regime • the treating physician indicates that further seizures are unlikely, and • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may 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
Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have a seizure
Restrictions	<p>RoadSafetyBC will place the following restriction on an individual's licence who meet the medical standard for commercial drivers with epilepsy</p> <ul style="list-style-type: none"> • R 22 (Code W) Class 1-4 Invalid in USA
Reassessment	<p>RoadSafetyBC will re-assess in accordance with the schedule for routine commercial re-assessment</p>
Information from health care providers	<ul style="list-style-type: none"> • Date of the medication change or withdrawal • Date of the last seizure • Details of the driver's treatment regime • Opinion of treating physician on whether the driver is compliant with their treatment regime • Opinion of treating physician on whether further seizures are likely
Rationale	<p>The purpose of a seizure-free period. requirement for drivers with epilepsy with medication change is to establish seizures are controlled as a prerequisite to driving</p>

Chapter 18: Sleep disorders

18.1 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 forms 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. In the medical standards in this section, obstructive sleep apnea-hypopnea syndrome is referred to as OSA.
- 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, respiratory muscle weakness or obstructive lung disease such as COPD.

Obstructive sleep apnea-hypopnea syndrome (OSA)

With OSA, 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 OSA 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 OSA 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 OSA. 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 OSA. 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 OSA, 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 OSA.

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 or engaging in conversation.

Treatment options for OSA 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 (usually within 2 weeks) 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. Medical

consensus supports the resumption of driving after 2 weeks of treatment. Estimates of compliance with CPAP treatment vary depending on how it is 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.

All commercial drivers must file periodic mandatory medical reports to assess their fitness to hold a commercial licence. Non-commercial drivers are assessed for fitness to drive on a case by case basis, taking into account the treating physicians specific recommendations.

OSA Indicators

During periodic medical assessments it is essential the examining physician screen for sleep disorders risk factors. The FMCSA Expert Panel Recommendations on Obstructive Sleep Apnea and Commercial Motor Vehicle Driver Safety (2008) reflected the following on OSA.

Symptoms suggestive of OSA:

- Chronic loud snoring
- Witnessed apneas or breathing pauses during sleep
- Daytime sleepiness

Risk factors for OSA:

- Male
- Advancing age
- BMI > 28 kg/m² (BMI - Body Mass Index)
- Small jaw
- Large neck size (≥ 17 inches male, ≥ 15.5 inches female)
- Small airway
- Family

OSA Conditions associated with OSA:

- HBP (High Blood Pressure) or HTA (Hypertension Arterial)
- Type 2 diabetes
- Hypothyroidism

OSA Assessment

Patients with severe OSA, who have been involved in a crash in which their medical condition was a causal factor, are at high risk of having more accidents if they are not treated successfully. Even without having experienced a crash, severe sleep apnea has been identified as a factor that increases crash risk. Consequently, commercial drivers who have experienced a crash associated with falling asleep, or

report they have experienced excessive sleepiness while driving, should be advised to stop driving immediately pending completion of sleep studies and effective treatment.

Furthermore, licensing agencies must decide if commercial drivers with OSA risk factors associated with the symptoms listed are fit to hold class 1, 2, 3 or 4 driver licences pending a sleep expert assessment given current waiting times for sleep studies.

Treated OSA is subject to annual medical review by the licensing agency for all Class 1, 2, 3 and 4 driver licence holders.

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 (Alartec™)
- tricyclic antidepressants
- selective serotonin reuptake inhibitors

- venlafaxine (EffexorTM), or
- reboxetine (EdronaxTM).

See [Chapter 15](#), Psychotropic Drugs, for more information about medications and driving.

18.2 Prevalence

OSA affects 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.

18.3 Sleep disorders and adverse driving outcomes

Numerous studies have investigated the relationship between OSA and adverse driving outcomes. OSA may cause daytime drowsiness and reduced concentration that are symptoms that can negatively affect driving safely. OSA is also of special concern for the commercial driver who often drives long distances with few breaks and whose work schedule may not be conducive to healthy sleep hygiene.

The majority of studies indicate that individuals with OSA 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 OSA, there are few studies on narcolepsy and adverse driving outcomes. Although limited, this research suggests that narcolepsy is also associated with elevated crash rates.

18.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment	Primary functional ability affected	Assessment tools
OSA Narcolepsy	Episodic impairment: Medical assessment – likelihood of impairment	All – sudden incapacitation Cognitive – reduced alertness	Medical assessments
	Persistent impairment: Functional assessment	Cognitive	Medical assessments Functional assessments

18.5 Compensation

Drivers 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 licensing decisions.

18.6 Guideline for assessment

18.6.1 OSA – All drivers

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • has untreated obstructive sleep apnea with an AHI < 20, and has no daytime sleepiness or, • has obstructive sleep apnea that is treated successfully • may not operate any class of vehicle if has experienced a crash associated with falling asleep or reports excessive sleepiness while driving until the sleep disorder has been treated successfully • the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report ○ additional information from the treating physician, or a copy of the sleep study report, or an assessment from a respirologist • RoadSafetyBC may find individuals fit to drive if they meet standard above
Conditions for maintaining licence	<p>RoadSafetyBC will impose the following condition</p> <ul style="list-style-type: none"> • Cease driving and report any episodes of sleep at the wheel to the treating physician and the authority
Reassessment	<p>The following exceptions to CMMTA reassessment standards apply</p> <ul style="list-style-type: none"> • RoadSafetyBC will re-assess drivers in accordance with routine commercial or age-related re-assessment, unless a shorter re-assessment interval is recommended by the treating physician or information of file indicates earlier follow up is indicated
Information from health care providers	<ul style="list-style-type: none"> • Confirmation whether condition is treated or untreated <ul style="list-style-type: none"> ○ If untreated: an assessment from a sleep specialist or respirologist confirming that AHI is < 20 ○ If treated: confirmation that treatment is successful • History of sleep at the wheel within the past five years • Opinion of treating physician whether the driver understands the nature of the condition and the potential impact on driving

Rationale	<p>The primary concerns with OSA are daytime sleepiness (risk of sleep while driving) and persistent cognitive impairment.</p> <p>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 standard looks to driver history of sleep at the wheel for identifying current risk of sleep while driving. The standard also emphasizes the responsibility of the driver to be attentive to the risk for daytime sleepiness</p>
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18.6.2 Narcolepsy – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • there have been no daytime sleep attacks, with or without treatment, during the past 12 months • there have been no episodes of cataplexy, with or without treatment, during the past 12 months
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may 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 sleep specialist
Conditions for maintaining licence	None
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess annually • If no episodes or attacks are reported, RoadSafetyBC may assess less frequently upon the recommendation of the treating physician
Information from health care providers	<ul style="list-style-type: none"> • Type of treatment • Whether there have been daytime sleep attacks within the past 12 months • Whether there have been episodes of cataplexy within the past 12 months

Rationale	<p>The general approach of the standard for drivers with narcolepsy is that attacks must be controlled as a prerequisite to driving. Where a driver is treated, the standard includes 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 driver'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>
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18.6.3 Narcolepsy – Commercial drivers

National Standard	Commercial drivers not eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	N/A
Reassessment	N/A
Information from health care providers	N/A
Rationale	Consensus medical opinion in Canada indicates that the risks from the increased driving exposure associated with commercial driving are such that drivers with narcolepsy may not drive

Chapter 19: Syncope

19.1 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.

19.2 Prevalence

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 lives. Higher rates of syncope are reported in older individuals.

19.3 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.

19.4 Effect on functional ability to drive

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	Medical assessments

Syncope causes an episodic impairment of all the functions necessary for driving.

19.5 Compensation

As syncope causes an episodic impairment of the functions necessary for driving, compensation does not apply.

19.6 Guideline for Assessment

The following table lists the standards applicable to various types of syncope.

Type of syncope		Standards for non-commercial drivers	Standards for commercial drivers
Single (one episode within a 12 month period)	Typical vasovagal - 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.	<u>19.6.1</u>	<u>19.6.8</u>
	Unexplained	<u>19.6.2</u>	<u>19.6.10</u>
	Atypical vasovagal - 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.	<u>19.6.2</u>	<u>19.6.10</u>
Recurrent (two or more episodes within a 12 month period)	Reversible cause	<u>19.6.3</u>	<u>19.6.3</u>
	Diagnosed and treated cause (e.g. pacemaker for bradycardia)	<u>19.6.4</u>	<u>19.6.9</u>
	Typical vasovagal (see definition above)	<u>19.6.5</u>	<u>19.6.10</u>
	Situational with an avoidable trigger (e.g. micturition syncope, defecation syncope)	<u>19.6.6</u>	<u>19.6.6</u>
	Unexplained	<u>19.6.7</u>	<u>19.6.10</u>
	Atypical vasovagal (see definition above)	<u>19.6.7</u>	<u>19.6.10</u>

The following table summarizes the syncope standards and waiting periods

STANDARD	Non Commercial Driver Class 5-8	Commercial Driver Class 1-4
Single episode of typical vasovagal syncope*	No restriction	
Diagnosed and treated cause e.g. permanent pacemaker for bradycardia	1 week	1 month
Reversible cause e.g. hemorrhage, dehydration	Successful treatment of underlying condition	
Situational syncope with avoidable trigger e.g. micturition syncope, defecation syncope	1 week	
- Single episode of unexplained syncope - Recurrent (within 12 months) vasovagal syncope	1 week	12 months
Recurrent episode of unexplained syncope (within 12 months)	3 months	12 months
Syncope due to documented tachyarrhythmia, or inducible tachyarrhythmia at EPS	Refer to Cardiac Section on Syncope	

* No restriction is recommended unless the syncope occurs in the sitting position or if it is determined that there may be an insufficient prodrome to pilot the vehicle to the roadside to a stop before losing consciousness. If vasovagal syncope is atypical, the restrictions for “unexplained” syncope apply. **EPS:** *Electrophysiology study*

Rationale for all syncope standards

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 standards, 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.

