

CCMTA • CCATM

CANADIAN COUNCIL OF MOTOR TRANSPORT ADMINISTRATORS
CONSEIL CANADIEN DES ADMINISTRATEURS EN TRANSPORT MOTORISÉ

CCMTA MEDICAL STANDARDS FOR DRIVERS

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CCMTA MEDICAL STANDARDS FOR DRIVERS

INTRODUCTION

The medical standards, or guidelines, proposed in this document were developed by medical advisors and administrators from Canadian provincial driver licensing bodies. Many of the standards are adopted from the Canadian Medical Association's Guide for Physicians in Determining Fitness to Drive, sixth edition. Where this is the case, a notation will appear with reference to the appropriate section of the CMA publication.

The standards are intended as a guide in establishing basic minimum medical qualifications. They can be utilized by both physicians and administrators in assessing an individual's ability to operate a motor vehicle.

Licence classes indicated are based on the classes as defined in the CCMTA Classified Driver Licensing System.

A contributing factor to the success of these medical standards is the commitment to cyclical review. The standards will therefore be reviewed on an on-going basis and updated accordingly so they can remain current and reflective of existing medical opinion.

VISION

Good visual function is essential for safe driving. Any significant loss of a visual function, such as visual acuity or visual field will diminish a person's ability to operate a motor vehicle safely on today's congested, high-speed roadways. A driver with a marked visual defect may fail to perceive a potentially dangerous situation altogether or see it too late to react appropriately. (CMA 11)

A detailed description of fitness to drive and vision is contained in Appendix 1.

1.1 Visual Acuity and Field

1.1.1 Visual Acuity

A driver's visual acuity must at least be such that he or she has time to detect and to react to obstacles, pedestrians, other vehicles and signs while moving at the maximum posted speed in daylight and in darkness. Greater levels of visual acuity are required for some classes to ensure public safety. Road signage should be designed to be easily legible at a safe distance for all individuals who meet the minimum visual acuity standard.

Class of Licence	Recommended standard
5 (Personal use) and 6	Not less than 6/15 (20/50) both eyes open and examined together.
4 (Taxi) and 5 (Commercial)	Not less than 6/12 (20/40) with both eyes open and examined together. Worse eyes not less than 6/60 (20/200).
1, 2, 3, 4 (Emergency)	Not less than 6/9 (20/30) with both eyes open and examined together. Worse eyes not less than 6/30 (20/100).

1.1.2 Visual Field Standards

An adequate continuous field of vision is important to safe driving. Any significant scotoma or restriction in the binocular visual field can make driving dangerous. If a visual field defect is suspected (based on medical condition, subjective report or confrontation field assessment), the patient should be referred to an ophthalmologist or optometrist for further testing.

Class of Licence	Recommended standard
5 (Personal use) and 6	120 continuous degrees along the horizontal meridian and 15 continuous degrees above and below fixation with both eyes open and examined together.
4 (Taxi) and 5 (Commercial)	120 continuous degrees along the horizontal meridian and 15 continuous degrees above and below fixation with both eyes open and examined together.
1, 2, 3, 4 (Emergency)	150 continuous degrees along the horizontal meridian and 20 continuous degrees above and below fixation with both eyes open examined together.

1.2 Colour Vision

Colour deficiency has not proven to be an important driving hazard however all drivers must should be able to discriminate between the different traffic lights.

STANDARD: OPERATORS OF ALL CLASSES OF VEHICLES MUST BE ABLE TO DISCRIMINATE BETWEEN THE DIFFERENT TRAFFIC LIGHTS.

1.3 Visual Field Defects

1.3.1 Scotoma

Central or peripheral scotomas must be taken into account when assessing visual field.

STANDARD: LICENSING TO BE BASED ON AN INDIVIDUAL ASSESSMENT BY AN OPHTHALMOLOGIST.

1.3.2 Hemianopsia and Quadrantic Field Defects

Horizontal visual fields should be tested using a standard apparatus, e.g. the Goldman 3.4e or an equivalent measuring procedure with a radius of 33 centimetres. The individual suffering from a complete homonymous hemianopsia should be prohibited from operating any motor vehicle. In the case of a partial quadrantic visual field defect, it is recommended the individual be required to provide a report of an ophthalmologist's assessment which describes the degree of impairment and indicates if the defect is in the inferior or superior quadrant. Those individuals subject to a partial quadrantanopsia may be eligible to operate any motor vehicle provided they satisfy the visual field standards for that class.

STANDARD: COMPLETE HOMONYMOUS OR BITEMPORAL HEMIANOPSIA - SUSPENDED FROM ALL DRIVING PRIVILEGES.

COMPLETE HOMONYMOUS OR BITEMPORAL INFERIOR QUADRANTANOPSIA - SUSPENDED FROM ALL DRIVING PRIVILEGES.

PARTIAL QUADRANTANOPSIA - MAY BE ELIGIBLE TO OPERATE ANY CLASS OF MOTOR VEHICLE PROVIDED THE INDIVIDUAL CAN SATISFY THE VISUAL FIELD STANDARDS FOR THAT CLASS.

1.4 Diplopia

Uncorrected diplopia is a contraindication to driving any class of motor vehicle (CMA 11.1.3). Provided the visual acuity and visual field standards can be met, it is agreed that diplopia which can be corrected through the use of a device to obscure one eye is not a contraindication for a class 5 or 6 driver licence after a minimum adjustment period of 3 months. The driver must then meet the standards applicable for monocular vision. If diplopia can be completely corrected by prescribed prisms, the individual may be eligible for any class of licence.

STANDARD: UNCORRECTED DIPLOPIA - MAY NOT OPERATE ANY MOTOR VEHICLE.

CORRECTED DIPLOPIA THROUGH A DEVICE TO OBSCURE ONE EYE - MAY BE ELIGIBLE FOR A CLASS 5 OR 6 LICENCE.

CORRECTED DIPLOPIA THROUGH PRESCRIBED PRISMS - MAY BE ELIGIBLE FOR ANY CLASS OF LICENCE.

1.5 Corrective Devices

New corrective devices are continually being developed to assist the visually impaired. As these devices become available they will need to be evaluated to determine if changes should be made to these recommendations. The use of corrective devices can be considered if the individual can meet the prescribed field and acuity standards.

1.5.1 Telescopic Lenses

All telescopic systems currently available cause visual field reduction. Individuals requiring the use of telescopic lenses should not be permitted to obtain or hold any class of driver licence.

STANDARD: NOT PERMITTED TO HOLD ANY CLASS OF LICENCE.

1.6 Laser Eye Surgery

The ability to drive after laser eye surgery may be impaired. Drivers are advised to follow the specific directions and guidelines as usually provided by the physician following surgery.

1.7 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) assessment by a specialist at a recognized rehabilitation or occupational therapy centre for driver training.

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.

HEARING

2.1 Recommended Hearing Standards

The effect of impaired hearing on driving is difficult to define. However, most hearing-impaired drivers are conscious of their impairment and compensate by being more cautious and alert and by making more use of their mirrors than drivers with normal hearing. (CMA 14)

In Classes 5 and 6, hearing loss should not constitute a barrier to driving ability. While the ability to hear or communicate is of paramount importance for the operator of a passenger bus, ambulance or other emergency vehicles (Classes 2 and 4), there are a number of factors which suggest it is inappropriate to apply that same requirement to the operator of a Class 1 or 3 motor vehicle. For example, high inside noise levels in truck cabs militate against hearing standards and may induce further hearing loss should an individual be compelled to use a hearing aid to meet the standard. In addition, in recognition of the prevalence of hearing loss among holders of Class 1 and 3 licences, manufacturers are now producing virtually soundproof cabs which eliminate outside noise thereby rendering hearing standards irrelevant.