19.6.1 Single episode of typical vasovagal syncope – Non-commercial drivers

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.

National Standard	Non-commercial drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	No re-assessment is required after an episode of typical vasovagal syncope
Information from health care providers	Description of the type of syncope
Rationale	CCS recommendation

19.6.2 Single episode of unexplained syncope or atypical vasovagal syncope – Non-commercial drivers

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.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none">• it has been at least 1 week since the last episode of syncope, and• the conditions for maintaining a licence are met
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	Report to the authority and your physician if you have another episode of syncope
Reassessment	<ul style="list-style-type: none">• If an episode of unexplained syncope or atypical vasovagal syncope occurred within the past 12 months, RoadSafetyBC will re-assess in one year• If no further episodes are reported at that time, no further re-assessment, other than routine age-related re-assessment is required

Information from health care providers	<ul style="list-style-type: none"> • Description of the type of syncope • Date of the last episode of syncope
Rationale	CCS recommendation. 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

19.6.3 Syncope with a reversible cause

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • the cause has been successfully treated, and • the conditions for maintaining a licence are met
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have another episode of syncope
Reassessment	No re-assessment, other than routine age-related re-assessment or routine commercial re-assessment is required, unless re-assessment is required because of the underlying medical condition or treatment
Information from health care providers	<ul style="list-style-type: none"> • Description of the cause of the syncope • Opinion of the treating physician whether the treatment was successful
Rationale	CCS recommendation

19.6.4 Syncope with a diagnosed and treated cause – Non-commercial drivers

Syncope with a diagnosed and treated cause (e.g., pacemaker for bradycardia)

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been at least one week since successful treatment, and • the conditions for maintaining a licence are met
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BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	RoadSafetyBC will impose the following condition on an individual who is found fit to drive <ul style="list-style-type: none"> • you must report to RoadSafetyBC and your physician if you have another episode of syncope
Reassessment	No re-assessment, other than routine age-related re-assessment is required, unless re-assessment is required because of the underlying medical condition or treatment
Information from health care providers	<ul style="list-style-type: none"> • Description of the cause of the syncope • Date of treatment • Opinion of the treating physician whether the treatment was successful
Rationale	CCS recommendation

19.6.5 Recurrent typical vasovagal syncope – Non-commercial drivers

This guideline applies to non-commercial drivers who have had two or more episodes of typical vasovagal syncope within a 12 month period.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been at least one week since the last episode of syncope
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	No conditions are required
Reassessment	For individuals with recurrent typical vasovagal syncope, RoadSafetyBC will re-assess in one year. If no further episodes of syncope are reported at that time, no further re-assessment is required, other than routine age-related re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Description of the type of syncope • Date of the last episode

Rationale	CCS recommendation. 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
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19.6.6 Recurrent situational syncope with an avoidable trigger

This guideline applies to 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.

National Standard	All drivers eligible for a licence if <ul style="list-style-type: none"> • it has been at least one week since the last episode of syncope
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	No re-assessment, other than routine age-related re-assessment is required for individuals with situational syncope.
Information from health care providers	<ul style="list-style-type: none"> • Description of the type of syncope • Date of the last episode of syncope
Rationale	CCS recommendation

19.6.7 Recurrent atypical vasovagal or recurrent unexplained syncope – Non- commercial drivers

This guideline applies to non-commercial drivers who have had two or more episodes of atypical vasovagal syncope, or unexplained syncope within a 12 month period.

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.

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been at least three months since the last episode of syncope, and • the conditions for maintaining a licence are met
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BC Guidelines	<p>If further information is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or additional information from the treating physician
Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have another episode of syncope
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in one year • If no further episodes of syncope are reported at that time, no further re-assessment is required, other than routine age-related re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Description of the type of syncope • Date of the last episode of syncope
Rationale	<p>CCS recommendation. 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</p>

19.6.8 Single episode of typical vasovagal syncope – Commercial drivers

This guideline applies to commercial drivers who have had a single episode of typical vasovagal syncope within a 12 month period.

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.

National Standard	<p>Commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • the conditions for maintaining a licence are met
BC Guidelines	<p>RoadSafetyBC will not generally request further information</p>
Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have another episode of syncope
Reassessment	<p>No re-assessment, other than routine commercial re-assessment, is required</p>

Information from health care providers	Description of the type of syncope
Rationale	CCS recommendation

19.6.9 Syncope with a diagnosed and treated cause – Commercial drivers

This guideline applies to commercial drivers who have syncope with a diagnosed and treated cause (e.g. pacemaker for bradycardia).

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been at least one month since successful treatment, and • the conditions for maintaining a licence are met
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	RoadSafetyBC will impose the following condition on an individual who is found fit to drive <ul style="list-style-type: none"> • you must report to RoadSafetyBC and your physician if you have another episode of syncope
Reassessment	No re-assessment, other than routine commercial re-assessment is required, unless re-assessment is required because of the underlying medical condition or treatment
Information from health care providers	<ul style="list-style-type: none"> • Description of the cause of the syncope • Date of treatment • Opinion of the treating physician whether the treatment was successful
Rationale	CCS recommendation

19.6.10 Single or recurrent unexplained, single or recurrent atypical vasovagal, or recurrent typical vasovagal syncope – Commercial drivers

This standard applies to commercial drivers who have had:

- single or recurrent atypical vasovagal syncope
- single or recurrent unexplained syncope, or
- recurrent typical vasovagal syncope within a 12 month period.

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.

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.

National Standard	Commercial drivers eligible for a licence if <ul style="list-style-type: none"> • it has been at least 12 months since the last episode of syncope, and • the conditions for maintaining a licence are met
BC Guidelines	If further information is required, RoadSafetyBC may request <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or additional information from the treating physician
Conditions for maintaining licence	RoadSafetyBC 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 syncope, and • you must report to RoadSafetyBC and your physician if you have another episode of syncope
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in one year. • If no further episodes of syncope are reported at that time, no further re-assessment is required, other than routine commercial re-assessment
Information from health care providers	<ul style="list-style-type: none"> • Description of the type of syncope • Date of the last episode of syncope • Opinion of treating physician whether the driver is compliant with the treatment regime and the physician's advice regarding prevention of syncope
Rationale	CCS recommendation. 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

Chapter 20: Traumatic brain injury

20.1 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. Possible cognitive impairments include deficits in:

- 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.

20.2 Prevalence

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.

20.3 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.

20.4 Effect on functional ability to drive

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	Medical assessments Functional assessment
	Episodic impairment: Medical assessment – likelihood of impairment	Variable – sudden impairment (epilepsy)	Medical assessments

Traumatic brain injury may result in a persistent cognitive, motor or sensory impairment, or an episodic impairment (epilepsy), or both.

20.5 Compensation

Drivers 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 knobRestriction to automatic transmission or power-assisted brakes	<ul style="list-style-type: none">Scanning horizon more frequentlyTurning head 90° to maximize area scannedLarge left and right side mirrors

20.6 Guidelines for assessment

20.6.1 Traumatic brain injury

If a driver has epilepsy as a result of a TBI, also see the standards in [Chapter 17](#).

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • movement and strength are sufficient to perform the functions necessary for driving • cognitive and visual functions necessary for driving are not impaired • any pain associated with the condition, and any treatment for the condition, do not impair the functional abilities necessary for driving • where required, a functional assessment indicates that the driver is able to compensate for any loss of functional ability necessary for driving, and • the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's medical condition is required, RoadSafetyBC may request <ul style="list-style-type: none"> ○ a Driver's Medical Examination Report ○ additional information from the treating physician, or an assessment from a specialist • If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC may request <ul style="list-style-type: none"> ○ 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
Conditions for maintaining licence	No conditions are required
Restrictions	<p>RoadSafetyBC 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> <ul style="list-style-type: none"> • 26 Specified vehicle modifications required • 28 Restricted to automatic transmission • 51 [specify type of restriction]
Reassessment	No re-assessment is required, other than routine commercial or age-related re-assessment

Information from health care providers	<ul style="list-style-type: none"> • Whether the driver suffers from epilepsy as a result of the TBI. See the standards under <u>Chapter 17</u> if epilepsy is present • Opinion of treating physician on whether the driver has a loss of movement or strength that may affect functional ability to drive • Opinion of treating physician on whether pain or treatment may adversely affect functional ability to drive • Opinion of treating physician on whether the driver suffers from diplopia and/or a visual field deficit that may affect functional ability to drive. See the standards under <u>Chapter 22</u> if the treating physician indicates that either of these conditions may be present. • Where required, the results of a functional assessment
Rationale	The potential functional impairments associated with traumatic brain injury are variable

Chapter 21: Vestibular disorders

21.1 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
Drop Attacks (Tumarkin's Otolithic Crisis)	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

21.2 Prevalence

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.