Consequently, it is suggested that the holder of a Class 2 or 4 driver licence and the operators of emergency vehicles be required to have a hearing loss **no more** than 40 decibels **in the better ear** averaged at 500, 1000 and 2000 Hertz. Should the individual require the use of a hearing aid to attain the standard the licence issued should bear a notation such as "valid for Class # only when wearing a hearing aid". While it is agreed that a degree of hearing would be beneficial for all motor vehicle operators, in the absence of empirical data the totally deaf individual who is able to successfully complete the driving tests should be permitted to obtain or hold a Class 1, 3, 5 or 6 driver licence.

It is recommended that the applicant or holder of a Class 2 or 4 licence whose degree of hearing loss is at question be requested to file a report of an audiometric assessment.

It is also recommended that individuals who hold a Class 1, 3 or 5 licence and are engaged in the transportation of dangerous goods meet the medical requirements corresponding to Classes 2 and 4 as stated above.

Operators of emergency vehicles should also meet the hearing standards established for Classes 2 and 4. A special endorsement could be established in order to deal with emergency vehicle operators and transporters of dangerous goods.

STANDARD: NO HEARING STANDARD FOR CLASSES 1, 3, 5 AND 6 WITH THE EXCEPTION OF TRANSPORTERS OF DANGEROUS GOODS.

HEARING LOSS NO GREATER THAN 40 DECIBELS AVERAGED AT 500, 1000 AND 2000 Hz APPLIES TO CLASS 2 AND 4 LICENCES, OPERATORS OF EMERGENCY VEHICLES AND TRANSPORTERS OF DANGEROUS GOODS.

CARDIOVASCULAR DISEASES

NOTE: *This section is based on the 2003 report of the Canadian Cardiovascular Society (CCS) Consensus Conference on Assessment of the Cardiac Patient for Fitness to Drive and the CCS updated recommendations published in 2007 in the 7th Edition of the CMA publication: **Determining Medical Fitness to Operate Motor Vehicles.***

3.1 Cardiovascular Diseases and Driving

There is little conclusive statistical data about the importance of cardiovascular disease as a causative factor in motor vehicle accidents. However, a physician should be able to offer, based on clinical findings and the results of non-invasive testing, an opinion on the probability of sudden incapacitation significant enough to cause loss of control of a vehicle.

As with other conditions, the drivers of Class 1, 2, 3 or 4 vehicles are expected to meet higher standards because of the extra demands made of them, increased time behind the wheel, and the higher likelihood of a devastating accident with a large and/or passenger-carrying vehicle.

3.1.1 New York Heart Association Functional Classification

When considering an individual for a particular class of licence, reference should be made to the following NYHA functional classification:

The NYHA Functional Classification places patients in one of four categories based on how much they are limited during physical activity:

- I No symptoms and no limitation in ordinary physical activity.
- 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.

3.1.2 Treadmill-based Functional Classification

NOTE: In the previous edition of these guidelines, the CCS Functional classification was used and stress testing was required. This is no longer the case and a simple statement of functional class using the above definitions will suffice unless, in the physician's opinion, a treadmill test is necessary to determine functional class or is otherwise indicated.

3.1.3 Multiple Cardiac Conditions

Where two or more conditions co-exist, the more restrictive recommendation will prevail and the physician should consider the possibility of cumulative effect.

3.1.4 Clinical Judgement

These guidelines are intended to assist decision makers regarding the fitness of cardiac patients to drive, and are not intended to diminish the role of the physician's clinical judgment in individual cases.

3.1.5 Definitions

Waiting period: the time interval following onset of a disqualifying cardiac condition, initiation of a stable program of medical therapy, or performance of a therapeutic procedure (whichever is applicable) during which driving should generally be disallowed for medical reasons.

- Recurrence of the disqualifying condition or circumstance during this time resets the waiting period.
- If more than one waiting period would apply, the longer one should be used, except where stated otherwise.

Satisfactory control (for SVT, AF, or AFL which are associated with cerebral ischemia):

- Of SVT: successful radiofrequency ablation of the substrate, plus an appropriate waiting period or a 3 month waiting period on medical therapy with no recurrence of SVT associated with cerebral ischemia during this time.
- Of AF/AFL: a 3 month waiting period after appropriate treatment during which there have been no recurrences of symptoms associated with cerebral ischemia. If AF is treated with AV node ablation and pacemaker implantation, or if AFL is treated successfully with an isthmus ablation (with proven establishment of bidirectional isthmus block), then the appropriate waiting periods in Section 3.5.10 apply.
- Of sustained VT with an LVEF greater than or equal to 40% and no associated cerebral ischemia: successful ablation of the substrate plus a one week waiting period, or pharmacologic treatment plus the appropriate waiting period defined in Section 3.5.2.

Sustained ventricular tachycardia: Ventricular tachycardia having a cycle length or 500 msec or less and lasting 30 seconds or more or causing hemodynamic collapse.

Non-sustained ventricular tachycardia: Ventricular tachycardia ≥ 3 beats; having a cycle length of 500 msec or less and lasting less than 30 seconds; without hemodynamic collapse.

3.1.6 Follow Up

The following recommendations apply to follow-up of all drivers with cardiac conditions.

- As per specific guideline where exists, otherwise
- New condition – one year.
- Unstable condition – annually until stable.

- Stable* condition – by recommendation of the driver’s physician or the licensing authority.
 - Professional drivers (Class 1-4) at least every 5 years to age 45, every 3 years to age 65, then annually. (Current NSC requirement for medical review of all professional drivers.)
 - Reassessment should provide *evidence* that the driver meets the requirements set out in the guidelines.
- * Stable for this purpose means, “present for at least one year with negligible change and small likelihood of sudden deterioration”.

Standards for Specific Cardiac Conditions

3.2 Cardiac Inflammation and Infections

Individuals with acute pericarditis or myocarditis should not drive any type of motor vehicle until fully recovered. Applicants with subacute bacterial endocarditis should not drive any type of motor vehicle until completely well, because of the danger of embolism.

STANDARD: ELIGIBLE FOR ANY CLASS OF LICENCE ONCE FULLY RECOVERED.

3.3 Congenital Heart Defects

Individual assessment is required with the decision to licence based on functional capacity and the presence or absence of myocardial ischemia, cardiomyopathy, valvular heart disease and disturbance of cardiac rhythm. The relevant standards in the following section should be applied.

STANDARD: IN THE ABSENCE OF DISQUALIFYING COMPLICATIONS, ELIGIBLE FOR ANY CLASS OF LICENCE.