21.3 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.

21.4 Effect on functional ability 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) • Drop Attacks (Tumarkin's Otolithic Crisis) 	Episodic impairment: Medical assessment – likelihood of impairment	Sensorimotor	Medical assessments
	Persistent impairment: Functional assessment	Cognitive	Medical assessments Functional 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	Medical assessments Functional assessment

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, manoeuvring 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.

21.5 Compensation

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

21.6 Guideline for assessment

21.6.1 Recurrent episodes of vertigo that occur with warning symptoms

This may include drivers with:

- benign paroxysmal positioning vertigo (BPPV)
- Meniere's disease
- vestibular neuronitis (labyrinthitis)
- migraines, or
- psychogenic vertigo/anxiety (hyperventilation syndrome).

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • warning symptoms do not themselves impair ability to drive • warning symptoms are of a sufficient duration to allow a driver to safely pull off the road, and • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report; or • additional information from the treating physician

Conditions for maintaining licence	RoadSafetyBC will impose the following condition on an individual who is found fit to drive <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
Reassessment	No re-assessment, other than routine commercial or age-related assessment, is required
Information from health care providers	<ul style="list-style-type: none"> • Description of warning symptoms and effect on functional ability • Whether the driver has insight into the impact their vestibular dysfunction may have on driving • History of compliance with prescribed treatment regime • If known, whether the driver is compliant with any current conditions of licence related to their vestibular dysfunction
Rationale	The risk from an episodic vestibular dysfunction can be mitigated where the episode is consistently preceded by warning symptoms that are not incapacitating and which last long enough for a driver to safely stop their driving until the episode is over

21.6.2 Recurrent episodes of vestibular dysfunction that occur without warning symptoms – All drivers

This may include drivers with:

- benign paroxysmal positioning vertigo (BPPV)
- Meniere's disease
- vestibular neuronitis (labyrinthitis)
- migraines, or
- psychogenic vertigo/anxiety (hyperventilation syndrome).

National Standard	All drivers eligible for a licence if <ul style="list-style-type: none"> • it has been at least 6 months since an episode of vestibular dysfunction • the treating physician or specialist indicates that their symptoms have been controlled or have abated, and • the conditions for maintaining a licence are met
BC Guidelines	If further information regarding an individual's medical condition is required, RoadSafetyBC may request <ul style="list-style-type: none"> • a Driver's Medical Examination Report • additional information from the treating physician, or an assessment from a specialist

Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have an episode of vestibular dysfunction
Reassessment	No re-assessment, other than routine commercial or age-related assessment, is required
Information from health care providers	<ul style="list-style-type: none"> • Date of last episode of vestibular dysfunction • Treating physician's opinion as to whether the symptoms have been controlled or have abated • Treating physician's opinion as to whether the driver has insight into the impact their vestibular dysfunction may have on driving • History of compliance with prescribed treatment regime • If known or applicable, whether the driver is compliant with any current conditions of licence related to their vestibular dysfunction
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

21.6.3 Drop attacks (Tumarkin's otolithic crisis)

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> • it has been at least 6 months since experiencing a drop attack, or • the treating physician indicates that the attacks have been successfully treated, and • the conditions for maintaining a licence are met
BC Guidelines	<p>If further information regarding an individual's medical condition is required, RoadSafetyBC may request</p> <ul style="list-style-type: none"> • a Driver's Medical Examination Report, or additional information from the treating physician

Conditions for maintaining licence	<p>RoadSafetyBC 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 RoadSafetyBC and your physician if you have a drop attack
Reassessment	<ul style="list-style-type: none"> • If an attack occurred within the past 12 months, RoadSafetyBC will re-assess in one year. • If no new attacks are reported at that time, RoadSafetyBC will re-assess in 5 years, or in accordance with the schedule for routine commercial or age-related re-assessment. • If no new attacks are reported at that time, no further re-assessment is required, other than routine commercial or age-related re-assessment
Information from health care providers.	<ul style="list-style-type: none"> • Date of last drop attack or opinion of treating physician as to success of treatment • Treating physician's opinion as to whether the driver has insight into the impact their condition may have on driving • History of compliance with prescribed treatment regime • If known or applicable, whether the driver is compliant with any current conditions of licence related to their vestibular disorder
Rationale	<p>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</p>

21.6.4 Single episode of vestibular dysfunction – transient impairment

National Standard	All drivers eligible for a licence
BC Guidelines	RoadSafetyBC will not generally request further information
Conditions for maintaining licence	None
Reassessment	No re-assessment, other than routine commercial or age-related re-assessment, is required
Information from health care providers.	None
Rationale	A single episode of vestibular dysfunction is a transient impairment

21.6.5 Vestibular disorder resulting in a persistent impairment

National Standard	<p>All drivers eligible for a licence if</p> <ul style="list-style-type: none"> functional assessments indicate ability required for driving safely
BC Guidelines	<ul style="list-style-type: none"> If further information regarding an individual's medical condition is required, RoadSafetyBC will request <ul style="list-style-type: none"> a Driver's Medical Examination Report, or additional information from the treating physician If the treating physician indicates possible impairment of one or more of the functions necessary for driving, RoadSafetyBC will request <ul style="list-style-type: none"> 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
Conditions for maintaining licence	No conditions are required
Reassessment	RoadSafetyBC will determine the appropriate re-assessment interval on an individual basis
Information from health care providers.	<ul style="list-style-type: none"> Results of functional assessment Treating physician's opinion as to whether the driver has insight into the impact their vestibular disorder may have on driving History of compliance with prescribed treatment regime If known or applicable, whether the driver is compliant with any current conditions of licence related to their vestibular dysfunction
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 22: Vision impairment

22.1 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 the above.

This chapter focuses on common vision impairments and medical conditions and treatments that can cause vision impairments.

Common vision impairments

Impaired 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 22.7.1

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 licensing decisions than static visual acuity. However, barriers to the use of dynamic visual acuity for 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.

Myopia, hyperopia, presbyopia and astigmatism (refractive errors)

Myopia, hyperopia, presbyopia 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 40s.

Astigmatism is a visual condition that results in blurred vision. It commonly occurs with other conditions such as myopia and hyperopia.

Visual field loss

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 center 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 table and diagram on the following two pages provide further information on various types of visual field defects. The term “scotoma” refers to any area where the area of lost visual field is surrounded by normal vision.

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 a stroke, trauma or tumour. They are not usually caused by a problem with the eye itself.

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.

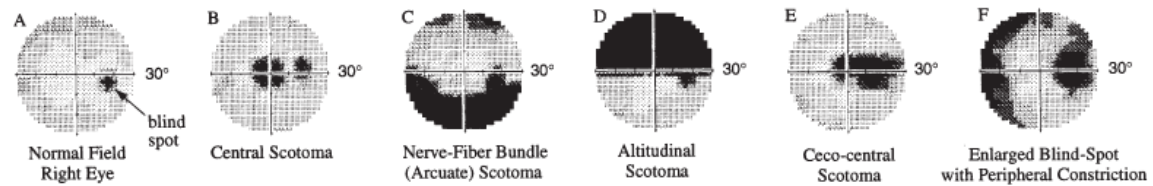
Unawareness of visual field deficits has an obvious negative impact on safe driving performance.

Types of visual field defects²⁰		
Type	Description	Causes
Altitudinal field defect	Loss of all or part of the superior or inferior half of the visual field, but in no case does the defect cross the horizontal median	More common: Ischemic optic neuropathy, hemibranch retinal artery occlusion, retinal detachment Less common: Glaucoma, optic nerve or chiasmal lesion, optic nerve coloboma
Arcuate scotoma	A small, arcuate-shaped field loss due to damage to the ganglion cells that feed into a particular part of the optic nerve head, which follows the arcuate shape of the nerve fibre pattern; the defect does not cross the horizontal median	More common: Glaucoma Less common: Ischemic optic neuropathy (especially nonarteritic), optic disk drusen, high myopia
Binasal field defect (uncommon)	Loss of all or part of the medial half of both visual fields; the defect does not cross the vertical median	More common: Glaucoma, bitemporal retinal disease (e.g. retinitis pigmentosa) Rare: Bilateral occipital disease, tumour or aneurysm compressing both optic nerves
Bitemporal hemianopia	Loss of all or part of the lateral half of both visual fields; the defect does not cross the vertical median	More common: Chiasmal lesion (e.g. pituitary adenoma, meningioma, craniopharyngioma, aneurysm, glioma) Less common: Tilted optic disks Rare: Nasal retinitis pigmentosa
Blind-spot enlargement	Enlargement of the normal blind spot at the optic nerve head	Papilledema, optic nerve drusen, optic nerve coloboma, myelinated nerve fibres at the optic disk, drugs, myopic disk with a crescent
Central scotoma	A loss of visual function in the middle of the visual field, typically affecting the fovea centralis	Macular disease, optic neuropathy (e.g. ischemic, Leber's hereditary, optic neuritis), optic atrophy (e.g. from tumour compressing the nerve, toxic/metabolic disease) Rare: Occipital cortex lesion
Homonymous hemianopia	Loss of part or all of the left half or right half of both visual fields; the defect does not cross the vertical median	Optic tract or lateral geniculate body lesion; temporal, parietal, or occipital lobe lesion of the brain (stroke and tumour more common; aneurysm and trauma less common). Migraine may cause a transient homonymous hemianopia
Constriction of the peripheral fields leaving only a small residual central field	Loss of the outer part of the entire visual field in one or both eyes	Glaucoma, retinitis pigmentosa or some other peripheral retinal disorder, chronic papilledema after panretinal photocoagulation, central retinal artery occlusion with cilioretinal artery sparing, bilateral occipital lobe infarction with macular sparing, nonphysiologic vision loss, carcinoma-associated retinopathy Rare: drugs