3.4 Coronary Artery Disease

3.4.1 General

All drivers with coronary artery disease should meet the following standards:

STANDARD	DL Class 5-8	DL Class 1-4
NYHA Class I	No restriction	No restriction
NYHA Class II		Disqualified
NYHA Class III		
* NYHA Class IV * Receiving intermittent outpatient or home inotropes * Left ventricular assist device	Disqualified	

3.4.2 Waiting Times:

STANDARD	Class 5-8	Class 1-4
1. Acute coronary syndromes		
ST elevation MI	1 month after discharge	3 months after discharge
Non-ST elevation MI with significant LV damage*	1 month after discharge	3 months after discharge
Non-ST elevation MI with minor LV damage*		
- 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
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
2. Stable coronary artery disease		
Stable angina Asymptomatic coronary artery disease	No restrictions	
PCI	48 hours after PCI	7 days after PCI
3. Cardiac surgery for coronary artery disease		
CABG surgery	1 month after discharge	3 months after discharge

NOTES:

- * Minor LV damage is classified as an MI defined only by elevated troponin \pm ECG changes and in the absence of a new wall motion abnormality. Significant LV damage is defined as any MI that is not classified as minor.

Notwithstanding any of the foregoing recommendations, angiographic demonstration of 50% or greater reduction in the diameter of the left main coronary artery should disqualify the patient from commercial driving, and 70% or greater should disqualify the patient for private driving, unless treated with revascularization.

Acronyms:

CAD: coronary artery disease;

LV: left ventricle;

MI: myocardial infarction

PCI: percutaneous coronary intervention

CABG: coronary artery bypass graft

3.5 Disturbances of Cardiac Rhythm

In general, a decision to licence an individual with a history of rhythm disorder will depend on the type of disorder, its frequency (if paroxysmal), whether or not the arrhythmia is associated with impairment (i.e. symptoms of cerebral ischemia) and whether or not satisfactory control (see “Definitions” above) has been achieved.

The general trend away from electrophysiology study (EPS) guided risk stratification and towards risk stratification based on left ventricular (LV) function is reflected in the new guidelines, since the majority of implantable cardioverter defibrillator (ICD) trials have identified LV function as one of the most important determinants of risk.

Acronyms:

AF: atrial fibrillation

AFL: atrial flutter

ATP: antitachycardia pacing

EPS: Electrophysiology Study

LVEF: left ventricular ejection fraction

NYHA: New York Heart Association

SVT: supraventricular tachycardia

VF: ventricular fibrillation

VT: ventricular tachycardia

3.5.1 Premature Atrial or Ventricular Contractions

STANDARD: ELIGIBLE FOR ANY CLASS OF LICENCE PROVIDED THERE ARE NO SYMPTOMS OF CEREBRAL ISCHEMIA AND NO OTHER DISQUALIFYING CARDIAC CONDITION.

3.5.2. Ventricular Arrhythmias

STANDARD	Class 5-8	Class 1-4
VF (no reversible cause) Hemodynamically unstable VT	6 months after event	Disqualified
VT or VF due to a reversible cause*	No driving until/unless successful treatment of underlying condition	
Sustained VT with no associated impairment of consciousness; LVEF < 35%	3 months after event	Disqualified
Sustained VT with no impairment of consciousness; LVEF ≥ 35%; ICD has not been recommended	4 weeks after event Satisfactory control (See 3.1.5)	3 months after event Satisfactory control (See 3.1.5)
Non-sustained VT with no associated impairment of consciousness	No restriction	

* Examples include, but are not limited to, VF within 24 hours of myocardial infarction, VF during coronary angiography, VF with electrocution, VF secondary to drug toxicity. Reversible cause VF recommendations overrule the VF recommendations if the reversible cause is treated successfully and the VF does not recur

3.5.3 Paroxysmal SVT, AF or AFL

STANDARD	Class 5-8	Class 1-4
With impaired level of consciousness	Satisfactory control (See 3.1.5)	
Without impaired level of consciousness	No restriction	

Drivers should receive chronic anticoagulation if clinically indicated (AF/AFL)
SVT: supraventricular tachycardia; AF: atrial fibrillation; AFL: atrial flutter

3.5.4. Persistent or Permanent AF or AFL

STANDARD	Class 5-8	Class 1-4
Adequate ventricular rate control; no impaired level of consciousness	No restriction	

Drivers should receive chronic anticoagulation if clinically indicated (AF/AFL)
AF: atrial fibrillation; AFL: atrial flutter

3.5.5. Sinus Node Dysfunction

STANDARD	Class 5-8	Class 1-4
No associated symptoms	No restriction	
Associated symptoms (sick sinus syndrome)	Disqualified until successful treatment (See 3.1.5)	

3.5.6 Atrioventricular (AV) and Intraventricular Block

STANDARD	Class 5-8	Class 1-4
Isolated first degree AV block	No restriction	
Isolated right bundle branch block (RBBB)		
Isolated left anterior fascicular block		
Isolated left posterior fascicular block		
Left bundle branch block (LBBB)	Fit to drive if no associated impairment of level of consciousness	Fit to drive if no associated impairment of level of consciousness; and no higher grade AV block on an annual 24 hour Holter
Bifascicular block		
Second degree AV block; Mobitz I		
First degree AV block + bifascicular block		
Second degree AV block; Mobitz II (distal AV block)	Disqualified	
Alternating LBBB and RBBB		
Acquired third degree AV block		
Congenital third degree AV block	Fit to drive if no associated impairment of level of consciousness	Fit to drive if no associated impairment of level of consciousness; QRS duration ≤ 110 msec; and no documented pauses ≥ 3 seconds on an annual 24 hour Holter

If a permanent pacemaker is implanted, the recommendations in Section 3.5.7 (below) prevail

3.5.7 Permanent Pacemakers

STANDARD	Class 5-8	Class 1-4
All patients	<ul style="list-style-type: none"> * Waiting period 1 week after implant * No impaired level of consciousness after implant * Normal sensing and capture on ECG * No evidence of pacemaker malfunction at regular pacemaker clinic checks 	<ul style="list-style-type: none"> * Waiting period 1 month after implant * No impaired level of consciousness after implant * Normal sensing and capture on ECG * No evidence of pacemaker malfunction at regular pacemaker clinic checks

3.5.8. Implantable Cardioverter Defibrillators (ICDs)

STANDARD	Class 5-8	Class 1-4
Primary prophylaxis, NYHA Class I-III	4 weeks after implant	Disqualified†
A primary prophylaxis ICD has been recommended but declined by the patient	No restriction	
Secondary prophylaxis for VF or VT with decreased level of consciousness; NYHA Class I-III	6 months after event*	
Secondary prophylaxis for sustained VT with no associated cerebral ischemia; NYHA Class I - III	1 week post implant, in addition to the appropriate waiting period for the VT	
Any event resulting in device therapies being delivered (shock or ATP), in which level of consciousness was impaired, or the therapy(ies) delivered by the device was/were disabling	Additional 6 month restriction	

* The 6 month period begins not at the time of ICD implant, but rather at the time of the last documented episode of sustained symptomatic VT, or syncope judged to be likely due to VT or cardiac arrest.

Note: For patients who have a bradycardia indication for pacing as well, the additional criteria under Section 3.5.7 also apply.

All patients must be followed from a technical standpoint in a device clinic with appropriate expertise.

† ICDs may sometimes be implanted in low risk patients. Individual cases may be made for allowing a commercial driver (Class 1-4) to continue driving with an ICD provided the annual risk of sudden incapacitation is felt to be 1% or less

3.5.9 Carotid Sinus Hypersensitivity

An individual with symptoms of cerebral ischemia resulting from carotid sinus stimulation cannot drive any vehicle safely unless the symptoms are controlled medically or with a pacemaker.