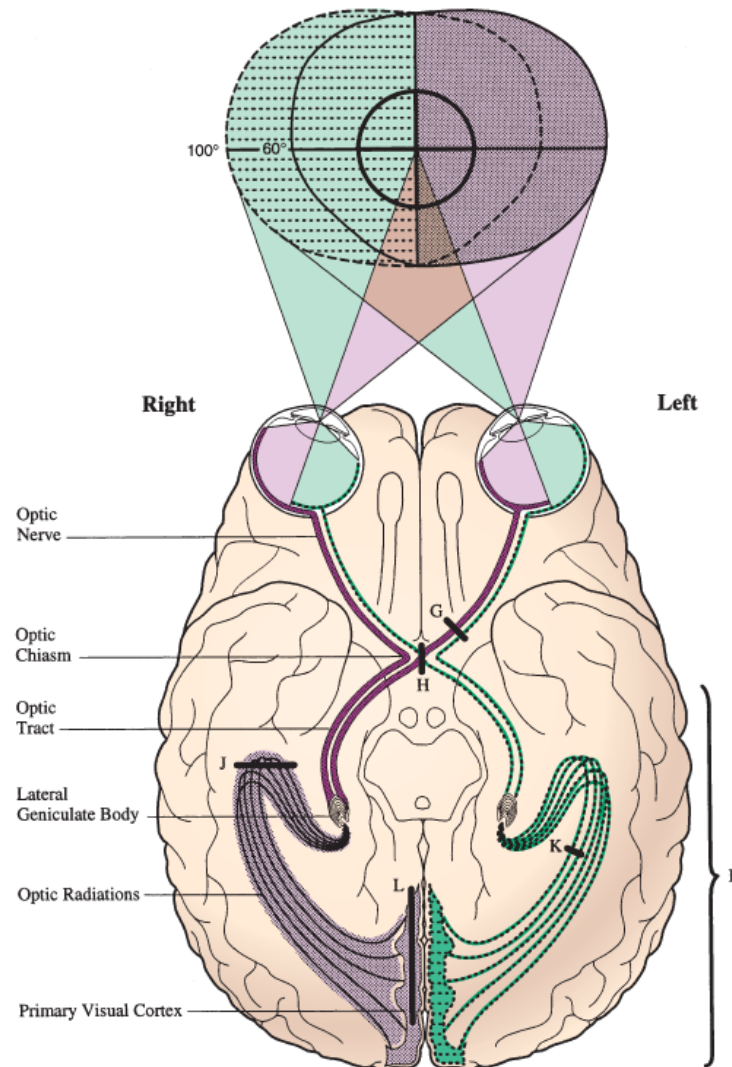
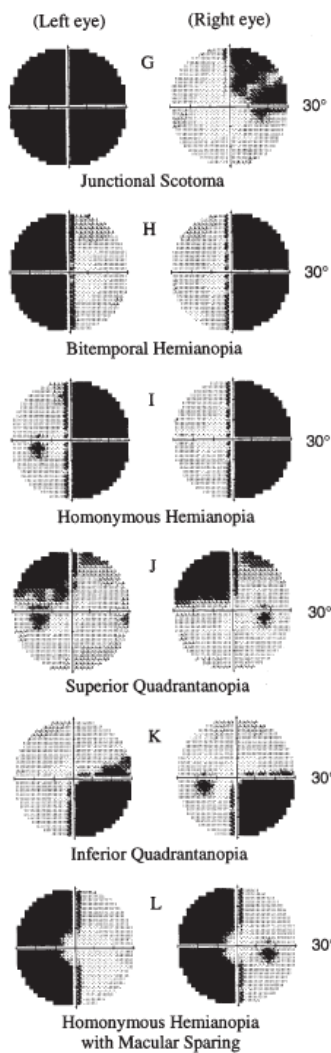
²⁰ From <http://www.merck.com/mmpe/sec09/ch098/ch098a.html> - Adapted from *The Wills Eye Manual*, Douglas J. Rhee, M.D. and Mark F. Pyfer, M.D. © 1999 by Lippincott Williams & Wilkins.

Visual field defects diagram²¹

Monocular Prechiasmal Field Defects:



Binocular Chiasmal or Postchiasmal Field Defects:



²¹ Longo, D. L. (Ed.). (2011). *Harrison's Principles of Internal Medicine*, The United States: McGraw Hill Medical.

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.

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, drivers learn to compensate for the inability to distinguish colours when driving.

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.

Impaired 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. Cataracts and corneal edema are also associated with prolonged glare recovery.

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.

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 impairments

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, 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 below²².



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, 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 below²³.



Normal vision



Vision of individual
with
glaucoma

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 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 below²⁴.



Normal vision



Vision of individual with macular degeneration

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 impairments

Laser surgery – LASIK and PRP

Laser surgery may 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.

²² Source National Eye Institute - http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

²³ Source National Eye Institute - http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

²⁴ Source National Eye Institute - http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

22.2 Prevalence

Common 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, presbyopia and astigmatism (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 recovery.

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.

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 aged 40 years 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 using 2010 data, 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.

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%.

22.3 Vision impairments and adverse driving outcomes

Common vision impairments

Impaired visual acuity

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.

Impaired 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 authorities 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

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. Medical conditions causing vision impairments

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 drivers 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 (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.

Glaucoma

There is evidence that drivers with glaucoma are at a significantly greater risk for impaired driving performance than those without the disease, likely due to loss of visual field.

Age-related macular degeneration (ARMD) and retinitis pigmentosa

There is little research on the relationship between ARMD or retinitis pigmentosa and driving performance.

22.4 Effect on functional ability to drive

Condition	Type of driving impairment and assessment approach	Primary functional ability affected	Assessment tools
Vision impairment	Persistent impairment: Functional assessment	Sensory - Vision	Medical assessments Visual assessment field test Functional assessment

Drivers 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 a driver can see.

Drivers with reduced contrast sensitivity may have difficulty seeing traffic lights or cars at night. Limitations in research and testing preclude standards for impairments in contrast sensitivity, dark adaptation or glare recovery, although some individuals with these impairments may not be able to drive safely.

22.5 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 the 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 drivers 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

Low vision and telescopic lens aids cannot be used to meet the vision standard.

Telescopic (bioptic) lenses are sometimes used to assist drivers 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 drivers with low vision. Although limited, studies indicate that drivers with low vision who drive with telescopic lenses have higher crash rates.

Prism lenses/eye patch

Drivers 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

Drivers 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

Drivers 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.

Exceptional Cases

The loss of some visual functions can be compensated for adequately, particularly in the case of long-standing or congenital impairments. When an individual becomes visually impaired, the capacity to drive safely varies with his/her compensatory abilities. As a result, there may be individuals with visual deficits who do not meet the vision standards for driving but who are able to drive safely. On the other hand, there may be individuals with milder deficits who do meet the vision standards but who cannot drive safely.

In these exceptional situations, it is recommended that the individual undergo a special assessment for the fitness to drive. The decision on fitness to drive can only be made by the appropriate licensing authorities. However, it is recommended the following information be taken into consideration: (1) favourable reports from the ophthalmologist or optometrist; (2) good driving record; (3) stability of the condition; (4) no other significant medical contraindications; (5) other references (e.g. professional, employment, etc); (6) functional assessment.

In some cases it may be reasonable to grant a restricted or conditional licence to an individual to ensure safe driving. It may also be appropriate to make such permits exclusive to a single class of vehicles.

22.6 Guidelines for assessment

22.6.1 Impaired visual acuity – Non-commercial drivers

National Standard	<p>Non-commercial drivers eligible for a licence if</p> <ul style="list-style-type: none"> • visual acuity is not less than 20/50 (6/15) with both eyes open and examined together, and • the conditions for maintaining a licence are met
BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's visual acuity is required, RoadSafetyBC may request <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 • The recommended testing procedures are outlined in <u>22.7.1</u> • RoadSafetyBC may find individuals fit to drive a non-commercial vehicles if <ul style="list-style-type: none"> ○ they meet above standard, or a functional assessment indicates that they have the functional ability required for their class of licence held • If an individual has a best corrected visual acuity of 20/60 and 20/70 with both eyes open and examined together, RoadSafetyBC may request <ul style="list-style-type: none"> ○ an ICBC road test. RoadSafetyBC will not generally request an ICBC road test for individuals who have a visual acuity of less than 20/70 • If the individual's best corrected visual acuity is worse than 20/70, the individual may be offered the opportunity to complete a functional driving evaluation with a specialist.
Conditions for maintaining licence	No conditions are required.
Restrictions	<p>RoadSafetyBC will impose the following restriction on an individual who requires corrective lenses in order to meet the fitness guidelines</p> <ul style="list-style-type: none"> • 21 Corrective lenses required

Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in accordance with routine age-related re-assessment if the condition causing the visual acuity loss is not progressive • RoadSafetyBC will determine the appropriate reassessment interval on an individual basis for drivers with impaired visual acuity that is progressive such as cataracts, macular degeneration, glaucoma and diabetic retinopathy • Depending upon their visual acuity, individuals with best corrected vision of 20/40 or better will typically be re-assessed every two years. Individuals with best corrected vision of 20/50 or worse will typically be re-assessed annually
Information from health care providers	Uncorrected and corrected standard rating of visual acuity for both eyes open, and examined together. Standards for testing visual acuity are outlined in <u>22.7.1</u>
Rationale	There is little research evidence regarding the level of visual acuity required for driving fitness. The minimum acuity requirement in the standard is based on consensus medical opinion in Canada.

22.6.2 Impaired visual acuity – Commercial drivers

National Standard	<ul style="list-style-type: none"> • Commercial drivers eligible for a licence if Class 4 (Taxi) and 5 (commercial) <ul style="list-style-type: none"> ○ visual acuity is not less than 20/40 (6/12) with both eyes open and examined together. Worse eye not less than 20/200 (6/60) • Class 1-4 (Emergency) <ul style="list-style-type: none"> ○ visual acuity is not less than 20/30 (6/9) with both eyes open and examined together. Worse eye not less than 20/100 (6/30)
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BC Guidelines	<ul style="list-style-type: none"> • If further information regarding an individual's visual acuity is required, RoadSafetyBC may request either <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 • The recommended testing procedures are outlined in <u>22.7.1</u> • RoadSafetyBC may find individuals fit to drive any type of commercial vehicles if <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 • If an individual has a best corrected visual acuity of 20/40 and 20/50 with both eyes open and examined together, RoadSafetyBC will request an ICBC road test. RoadSafetyBC will not generally request an ICBC road test for individuals who have a visual acuity of less than 20/50 • If the individual's best corrected visual acuity is worse than 20/50, the individual may be offered the opportunity to complete a functional driving evaluation with a specialist
Conditions for maintaining licence	No conditions are required
Restrictions	RoadSafetyBC will impose the following restriction on an individual who requires corrective lenses in order to meet the fitness guidelines: <ul style="list-style-type: none"> • 21 Corrective lenses required
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in accordance with routine commercial re-assessment, if the condition causing the visual acuity loss is not progressive • RoadSafetyBC will determine the appropriate reassessment interval on an individual basis for drivers with impaired visual acuity that is progressive such as cataracts, macular degeneration, glaucoma and diabetic retinopathy • Depending upon their visual acuity, individuals with best corrected vision of 20/30 or better will typically be re-assessed every two years. Individuals with best corrected vision of 20/40 or worse will typically be re-assessed annually

Information from health care providers	Uncorrected and corrected standard rating of visual acuity for both eyes open, and examined together. Standards for testing visual acuity are outlined in <u>22.7.1</u>
Rationale	There is little research evidence regarding the level of visual acuity required for driving fitness. The minimum acuity requirement in the standard is based on consensus medical opinion in Canada

22.6.3 Visual field loss – Non-commercial drivers

National Standard	Non-commercial drivers eligible for a licence if <ul style="list-style-type: none"> • 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
BC Guidelines	<ul style="list-style-type: none"> • Driver fitness determinations that involve interpretation of a visual field study will be made by nurse case managers • If further information regarding an individual's visual field loss is required, RoadSafetyBC will request <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 • The recommended testing procedures are outlined in <u>22.7.2</u> • If an individual does not meet the visual field standard, RoadSafetyBC may request <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
Conditions for maintaining licence	No conditions are required.

Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in accordance with routine age-related re-assessment if the condition causing the visual field loss is not progressive (e.g. eye trauma, stroke, head injury) • RoadSafetyBC will determine the appropriate reassessment interval on an individual basis for drivers with medical conditions that cause progressive visual field loss, such as: <ul style="list-style-type: none"> • retinitis pigmentosa • diabetic retinopathy • vascular retinopathy • glaucoma, or • brain tumour • RoadSafetyBC will re-assess by issuing an EVF typically every 1 to 3 years, depending upon the rate of progression and severity of the visual field loss
Information from health care providers	Binocular field print using an approved visual field testing technique. Standards for testing visual field loss are outlined in <u>22.7.2</u>
Rationale	There is little research evidence regarding the level of visual field required for driving fitness. The minimum visual field requirement in the standard is based on consensus medical opinion in Canada

22.6.4 Visual field loss – Commercial drivers

National Standard	<ul style="list-style-type: none"> • Commercial drivers eligible for a licence if Class 4 (Taxi) and 5 (commercial) <ul style="list-style-type: none"> ○ 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 • Class 1-4 (Emergency) <ul style="list-style-type: none"> ○ 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
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BC Guidelines	<ul style="list-style-type: none"> • Driver fitness determinations that involve interpretation of a visual field study will be made by nurse case managers. • If further information regarding an individual's visual field loss is required, RoadSafetyBC will request <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. • The recommended testing procedures are outlined in <u>22.7.2</u> • RoadSafetyBC may find individuals fit to drive any type of commercial vehicles if <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 • If an individual does not meet the visual field standard outlined above, RoadSafetyBC may request <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
Conditions for maintaining licence	No conditions are required
Reassessment	<ul style="list-style-type: none"> • RoadSafetyBC will re-assess in accordance with routine commercial re-assessment if the condition causing the visual field loss is not progressive (e.g. eye trauma, stroke, head injury) • RoadSafetyBC will determine the appropriate reassessment interval on an individual basis for drivers with other medical conditions that cause progressive visual field loss, such as <ul style="list-style-type: none"> ○ retinitis pigmentosa ○ vascular retinopathy ○ glaucoma, or ○ brain tumour • RoadSafetyBC will re-assess by issuing an EVF typically every 1 to 3 years, depending upon the rate of progression and severity of the visual field loss. • RoadSafetyBC will typically re-assess commercial drivers with diabetic retinopathy annually in accordance with the guidelines for commercial drivers with diabetes.

Information from health care providers	Binocular field print using an approved visual field testing technique. Standards for testing visual field loss are outlined in <u>22.7.2</u>
Rationale	There is little research evidence regarding the level of visual field required for driving fitness. The minimum visual field requirement in the standard is based on consensus medical opinion in Canada

22.6.5 Loss of stereoscopic depth perception or monocularly – All drivers

National Standard	<ul style="list-style-type: none"> • All drivers eligible for a licence if <ul style="list-style-type: none"> ○ standards for visual acuity and visual fields are met ○ the treating ophthalmologist or optometrist indicates sufficient time has elapsed since loss of stereoscopic depth perception to allow the driver to adjust and compensate for the change in vision. • Where required, a road test or other functional assessment indicates the driver is able to compensate for any loss of functional ability necessary for driving, and <ul style="list-style-type: none"> ○ the conditions for maintaining a license are met
BC Guidelines	<ul style="list-style-type: none"> • RoadSafetyBC will not generally request further information for non-commercial drivers • RoadSafetyBC may request an ICBC road test for commercial drivers • RoadSafetyBC may find non-commercial drivers fit to drive if <ul style="list-style-type: none"> ○ 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. • RoadSafetyBC may find commercial drivers fit to drive if <ul style="list-style-type: none"> ○ they successfully complete an ICBC road test that indicates they are able to compensate for their change in vision
Conditions for maintaining licence	No conditions are required.
Reassessment	RoadSafetyBC will not re-assess, other than routine commercial or age-related re-assessment

Information from health care providers	<ul style="list-style-type: none"> • Date of loss of stereoscopic depth perception • Opinion of a vision specialist whether the driver has adjusted and compensated for the change in vision
Rationale	<p>Drivers 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>

22.6.6 Diplopia

This guideline applies to drivers with diplopia within the central 40 degrees of primary gaze (i.e. 20 degrees to the left, right, above, and below fixation).