STANDARD: ELIGIBLE FOR ANY CLASS OF LICENCE ONCE SYMPTOMS ARE CONTROLLED.

3.5.10. Other

STANDARD	Class 5-8	Class 1-4
Brugada's syndrome; Long QT syndrome; Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC)	*Appropriate investigation and treatment guided by a cardiologist *6 months after any event causing impaired level of consciousness	Disqualified †
* Catheter ablation procedure * EPS with no inducible sustained ventricular arrhythmias	48 hours after discharge	1 week after discharge

Acronyms: *VF*: ventricular fibrillation; *VT*: ventricular tachycardia; *EPS*: electrophysiology study; *SVT*: supraventricular tachycardia; *AF*: atrial fibrillation; *AFL*: atrial flutter; *ECG*: electrocardiogram; *ATP*: antitachycardia pacing

**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 (Class 1-4) 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 Valvular Heart Disease

Determination of fitness to drive in individuals with unoperated valvular heart disease must be based on the degree of functional impairment, presence or absence of cerebral ischemia and, for commercial drivers, a favourable detailed cardiologic assessment.

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, and therefore must be thoroughly assessed before being permitted to drive Class 1, 2, 3, 4 vehicles.

3.6.1 Medically Treated Valvular Heart Disease

STANDARD	Class 5-8	Class 1-4
Aortic stenosis and sclerosis	* NYHA Class I or II * No episodes of impaired level of consciousness	* Asymptomatic * NYHA Class I * AVA \geq 1.0 cm ² * EF \geq 35% *Annual Follow-up
* Aortic regurgitation * Mitral stenosis * Mitral regurgitation	* No episodes of impaired level of consciousness * NYHA Class I or II	* No episodes of impaired level of consciousness * NYHA Class I * EF \geq 35%

3.6.2 Surgically treated valvular heart disease

STANDARD	Class 5-8	Class 1-4
*Mechanical prostheses * Mitral bioprostheses with non-sinus rhythm * Mitral valve repair with non-sinus rhythm	* 6 weeks after discharge * No thromboembolic complications on anticoagulant therapy	* 3 months after discharge * No thromboembolic complications * Anticoagulant therapy * NYHA Class I * EF > 35%
* Aortic bioprostheses * Mitral bioprostheses with sinus rhythm * Mitral valve repair with sinus rhythm	* 6 weeks after discharge * No thromboembolic complications	* 3 months after discharge * No thromboembolic complications * NYHA Class I * EF > 35%

Acronyms: NYHA : New York Heart Association; AVA: Aortic valve area; LV: left ventricle; NSVT: nonsustained ventricular

3.6.3 Mitral Valve Prolapse

Individuals who are asymptomatic may be considered for any class of licence. Those who are symptomatic should be assessed for arrhythmia by ambulatory ECG recording before being considered for commercial licences.

STANDARD: ELIGIBLE FOR ANY CLASS OF LICENCE IF ASYMPTOMATIC. IF SYMPTOMATIC, MUST MEET THE APPROPRIATE ARRHYTHMIA STANDARDS (SECTION 3.5).

3.7 Congestive Heart Failure, Left Ventricular Dysfunction, Cardiomyopathy, Transplantation

STANDARD	Class 5-8	Class 1-4
NYHA Class I	No restriction	EF \geq 35%
NYHA Class II		
NYHA Class III		Disqualified
* NYHA Class IV * Receiving intermittent outpatient or home inotropes * Left ventricular assist device	Disqualified	
Heart transplant	* 6 weeks after discharge * NYHA Class I or II * On stable immunotherapy * Annual reassessment	* 6 months after discharge * Annual assessment * EF \geq 35% * NYHA Class I * Annual non-invasive test of ischemic burden showing no evidence of active ischemia

Acronyms: *LV*: Left ventricle; *NSVT*: nonsustained ventricular tachycardia;
EF: ejection fraction

3.8 Hypertrophic Cardiomyopathy

STANDARD	Class 5-8	Class 1-4
All patients	* No episodes of impaired level of consciousness	* LV wall thickness < 30 mm * No history of syncope * No NSVT on annual Holter * No family history of sudden death at a young age * No BP decrease with exercise

Acronyms: *BP*: blood pressure; *LV*: Left ventricle;
NSVT: nonsustained ventricular tachycardia

3.9 Syncope

STANDARD	Class 5-8	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 Section 3.5	

* 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*

It should be noted that, despite an apparent contradiction with the content of the syncope article in the Neurological section, there is, in fact, no contradiction. The syncope due to a cardiac problem is to be handled according to this chart while a neurological syncope is to be handled according to the neurological section.

3.10 Hypertension

Hypertension, other than uncontrollable malignant hypertension, is not in itself a contraindication to operating any type of motor vehicle, but associated complications such as damage to heart, eyes, kidneys and brain may well preclude safe driving. Persistent hypertension above 170/110 mm Hg is frequently accompanied by complications that may make driving dangerous: persons with a blood pressure in this range must be examined very carefully. If the eyes are found to be affected, the degree of impairment of driving ability will depend upon the loss of vision.

If the hypertension has caused cardiac damage resulting in congestive failure or cerebral impairment, this should be the principal consideration in evaluating the ability of the applicant to drive safely. If the blood pressure is found to be 170/110 mm Hg or higher in applicants for a Class 1, 2, 3 or 4 licence, evaluation should include fundoscopic examination, electrocardiogram, chest X-ray and serum creatinine measurement, and referral to an internist for an opinion if a marked deviation from normal is found.

STANDARD: IF HYPERTENSION IS SUSTAINED AT 170/110 MM HG OR HIGHER, A DETAILED EVALUATION BY A PHYSICIAN IS REQUIRED.

A SATISFACTORY REPORT CONCERNING THE MANAGEMENT OF THE CONDITION SHOULD BE SUBMITTED FOR THE APPLICANT TO OBTAIN OR CONTINUE TO HOLD A CLASS 1, 2, 3 OR 4 LICENCE.

CEREBROVASCULAR DISEASES

4.1 Cerebrovascular Insufficiency

Cerebrovascular insufficiency may cause disabilities that are very hard to detect. Fortunately, the onset of these disabilities is usually gradual and seldom leads to a sudden loss of control at the wheel. If the physician suspects a problem, a detailed history and careful evaluation of the degree of disability present is probably the best method of determining fitness to drive. (CMA 9)

4.2 Cerebrovascular Accidents Including Transient Ischemic Attacks

4.2.1 Transient Ischemic Attacks

A patient who has experienced either a single TIA or recurrent TIA's should not be allowed to drive any class of motor vehicle until a complete neurological assessment has been conducted. Driving may be resumed if the neurologic assessment shows no residual loss of functional ability, to include motor function and cognitive ability, discloses no obvious risk of sudden re-occurrence and any underlying cause has been addressed with appropriate treatment

STANDARD: INDIVIDUAL SUBJECT TO A SINGLE OR RECURRING TIA'S SHOULD NOT BE PERMITTED TO DRIVE UNTIL A COMPLETE NEUROLOGIC ASSESSMENT HAS DISCLOSED NO RESIDUAL LOSS OF FUNCTIONAL ABILITY

4.2.2 Strokes

Individuals who have suffered a single episode of cerebrovascular hemorrhage or cerebral infarction that has resulted in temporary loss of coordination or motor power should not drive for at least one month. They may be allowed to operate any motor vehicle after the one month waiting period provided there has been a good recovery, the condition has stabilized and there are no signs of impending recurrence and a neurological assessment indicates that they are functionally able. Particular care must be taken to ensure that there are no changes in personality, alertness or decision-making ability. It is suggested the individual should be required to file a report of a neurologist's assessment detailing the medical status before being allowed to resume motor vehicle operation. Where there is reported to be a residual loss of motor power a road test is recommended and should be mandatory for Classes 1, 2, 3 and 4. The individual allowed to hold a Class 1, 2, 3 or 4 should be subject to frequent (at least annual) medical follow-ups. The individual who may not be able to hold a Class 1, 2, 3 or 4 licence may be considered for a Class 5 or 6 licence following medical review and driving re-examination.

Patients who have had a stroke should not drive for at least 1 month.

STANDARD: INDIVIDUAL SUBJECT TO A SINGLE OR RECURRING TIA'S SHOULD NOT BE PERMITTED TO DRIVE UNTIL A COMPLETE NEUROLOGIC ASSESSMENT HAS DISCLOSED NO RESIDUAL LOSS OF FUNCTIONAL ABILITY.

INDIVIDUAL WHO HAS SUFFERED A CVA MAY OPERATE ANY MOTOR VEHICLE IF A COMPLETE NEUROLOGIC ASSESSMENT HAS DISCLOSED NO RESIDUAL LOSS OF FUNCTIONAL ABILITY.

OPERATORS OF ANY CLASS MAY BE REQUIRED TO COMPLETE A ROAD TEST AND CONSENT TO AN ANNUAL MEDICAL FOLLOW-UP IN CASE OF RESIDUAL DEFECT.

4.3 Cerebral Aneurysm

Symptomatic cerebral aneurysms that have not been surgically repaired are an absolute barrier to driving any class of motor vehicle. following successful treatment, the patient may drive a class 5 vehicle after a symptom-free period of 3 months. The patient may be eligible to drive Class 1, 2, 3 or 4 after being symptom free for 6 months.

For an asymptomatic, incidentally discovered aneurysm the driver may be eligible for any class of licensure upon receipt of a favourable opinion from a neurologist/neurosurgeon

STANDARD: PATIENTS WHO HAVE EXPERIENCED A CEREBRAL ANEURYSM:

PATIENT CONDITION	CLASS 5 OR 6	CLASS 1, 2, 3 OR 4
UNTREATED CEREBRAL ANEURYSMS	ABSOLUTE BARRIER TO DRIVING ANY CLASS OF VEHICLE	ABSOLUTE BARRIER TO DRIVING ANY CLASS OF VEHICLE
AFTER SURGICAL TREATMENT	WAITING PERIOD 3 MONTHS	WAITING PERIOD 6 MONTHS

VASCULAR DISEASES

5.1 Aortic Aneurysm

While the risk of sudden incapacitation due to the rupture of an unresected aortic aneurysm is minimal, it is suggested that when the holder of any driver licence is reported to be suffering from an aortic aneurysm a vascular surgeon's assessment is required. If surgery has been performed and a satisfactory recovery has been made the individual should be permitted to apply for or retain any class of licence.

With respect to Abdominal Aortic Aneurysm:

Condition	Class 5,6	Classes 1, 2, 3 and 4
Aneurysm is equal to or greater than 5.5cm.	May be issued	Should <u>not</u> be issued
Aneurysm is equal to or greater than 6.5 cm.	Should <u>not</u> be issued	Should <u>not</u> be issued

STANDARD*: LICENSING WILL BE BASED ON AN ASSESSMENT EVERY 6 TO 12 MONTHS DEPENDING UPON RATE OF GROWTH AND A FAVOURABLE RECOMMENDATION FROM A VASCULAR SURGEON.

5.2 Peripheral Arterial Vascular Disease

Arteriosclerotic occlusion, Raynaud's phenomenon, Buerger's disease and scleroderma, if sufficiently severe to cause claudication, require evaluation. An individual with any of these conditions should be monitored and reviewed regularly and subsequently the ability to hold driving privileges should be considered. If the condition is successfully treated, the individual may be permitted to operate any class of vehicle.

STANDARD: MAY OPERATE ANY CLASS OF VEHICLE IF CONDITION IS TREATED SUCCESSFULLY.

5.3 Diseases of the Veins

Individuals with deep venous thrombosis (DVT) can drive any type of motor vehicle safely if appropriately treated with an anticoagulant and provided a favourable recommendation from a physician.

STANDARD: INDIVIDUALS WITH DVT MAY OPERATE ANY CLASS OF MOTOR VEHICLE PROVIDED APPROPRIATE TREATMENT WITH AN ANTICOAGULANT AND A FAVOURABLE RECOMMENDATION FROM A PHYSICIAN.

DISEASES OF THE NERVOUS SYSTEM

6.1 The Nervous System and Driving

A driver must be able to perform many complex movements quickly and precisely to operate a motor vehicle under extremes of weather and in today's traffic conditions. This requires an adequate level of intelligence and consciousness, good control of muscular movements, a good sense of balance and freedom from the distraction of severe pain. (CMA 5)

6.2 Syncope (Unexpected Loss of Consciousness or Awareness)

Individuals subject to loss of consciousness due to Stokes-Adams attacks or other cardiac arrhythmias may not be considered for any class of licence until the underlying cardiac condition has been corrected, and should be reviewed after one year. The individual with a single unexplained episode of loss of consciousness or awareness may be allowed to operate any motor vehicle provided the individual is investigated and the condition felt to be benign. The person who has suffered more than one syncopal episode should not operate any motor vehicle until the cause of the episodes has been determined and successful corrective measures taken. A history of vasovagal syncope in adolescents is not felt to constitute a driving hazard.

STANDARD: SINGLE UNEXPLAINED EPISODE - MAY OPERATE A CLASS 5 OR 6 VEHICLE AFTER 1 MONTH OR A CLASS 1, 2, 3 OR 4 VEHICLE AFTER 3 MONTHS PROVIDED THERE IS NO OBVIOUS CARDIAC OR NEUROLOGIC CAUSE.

RECURRENT EPISODES (I.E. TWO OR MORE EPISODES WITHIN 12 MONTHS) - MAY OPERATE A CLASS 5 OR 6 VEHICLE AFTER 3 MONTHS AND A CLASS 1, 2, 3 OR 4 VEHICLE AFTER 12 MONTHS PROVIDED THERE IS NO OBVIOUS CARDIAC OR NEUROLOGIC CAUSE.

6.3 Seizures

6.3.1. Epilepsy

It is felt a history of febrile convulsions limited to early childhood may be ignored.

The individual with a past history of epileptic seizures should generally not hold any licence other than Class 5 or 6, and then only if he/she satisfies the following criteria:

- a) whether the physician believes the individual is being truthful about the frequency of seizures;
- b) whether the physician believes the individual to be a conscientious patient who will take medication in the manner prescribed and follow all the physician's instructions carefully;
- c) whether the applicant is under regular medical supervision so that the physician will at once become aware of any further seizure;
- d) whether the seizures appear to have been prevented by medication.

An applicant should be required to sign a statement which specifies that it is an offence to make a false declaration.

An applicant who meets all these criteria and who has been free from seizures for six months can usually operate a Class 5 or 6 motor vehicle safely, provided the medication prescribed does not cause significant side effects that would impair driving. This will require a favourable recommendation from the treating physician.