National Standard	<ul style="list-style-type: none"> • Eligible for any class of licence if <ul style="list-style-type: none"> ○ the diplopia can be corrected using prism lenses so that they no longer have diplopia within the central 40 degrees of primary gaze ○ visual acuity and visual fields are met with prisms ○ the treating ophthalmologist or optometrist indicates that adequate adjustment has occurred, and ○ when required a functional assessment indicates the driver is able to compensate for any loss of functional ability necessary for driving
BC Guidelines	<ul style="list-style-type: none"> • If further information is required, RoadSafetyBC will request an Examination of Visual Functions (EVF) • RoadSafetyBC 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
Conditions for maintaining licence	No conditions are required
Restrictions	<ul style="list-style-type: none"> • RoadSafetyBC will impose the following restriction on an individual who requires prism lenses in order to meet the fitness guidelines: <ul style="list-style-type: none"> ○ 21 Corrective lenses required • RoadSafetyBC will impose the following restriction on an individual who requires an eye patch in order to meet the fitness guidelines: <ul style="list-style-type: none"> ○ 51 Must patch one eye while driving
Reassessment	If the diplopia is the result of a progressive condition, RoadSafetyBC will re-assess as recommended by the treating physician or in accordance with the re-assessment guidelines for that medical condition. Otherwise, no re-assessment, other than routine commercial or age-related re-assessment, is required.
Information from health care providers	<ul style="list-style-type: none"> • Description of corrective mechanism • Opinion of vision specialist whether adequate adjustment has occurred

Rationale	Consensus medical opinion in Canada indicates that an individual who has diplopia within the central 40 degrees of primary gaze is not eligible for a licence unless they can compensate for this impairment by wearing an eye patch or prism lenses while driving
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22.6.7 Impaired colour vision

National Standard	All drivers eligible for a licence if <ul style="list-style-type: none"> • Drivers can discriminate between different traffic lights
BC Guidelines	RoadSafetyBC will not generally request further information.
Conditions for maintaining licence	None
Reassessment	No re-assessment, other than routine commercial or age-related re-assessment, is required.
Information from health care providers	Opinion of treating physician whether a lack of insight or cognitive impairment impairs the ability to compensate
Rationale	Impaired colour vision is usually congenital and in general, drivers learn to compensate for the inability to distinguish colours when driving.

22.7 Standards for testing visual functions

22.7.1 Visual acuity

The distance visual acuity of drivers 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) conditions. It is recommended that visual acuity be assessed using a Snellen chart (see below) 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.

Snellen chart and standard ratings of visual acuity

A	20/200
D F	20/100
H Z P	20/70
T X U D	20/50
Z A D N H	20/40
P N T U H X	20/30
U A Z N F D T	20/25
N P H T A F X U	20/20
X D F H P T Z A N	20/15
F A X T D N H U P Z	20/10

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

22.7.2 Visual field

When a confrontational field assessment is carried out to screen for visual field defects the following procedure should be used at 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 driver should be referred to an ophthalmologist or optometrist for a full assessment. During a full assessment, binocular testing is required and 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.

22.7.3 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 Canadian Ophthalmological Society 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.

22.7.4 Examination of visual functions form (EVF)

	EXAMINATION OF VISUAL FUNCTIONS (EVF) Billing is done by the Optometrist through the MSP Billing System (see form back)		OPTOMETRISTS MSP Fee Code 96224 (EVF Only)
	PERSONAL HEALTH NUMBER (MUST BE COMPLETED)		OR MSP Fee Code 96223 (EVF and VFT)
	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>		

**THIS REPORT MUST BE COMPLETED IN FULL BY AN OPTOMETRIST AND RETURNED WITHIN 30 DAYS TO
ROADSAFETYBC.**

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 (Class 1-4 require evidence of 150 degrees. Class 5-8 require evidence of 120 degrees)			
2. BINOCULAR DEGREES OF CONTINUOUS FIELD OF VISION ABOVE AND BELOW FIXATION WHILE WEARING CORRECTION (Class 1-4 require evidence of 20 degrees. Class 5-8 require evidence of 15 degrees)			
3. VISUAL FIELD DEFICIT	<input type="checkbox"/> NO	<input type="checkbox"/> YES	IF YES, A VISUAL FIELD TEST IS REQUIRED. REVERSE FOR APPROVED STUDY TYPES
4. PROGRESSIVE EYE CONDITION	<input type="checkbox"/> NO	<input type="checkbox"/> YES	IF YES, PROVIDE DIAGNOSIS AND DESCRIBE FULLY.
5. DIPLOPIA IN CENTRAL FIELD (40 degrees)	<input type="checkbox"/> NO	<input type="checkbox"/> YES	IF YES, HOW DOES THE DRIVER COMPENSATE? DESCRIBE FULLY.
6. OTHER SIGNIFICANT OCULAR DEFECTS	<input type="checkbox"/> NO	<input type="checkbox"/> YES	IF YES, PROVIDE DIAGNOSIS AND DESCRIBE FULLY.
7. WERE NEW LENSES FOR DRIVING PRESCRIBED?	<input type="checkbox"/> NO	<input type="checkbox"/> YES	
EXAMINING OPTOMETRIST'S NAME AND ADDRESS (Use Rubber Stamp or Print)		EXAMINATION DATE (YYYY/MM/DD)	
TELEPHONE NUMBER:		SIGNATURE OF EXAMINING OPTOMETRIST	
The personal information is collected under section 26 (a) and (c) of the Freedom of Information and Protection of Privacy Act for the purpose of administering the Motor Vehicle Act. If you have any questions about the collection, use and disclosure of the information collected, contact RoadSafetyBC at PO Box 9254 Stn Prov Govt, Victoria BC, V8W 9J2, phone 250-387-7747.			
Ministry of Public Safety and Solicitor General	RoadSafetyBC www.pssg.gov.bc.ca/roadsafetybc	PO Box 9254 Stn Prov Gov Victoria BC V8W 9J2	Telephone: (250) 387-7747 Facsimile: (250) 952-8888
MV 2009 (Rev: 02/16)			

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 Licensing Office (DLO).
- 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 RoadSafetyBC 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 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.

Billing is done by your optometrist through the MSP billing system for completing this form as follows:

- Examination of Visual Functions only: \$70
- Examination of Visual Functions and Visual Field Test at the same appointment: \$102

Please note that RoadSafetyBC has no authority to set the fee optometrists charge. Optometrists are entitled to set their own fee and to bill patients directly for either their full fee or any portion of the fee that exceeds the amount they may bill through Teleplan.

The Teleplan arrangement avoids the cost of setting up a duplicate billing system and maximizes the fee that can be paid to for completion of this form. However, it also means that there is no duplicate process at RoadSafetyBC or elsewhere to reimburse any patient or other party when optometrists elect to bill privately. That is, there is no reimbursement by RoadSafetyBC of fees that are billed directly to the patient.


- Should you have questions please contact the Driver Medical Fitness Program, RoadSafetyBC, Victoria at (250) 387-7747.

To the optometrist:

This Examination of Visual Functions is paid by RoadSafetyBC and is billed through the Medical Services Plan Billing Codes located at the top right corner of the first page of this document System. If a computer-assisted visual field test is required it is also billable through MSP. Please refer to the MSP Fee.

VISUAL FIELD TEST (VFT)	
For drivers with visual field deficits, one of the following techniques should be documented and the visual field printout attached.	
<u>BINOCULAR TESTING IS REQUIRED.</u> Visual Field tests demonstrating only central fields to 60 degrees of horizontal vision ARE NOT ACCEPTABLE	
Class 5-8 Must have at least 120 continuous degrees along the horizontal meridian and 15 continuous degrees above and below fixation to meet standards for driving.	
Class 1-4 Must have at least 150 continuous degrees along the horizontal meridian and 20 continuous degrees above and below fixation to meet standards for driving.	
Accepted Test Formats:	
1 Goldmann III4e and V4e isopters	
1 Humphrey Esterman test	
1 Humphrey 81, 120, 135, or 248 point screener. If field is abnormal, set test strategy to 3 zone and all other parameters to standard. Two zone Humphrey testing is not acceptable.	
2 Medmont 700 Driving Field in numeric grid format showing absolute defects (<10 decibels) OR grid format clearly showing points seen and not seen; no shaded or expanded central fields .. <u>NO OTHER FORMATS ARE ACCEPTABLE.</u>	
DRIVER'S LICENCE CLASSIFICATIONS	
Class 1 Public passenger carrying and heavy commercial vehicles	Class 5 with endorsements 18 or 19 are assessed to Class 1 Standards
Class 2 Large public passenger carrying vehicles	Class 5 with endorsement 20 is assessed to Class 3 Standards
Class 3 Heavy commercial vehicles	Class 6 Motorcycles
Class 4 Public passenger carrying vehicles	Class 7 Learner driver's licence, passenger vehicles
Class 5 Passenger vehicles	Class 8 Learner driver's licence, motorcycles

22.7.5 Visual field test form (VFT)

	VISUAL FIELD TEST Paid for by RoadSafetyBC through the MSP Billing System (see form back)	OPTOMETRISTS MSP Fee Code 96225
	PERSONAL HEALTH NUMBER (MUST BE COMPLETED) <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	

THIS REPORT MUST BE COMPLETED IN FULL BY AN OPTOMETRIST AND RETURNED WITHIN 30 DAYS TO ROADSAFETYBC

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.