A patient who has been seizure-free on medication for 1 year and whose seizures have recurred after medication was stopped for a trial period on the physician's instructions may drive after resuming medication. A patient who stops taking antiseizure medication against the physician's advice should not be allowed to drive until the physician feels confident that he or she has resumed regular drug therapy and will conscientiously follow advice in the future. (CMA 5.4)

If the individual has been seizure free on or off medication for 5 years, he/she may be considered for any class of licence.

STANDARD: IF INDIVIDUAL HAS BEEN SEIZURE-FREE ON OR OFF MEDICATION FOR 5 YEARS, AND RECEIVES A FAVOURABLE REPORT FROM THEIR USUAL TREATING PHYSICIAN AND / OR A NEUROLOGIST, MAY OPERATE ANY CLASS OF MOTOR VEHICLE.

6.3.2 Solitary Seizure

The individual who has suffered a single unprovoked seizure should not be considered for any class of motor vehicle until a detailed neurological assessment and EEG have been performed and are satisfactory. The individual whose seizure cannot directly be related to a toxic illness can continue to drive safely provided full neurologic assessment is normal and EEG reveals no epileptiform activity.

Where the EEG shows signs of epileptiform activity, the patient should not be allowed to drive for a period of 6 months. An earlier reinstatement may be considered on a favourable recommendation from a neurologist

The individual may be considered for a classified (1-4) licence after 12 months if the EEG is normal and there has been no recurrence of seizure.

STANDARD: NOT ELIGIBLE FOR ANY CLASS OF LICENCE UNTIL A COMPLETE NEUROLOGICAL ASSESSMENT HAS BEEN CONDUCTED.

MAY BE CONSIDERED FOR A HIGHER (1-4) CLASS OF LICENCE IF THERE ARE NO SIGNS OF EPILEPTIFORM ACTIVITY AND INDIVIDUAL HAS BEEN SEIZURE-FREE FOR 12 MONTHS.

6.3.3 Seizures Associated with Trauma or Intracranial Lesions

Non epileptic seizures caused by cranial trauma or intracranial lesions will be evaluated on an individual basis. Once the underlying cause has been resolved, neurological assessment of functional or cognitive sequelae will determine fitness to drive.

6.3.4 Seizure During Sleep and on Awakening

The individual with a history of seizures solely when asleep or immediately after awakening may be considered for a Class 5 or 6 licence provided he has satisfactory waking EEG's and is subject to regular medical review. He may be eligible for a Class 1, 2, 3 or 4 licence if free of seizures for five years, whether on or off medication.

STANDARD: ELIGIBLE FOR A CLASS 5 OR 6 LICENCE IF WAKING EEG IS NORMAL.

ELIGIBLE FOR A CLASS 1, 2, 3 OR 4 LICENCE IF INDIVIDUAL HAS BEEN FREE OF SEIZURES FOR FIVE YEARS, ON OR OFF MEDICATION.

6.3.5 Simple Partial Seizure

An individual who has had only focal epileptic seizures involving a single limb with no impairment of consciousness may hold a Class 1, 2, 3 or 4 licence if the first seizure occurred more than three years previously. Such an individual may be considered for a Class 5 or 6 licence following a complete neurological assessment.

STANDARD: ELIGIBLE FOR A CLASS 5 OR 6 LICENCE FOLLOWING A SATISFACTORY NEUROLOGICAL ASSESSMENT.

ELIGIBLE FOR A CLASS 1, 2, 3 OR 4 LICENCE AFTER THREE YEARS IF NO GENERALIZED SEIZURES OR IMPAIRMENT OF CONSCIOUSNESS DURING EPISODES ARE EXPERIENCED.

6.3.6 Alcohol and Seizures

The decision to licence based on seizures that occur exclusively in the context of alcohol withdrawal should be based on the severity of alcohol abuse/dependence. If, after a thorough neurological examination no neurological abnormality is found, the patient should be referred to and assessed by an addictions specialist recognized by the licensing authority or a physician familiar with their medical history.

6.4 Sleep Disorders

6.4.1 Narcolepsy

Patients who suffer attacks of narcolepsy should generally not be allowed to drive any type of motor vehicle. If they respond favourably to treatment and are experiencing no side effects from medication, they may drive Class 5 or 6 vehicles after 3 months. However, they should not be allowed to hold a Class 1, 2, 3 or 4 licence. (CMA 6.4)

STANDARD: IF CONDITION IS CONTROLLED FOR A THREE MONTH PERIOD, INDIVIDUAL IS ELIGIBLE TO OPERATE A PRIVATE MOTOR VEHICLE.

INDIVIDUAL IS NOT ELIGIBLE TO OPERATE A CLASS 1, 2, 3 OR 4 MOTOR VEHICLE.**6.4.2 Obstructive Sleep Apnea (OSA)**

Sleep disorders may cause daytime drowsiness and reduced concentration that are symptoms that can negatively affect driving safely. Obstructive sleep apnea (OSA) is 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.

All commercial drivers must file periodic mandatory medical reports to assess their fitness to hold Class 1, 2, 3 and 4 driver licences. For Class 5 and 6 licences, drivers are assessed for fitness to drive on a case by case basis, taking into account the treating physicians specific recommendations.

During their periodic medical assessment it is essential the examining physician screen for sleep disorders risk factors. OSA indicators include:

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 history of OSA

Conditions associated with OSA

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

Patients with severe obstructive sleep apnea, 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 (CMA 8.3). 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.

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.

The licensing agency's medical reporting form for class 1, 2 3 or 4 permits should include specific questions on OSA and OSA symptoms such as daytime drowsiness.

Sleep disorders may also interfere with driving private vehicles safely. Such drivers should be counselled to not drive long distances or for long periods without frequent breaks unless they have been treated and the treatment has successfully resolved the sleep disorder symptoms.

Apnea-hypopnea index, or AHI, is an index used to assess the severity of sleep apnea based on the total number of complete cessations (apnea) and partial obstructions (hypopnea) of breathing occurring per hour of sleep. These pauses in breathing must last for 10 seconds and are associated with a decrease in oxygenation of the blood. In general, the AHI can be used to classify the severity of disease (mild 5-15, moderate 15-30, and severe greater than 30).

Treatment of obstructive sleep apnea is considered successful when daytime drowsiness is no longer present.

STANDARD: MAY OPERATE ANY CLASS OF VEHICLE UNDER THE FOLLOWING CONDITIONS:

- **HAS UNTREATED OBSTRUCTIVE SLEEP APNEA WITH AN AHI \leq 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**

6.4.3 Other Sleep Disorders

Patients with conditions that chronically interfere with sleep are at increased risk of an accident or injury while driving because of daytime sleepiness. Patients with a history of pathologic daytime sleepiness should be referred to a consultant for further assessment. If their condition is severe enough to impair driving ability, they should not be allowed to drive any class of motor vehicle until the condition has been adequately treated and controlled.

STANDARD: MAY OPERATE ANY CLASS OF VEHICLE AFTER THE CONDITION HAS BEEN ADEQUATELY TREATED AND CONTROLLED, SUBJECT TO CONTINUED MEDICAL SURVEILLANCE.

6.5 Vestibular Disorders

Driving ability is affected by any defect of balance and is therefore dependent on the normal functioning of the vestibular mechanism.

Individuals with acute vertigo should be advised not to drive any type of vehicle until the condition has subsided or responded to treatment.

Persons who are subject to recurrent attacks of vertigo that occur without warning cannot safely operate any type of motor vehicle until it is certain that the attacks of vertigo have been controlled.

STANDARD: INDIVIDUALS WITH TRUE VERTIGO SHOULD NOT DRIVE ANY TYPE OF VEHICLE UNTIL THE DISORDER IS CONTROLLED OR HAS SUBSIDED.

6.6 Disorders of Coordination and Muscle Control

The ability to maintain posture and to coordinate movements of the head and limbs is essential for safe driving. Lack of coordination and poor muscle control occur in a wide variety of disorders, each posing a special problem. Included in this group of diseases are such conditions as paralysis due to poliomyelitis, Parkinson's disease, multiple sclerosis, cerebral palsy, muscular dystrophy, motor neuron diseases, myasthenia gravis, tumours of the brain and spinal cord, organic brain damage following a head injury and many others.

In the more serious of these disorders, it will be immediately obvious that the applicant is unable to drive a motor vehicle safely. In the early stages of some of these conditions no restriction need be placed on the applicant, and if the disorder is not progressive one examination will usually suffice. However, if the disease is usually slowly progressive, the applicant must be re-examined at regular intervals and driving discontinued when the disability reaches a point that makes driving unsafe. If any of these conditions are also accompanied by slowing of thought process, impairment of memory, judgement or behaviour, or are liable to lead to loss of consciousness, the applicant cannot, of course, safely drive any type of motor vehicle.

It is possible for an applicant with a mild or partial loss of muscle control to have mechanical appliances added to a car that will permit safe driving of a Class 5 or 6 vehicle. After the appliance has been installed, the applicant must also satisfy the driver examiner as to his ability to drive safely.

STANDARD: EVALUATED ON AN INDIVIDUAL BASIS; DEGREE AND SEVERITY OF DISABILITY DETERMINES INDIVIDUAL'S ELIGIBILITY TO OPERATE ANY MOTOR VEHICLE.

IF MECHANICAL APPLIANCES ARE INSTALLED IN THE VEHICLE, APPLICANT MUST DEMONSTRATE ABILITY IN A DRIVING TEST.

6.7 Mental Deficiency and Retardation

Before being allowed to obtain any class of driver licence, individuals with reported or admitted mental deficiencies should be requested to submit a medical report including reference to the person's mental capacity and judgement ability. If allowed to obtain a driver licence these individuals should have their operating records monitored for evidence of improper driving behaviour.

STANDARD: MEDICAL REPORT MUST BE SUBMITTED WHEN INDIVIDUAL APPLYING FOR ANY CLASS OF LICENCE.

6.8 Dementia

Dementia is a clinical term describing what is usually a progressive and irreversible impairment of memory, intellect, and personality and is most commonly due to degenerative cerebral disease or multiple strokes. Dementia must be differentiated from conditions causing cognitive impairment

which are treatable, reversible, or non-progressive. Factors in determining degree of Dementia include:

Some Memory Impairment but Dementia Not Definitely Diagnosed	Mild Dementia	Moderate Dementia	Severe Dementia
<ul style="list-style-type: none"> - forgets name, location of objects - may have trouble finding words - may have difficulty traveling to new locations - may have difficulty with problems at work 	<ul style="list-style-type: none"> - Has difficulty with complex tasks or instrumental activities of daily living (eg finances, shopping, planning dinner, cooking, taking medication, telephoning etc.) 	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - Decreased ability to use toilet and is incontinent - Vocabulary limited - Loses ability to walk and sit - Unable to smile

There is no single clinical test or measurement which correlates with the ability of an individual with dementia to safely operate a motor vehicle. There is, however, a general correlation between driving ability and degree of functional impairment. The driver with evidence of memory impairment (dementia may not have yet been definitely diagnosed) or with mild dementia (defined as having difficulty with complex tasks such as managing finances, shopping, taking medication, cooking) **may** be able to drive a private vehicle. This is best determined by performing a professional assessment of driving ability. Such drivers should be reassessed annually because of the progressive nature of most dementing illnesses.

Once an individual has progressed to moderate dementia (difficulty with basic activities of daily living such as eating, dressing, and hygiene, OR severe cognitive impairment on formal testing such as MMSE score < 15), the degree of cognitive impairment is sufficient to preclude safe operation of any motor vehicle.

STANDARD: MEMORY IMPAIRMENT OR MILD DEMENTIA – ELIGIBLE FOR CLASS 5 LICENCE, SUBJECT TO SATISFACTORY DRIVING ASSESSMENT. ANNUAL REASSESSMENT IS RECOMMENDED.

MODERATE OR SEVERE DEMENTIA – INELIGIBLE FOR ANY CLASS OF LICENCE

6.9 Head Injury

The individual with a history of significant injury with loss of consciousness should be subject to thorough medical review including assessments of cognitive and motor functions before being allowed to operate a motor vehicle.

STANDARD: EVALUATED ON AN INDIVIDUAL BASIS; DEGREE AND SEVERITY OF DISABILITY DETERMINES INDIVIDUAL'S ELIGIBILITY TO OPERATE ANY MOTOR VEHICLE.

COGNITIVE AND MOTOR FUNCTIONS TO BE DETERMINED WHEN CONSIDERING ANY CLASS OF LICENCE.

6.10 Intracranial Tumour

The individual who has made a good recovery following surgery may be allowed to operate a Class 5 or 6 motor vehicle after an appropriate recovery period and with a detailed assessment from a neurologist or neurosurgeon including reference to the nature and extent of the tumour, the likelihood of recurrence and any indication of residual deficits.

STANDARD: FOLLOWING SURGERY, RECOVERY PERIOD AND A NEUROLOGIST'S ASSESSMENT, MAY OPERATE A CLASS 5 OR 6 MOTOR VEHICLE.

A HIGHER CLASS OF LICENCE MAY BE GRANTED FOLLOWING REMOVAL OF A TUMOUR UPON FAVOURABLE RECOMMENDATION FROM A NEUROLOGIST.

RESPIRATORY DISEASES

7.1 Chronic Obstructive Lung Disease

Some respiratory diseases, if severe enough, may interfere with the safe operation of a motor vehicle. Any marked decrease in the ability of the lungs to provide sufficient oxygen to the brain can lead to impaired judgement, reduced concentration, slowed response time and physical weaknesses. (CMA 15)

Levels of Respiratory Impairment

Level	Description
1	No Impairment
2	Mild Impairment - dyspnea when walking quickly on level ground or when walking uphill; can keep pace with people of same age and body build on level ground but not on hills or stairs.
3	Moderate impairment - unable to keep pace with people of same age and body build when walking on level ground; dyspnea when walking up one flight of stairs.
4	Severe impairment - dyspnea after walking more than 100 m at own pace on level ground; dyspnea sometimes at rest.

Patients with chronic obstructive pulmonary disease (e.g. chronic bronchitis or emphysema) should be evaluated on an individual basis depending on the degree of impairment and the class of motor vehicle they wish to drive. Patients with level 1 or 2 respiratory impairment can usually be allowed to drive any class of motor vehicle. Level 3 impairment may preclude a patient from holding a Class 1 to 4 licence. Patients with severe impairment may be allowed to drive a Class 5 vehicle subject to individual assessment. (CMA 15.2)

STANDARD: MILD IMPAIRMENT - CAN BE ALLOWED TO DRIVE ANY CLASS OF MOTOR VEHICLE SUBJECT TO INDIVIDUAL ASSESSMENT.