<p style="text-align: center;">Visual Field Test (VFT)</p> <p>For drivers with visual field deficits, one of the following techniques should be documented and the visual field printout attached.</p> <p><u>BINOCULAR TESTING IS REQUIRED.</u> Visual Field tests demonstrating only central fields to 60 degrees of horizontal vision ARE NOT ACCEPTABLE</p> <p>Class 5-8 Must have at least 120 continuous degrees along the horizontal meridian and 15 continuous degrees above and below fixation to meet standards for driving.</p> <p>Class 1-4 Must have at least 150 continuous degrees along the horizontal meridian and 20 continuous degrees above and below fixation to meet standards for driving.</p> <p>Accepted Test Formats:</p> <ol style="list-style-type: none"> Goldmann III4e and V4e isopters Humphrey Esterman test 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 not acceptable. Medmont 700 Driving Field in numeric grid format showing absolute defects (<10 decibels) OR grid format clearly showing points seen and not seen; no shaded or expanded central fields. <u>NO OTHER FORMATS ARE ACCEPTABLE.</u>

EXAMINING OPTOMETRIST'S NAME AND ADDRESS (Use Rubber Stamp or Print)	EXAMINATION DATE (YYYY/MM/DD)
TELEPHONE NUMBER:	SIGNATURE OF EXAMINING OPTOMETRIST

The personal information is collected under section 26 (a) and (c) of the *Freedom of Information and Protection of Privacy Act* for the purpose of administering the *Motor Vehicle Act*. If you have any questions about the collection, use and disclosure of the information collected, contact RoadSafetyBC at PO Box 9254 Stn Prov Govt, Victoria BC, V8W 9J2, phone 250-387-7747.

Ministry of Public Safety and Solicitor General MV0722 (Rev: 02/16)	RoadSafetyBC www.gov.bc.ca/roadsafetybc	PO BOX 9254 STN PROV GOVT VICTORIA BC V8W 9J2	Telephone: (250) 387-7747 Facsimile: (250) 952-8888
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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 RoadSafetyBC 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 RoadSafetyBC 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.
- RoadSafetyBC may be billed for \$42 by your optometrist through the Teleplan billing system for completing this form.
- Please note that RoadSafetyBC has no authority to set the fee optometrists charge. Optometrists are entitled to set their own fee and to bill patients directly for either their full fee or any portion of the fee that exceeds the amount they may bill through Teleplan.
- The Teleplan arrangement avoids the cost of setting up a duplicate billing system and maximizes the fee that can be paid to for completion of this form. However, it also means that there is no duplicate process at RoadSafetyBC or elsewhere to reimburse any patient or other party when optometrists elect to bill privately. That is, there is no reimbursement by RoadSafetyBC of fees that are billed directly to the patient.
- Should you have questions please contact the Driver Medical Fitness Program, RoadSafetyBC, Victoria at (250)387-7747.

To the optometrist:

This Visual Field Test is paid by RoadSafetyBC 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 5 Passenger vehicles
Class 2 Large public passenger carrying vehicles	Class 5 with endorsements 18 or 19 are assessed to Class 1 Standards
Class 3 Heavy commercial vehicles	Class 5 with endorsement 20 is assessed to Class 3 Standards
Class 4 Public passenger carrying vehicles	Class 6 Motorcycles
	Class 7 Learner driver's licence, passenger vehicles
	Class 8 Learner driver's licence, motorcycles





PART 4

APPENDICES

Appendix 1: BC Licence Classes

The table below describes the classes of B.C. driver licences

Class	Typical Vehicles
 Class 1	<ul style="list-style-type: none"> 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	<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

Class	Typical Vehicles
(restricted)	<p>than 10 persons (including the driver) used to transport 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 all-terrain 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	<ul style="list-style-type: none"> Motorcycles, all-terrain cycles, all-terrain vehicles (ATVs)
 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 2: Canada – US Reciprocity Agreement

Effective April 1, 1992, the US Department of Transport required all American commercial drivers to hold an American Commercial Drivers Licence (CDL).

In preparation for this requirement, a reciprocity agreement between Canada and the US completed 1989. This ensured that commercial driver's licences issued by Canadian provinces and territories under the National Safety Code Standards are recognised in the US. In fact, to ensure the one driver, one licence concept, the holder of a provincial or territorial commercial driver licence is prohibited from obtaining a CDL. The US Federal Register of Tuesday, May 23, 1989 proclaimed the Reciprocity Agreement.

Subsequently on December 30, 1998, Canada and the US signed reciprocity letters on medical fitness requirements for operators of commercial motor vehicles. The elements prescribed in the reciprocity agreement related to Canadian provinces and territories adhering to the National Safety Code (NSC) and that the licensing and testing standards were deemed equivalent to US standards. A similar evaluation by jurisdictions deemed the US CDL to be equivalent to the NSC.

Letters between the US and Canadian federal governments were used as the agreement, and when taken together constituted the understanding between Canada and the US respecting reciprocity of commercial driver licences.

By virtue of the agreement, the two countries medical standards were deemed equivalent with the exception of the requirements regarding (Cdn) (i) insulin-dependent diabetic drivers, (ii) hearing impaired drivers, (iii) drivers with epilepsy and (iv) drivers operating under a medical waiver or who are operating under medical *grandfather rights* who are prohibited from operating in international commerce.

Both countries agreed to adopt a unique identifier code to be displayed on the licence and the driving record to identify a commercial driver who is not qualified or disqualified from operating a commercial vehicle in the other country.

In December 2001, CCMTA agreed the Canadian identifier would be "W", and defined as: "restricted commercial class - Canada only". In December 2008, FMCSA announced it will implement the identifier "V" which will indicate the US driver is only allowed to drive in the US and is not medically qualified to drive in Canada. The identifier "V" is scheduled for implementation on January 2014.

As part of the Canada – US agreement commercial drivers (Class 1, 2, 3 and 4 licence holders) are required to file a satisfactory medical report on application, every 5 years to age 45, at least every 3 years from age 46 to 65 and annually thereafter.

Appendix 3: 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.

Appendix 4: 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, medical practitioner or nurse practitioner who has a patient 16 years of age or older who

(a) in the opinion of the psychologist, optometrist, medical practitioner or nurse 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, medical practitioner or nurse practitioner.

(2) Every psychologist, optometrist, medical practitioner or nurse 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, a medical practitioner or a nurse practitioner for making a report

under this section, unless the psychologist, optometrist, medical practitioner or nurse practitioner made the report falsely and maliciously.

Appendix 5: Aging Drivers

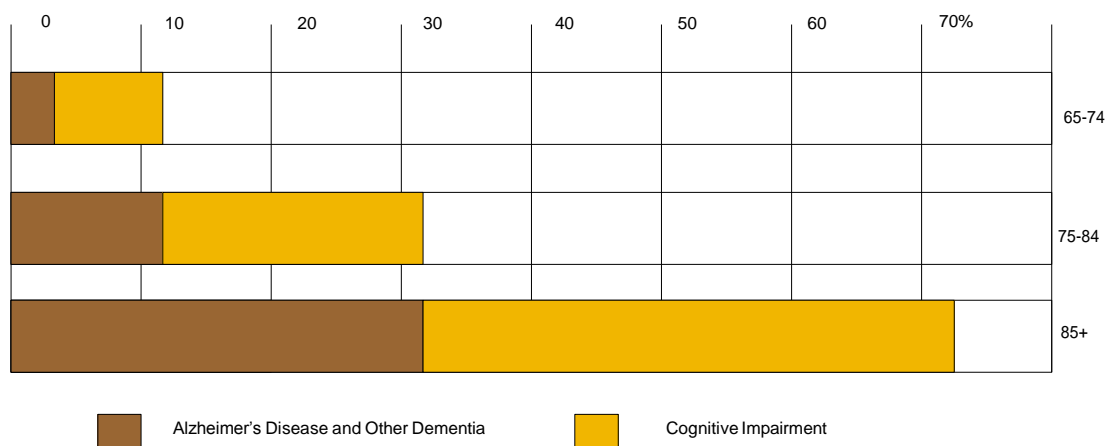
About aging drivers

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.

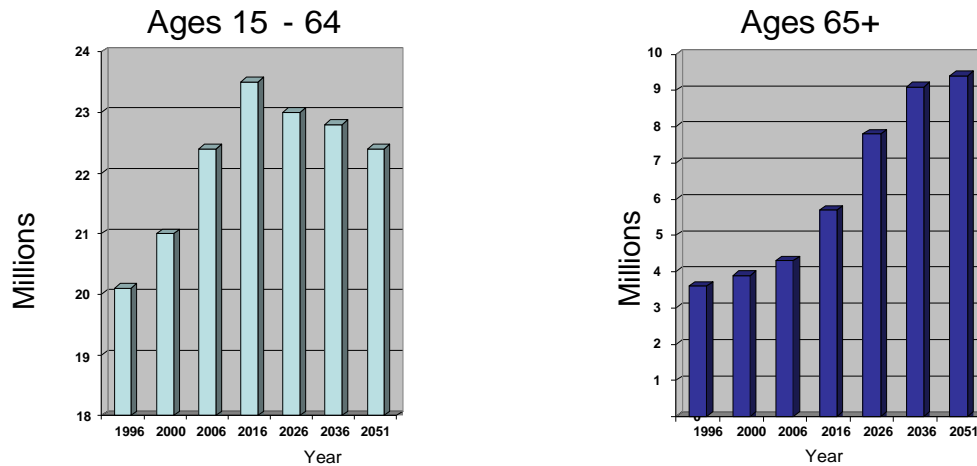
Prevalence of Cognitive Impairment



Demographics

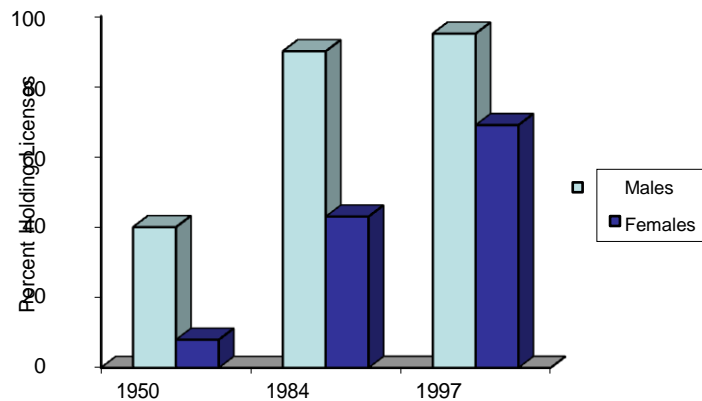
The number of people in Canada over the age of 65 increased from 3.5 million in 1996 to 4.2 million in 2006. By 2051, it is projected to be more than 9 million.

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%.

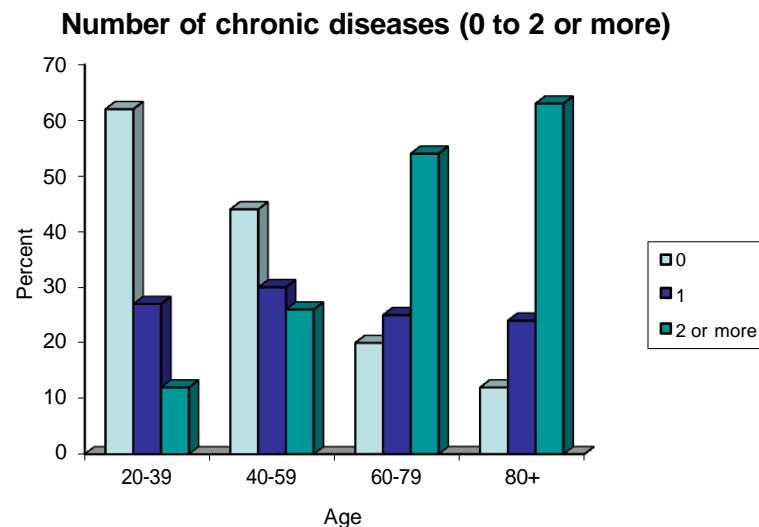


Source: Rosenbloom, 1998

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)

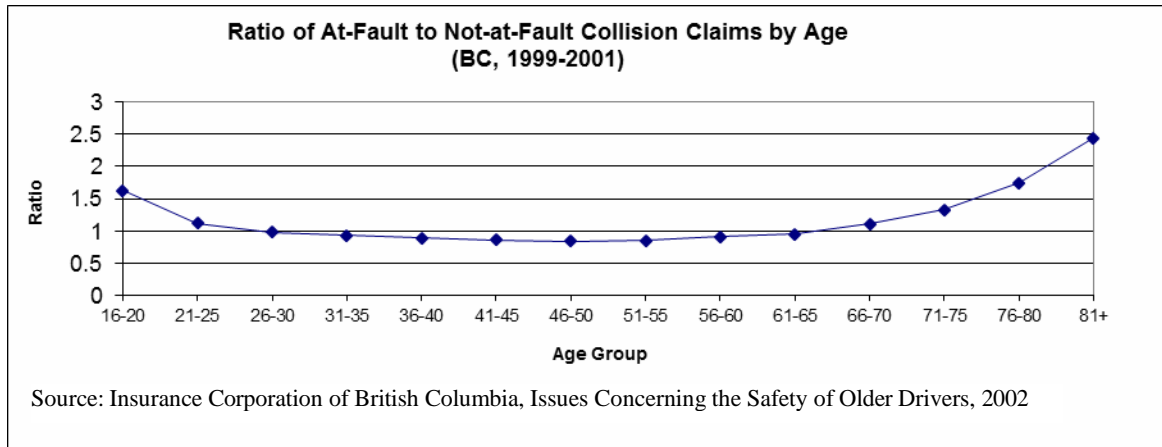
With an increased rate of multiple medical conditions, there is also a greater likelihood that aging drivers will be taking multiple medications (polypharmacy). With each additional medication taken, there is an increased risk of side effects and adverse interactions between medications, which may affect 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

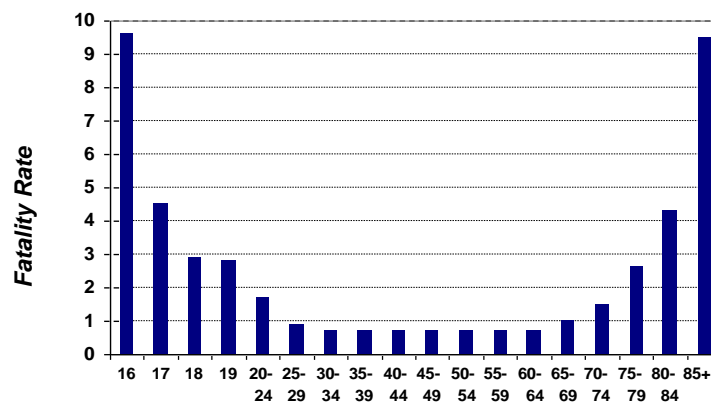
age 70, the ratio of at-fault crashes begins to rise, climbing to 2.5 for drivers who are 81 and older.



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)



Source: FARS 2001 and NHTSA 2001 *Driver Age Group*

Appendix 6: BC Specific Content

The following Medical Chapters have BC specific content different from the CCMTA Medical Standards and the 2010 BC Guide:

Chapter	Specific Sections	BC Specific Content Changes
Chapter 3: Cardiovascular Disease and Disorders	Sections 3.6.2; 3.6.3; 3.6.43 and 3.6.48.	➤ BC specific guidelines revised
	Sections 3.6.5; 3.6.6; 3.6.8; 3.6.41; 3.6.42	➤ References to DriveABLE removed
	Section 3.6.11	➤ Added BC guidelines not available in the 2010 BC Guide
	Sections: 3.6.12; 3.6.13; 3.6.14; 3.6.15; 3.6.28; 3.6.30; and 3.6.32	➤ BC specific content from 2010 BC Guide added which is aligned with the Canadian Cardiovascular Society (CCS) and is different from CCMTA's
Chapter 5: Chronic Renal Diseases	Sections 5.6.2 and 5.6.3	➤ BC specific guidelines revised and references to DriveABLE removed
Chapter 6: Cognitive Impairment including dementia	Sections 6.6.1 ; 6.6.2	➤ BC specific guidelines revised; Rationale added ; and references to DriveABLE removed
Chapter 7: Diabetes – Hypoglycemia	Sections 7.6.3 ; 7.6.4 ; 7.6.5; 7.6.7 and 7.6.8	➤ BC specific guidelines revised
	Section 7.6.3	➤ New 9.1A Process and Code W added
Chapter 8: Frailty, weakness or general debility	Section 8.6.1	➤ BC specific guidelines revised and references to DriveABLE removed
Chapter 9: Hearing Loss	Section 9.6.2	➤ BC specific guidelines retained for all types of commercial vehicles , Rationale added
Chapter 11: Musculoskeletal	Section 11.6.1	➤ BC guidelines revised

Chapter 13: Peripheral Vascular Diseases	Sections 13.6.2 and 13.6.3	➤ BC specific information required from health care providers revised
	Section 13.6.4	➤ BC specific guidelines revised
Chapter 15: Psychotropic Drugs and Driving	Section 15.6.1	➤ BC specific guidelines revised
	Sections 15.6.2; 15.6.3; and 15.6.4	➤ Added BC specific guidelines not available in the 2010 BC Guide
Chapter 16: Respiratory Diseases	Section 16.6.3 and 16.6.4	➤ BC specific guidelines revised ; and references to DriveABLE removed
Chapter 17: Seizures and Epilepsy	Section 17.6.4	➤ Added BC specific wait period
	Sections 17.6.7 and 17.6.8	➤ Adopted CCMTA's wait period different from the 2010 BC Guideline
	Sections 17.6.12 and 17.6.13	➤ Added BC specific guidelines not available in 2010 BC Guide
	Sections 17.6.11; and 17.6.12	➤ BC specific guidelines revised ➤ Added Code W
Chapter 18: Sleep Disorders	Section 18.6.1	➤ BC specific reassessment interval revised and added information required from physicians based on CCMTA's standard
Chapter 21: Vestibular disorders	Section 21.6.5	➤ BC specific guidelines revised and references to DriveABLE removed
Chapter 22: Vision impairments	Section 22.6.2 and 22.6.4	➤ BC specific guidelines retained for all types of commercial vehicles
	Sections 22.6.1 and 22.6.2	➤ BC Specific reassessment interval revised