MODERATE IMPAIRMENT - MAY BE ALLOWED TO HOLD A CLASS 1 TO 4 LICENCE SUBJECT TO INDIVIDUAL ASSESSMENT.

SEVERE IMPAIRMENT - MAY BE ALLOWED TO HOLD A CLASS 5 LICENCE ONLY SUBJECT TO INDIVIDUAL ASSESSMENT.

7.2 Chronic Pulmonary Disease Necessitating Supplementary Oxygen

Individuals who require portable oxygen to move about should not hold a Class 1, 2, 3, 4 or 6 driver licence but may be considered for a Class 5 only with the approval of the attending respirologist and upon completion of a road test while using the apparatus.

It is recommended the vehicle be fitted with some type of securing device to stabilize the position of the equipment.

STANDARD: SHOULD NOT HOLD A CLASS 1, 2, 3, 4 OR 6 LICENCE; MAY BE CONSIDERED FOR CLASS 5 ON THE RECOMMENDATION OF A PHYSICIAN.

MUST PASS A ROAD TEST WHILE USING THE DEVICE.

7.3 Tracheostomy

The individual with a tracheostomy following a laryngectomy should not operate Class 2 or 4 vehicles unless he can demonstrate the ability to communicate effectively through substitution speech.

STANDARD: INDIVIDUAL SHOULD NOT OPERATE CLASS 2 OR 4 MOTOR VEHICLES UNTIL THE ABILITY TO COMMUNICATE HAS BEEN RE-ESTABLISHED.

METABOLIC DISEASES

Metabolic Diseases and Driving

Disturbances in the functioning of the endocrine glands may be the source of many symptoms with a wide range of severity. Patients with suspected or confirmed endocrine disorders should always be carefully evaluated to make certain that their symptoms do not make them unsafe drivers. The endocrine and metabolic conditions discussed below are among the most common ones that medical personnel may be called on to assess because of their potential for interfering with driving safety. Fitness to drive must be assessed on a case-by-case basis, as the range of signs and symptoms are highly variable.

8.1 Diabetes Mellitus and Hypoglycemia

Diabetes

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

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

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 agents (also referred to as oral hypoglycemics) 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.

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.

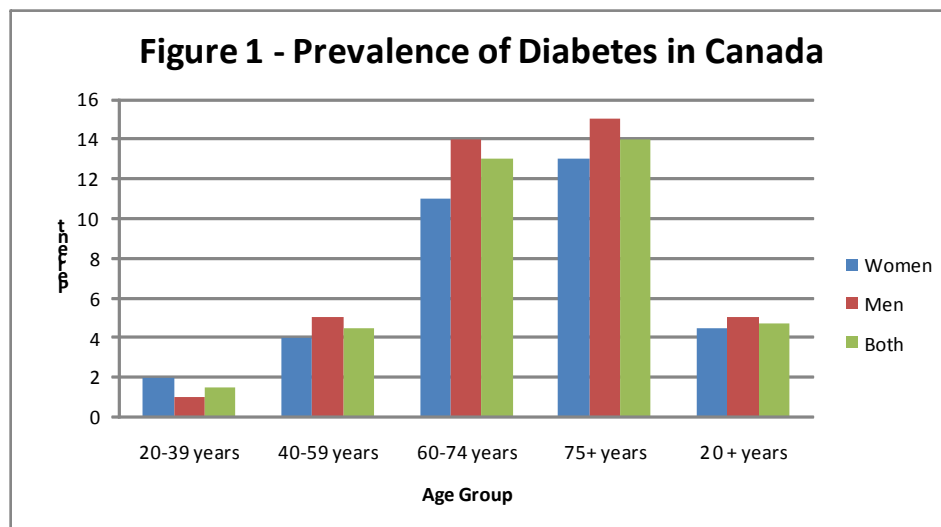
Severe hypoglycemia

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.

8.2 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.



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 glycaemic control, which has been shown to significantly reduce the complications of diabetes. Unfortunately, the use of more intensive treatment to maintain glycaemic 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.

8.3 **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 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. Some studies have indicated 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). Some studies have shown that those treated by diet alone or with a single oral antihyperglycemic agent have shown no elevated risk of crash. Other studies have not demonstrated that the modality of treatment has an effect on crash risk.

A possible 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 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.

8.4 **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.

8.5 Compensation

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

8.6 Standards

8.6.1 TYPE 2 DIABETES:

- a) **TREATED WITH DIET AND EXERCISE ALONE OR,**
- b) **ORAL MEDICATION - NON INSULIN SECRETAGOGUES MEDICATION, i.e. METFORMIN OR,**
- c) **ORAL MEDICATION - INSULIN SECRETAGOGUES i.e. GLYBURIDE, DIAMICRON, ETC**

ELIGIBLE FOR ANY LICENCE CLASS IF:

- **HAS GOOD UNDERSTANDING OF THEIR CONDITION**
- **ROUTINELY FOLLOWS THEIR PHYSICIAN'S INSTRUCTIONS ABOUT DIET, MEDICATION, GLUCOSE MONITORING AND HYPOGLYCEMIA PREVENTION**

Jurisdictions may consider the following when determining an individual's fitness to drive:

- 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

8.6.2. TYPE 1 OR TYPE 2 DIABETES TREATED WITH INSULIN

ELIGIBLE FOR CLASS 5 OR 6 LICENCE IF:

- **UNDERSTANDS THEIR DIABETIC CONDITION AND THE CLOSE INTERRELATIONSHIP BETWEEN INSULIN, DIET AND EXERCISE, AND,**
- **ROUTINELY FOLLOW THEIR PHYSICIAN'S INSTRUCTIONS ABOUT DIET, MEDICATION, GLUCOSE MONITORING, AND HYPOGLYCEMIA PREVENTION AND MANAGEMENT**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- 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

ELIGIBLE FOR CLASS 1-4 LICENCE IF:

- **OBTAINS AND RETAINS 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**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- 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

8.6.3. EPISODE OF SEVERE HYPOGLYCEMIA

ELIGIBLE FOR CLASS 5 OR 6 LICENCE IF:

- **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**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- 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

ELIGIBLE FOR CLASS 1-4 LICENCE IF:

- **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**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- 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

8.6.4. EPISODE OF HYPOGLYCEMIC UNAWARENESS WITHIN PAST YEAR

ELIGIBLE FOR CLASS 5 OR 6 LICENCE IF:

- **HAS BEEN 3 MONTHS SINCE THE EPISODE**
- **TREATING PHYSICIAN INDICATES GLYCEMIC AWARENESS REGAINED AND HAS STABLE GLYCEMIC CONTROL**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- 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

ELIGIBLE FOR CLASS 1-4 LICENCE IF:

- **HAS BEEN 3 MONTHS SINCE THE EPISODE**
- **TREATING PHYSICIAN INDICATES GLYCEMIC AWARENESS REGAINED, HAS STABLE GLYCEMIC CONTROL AND AUTHORITY DETERMINES ARE FIT TO DRIVE**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- 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

8.6.5. PERSISTENT HYPOGLYCEMIC UNAWARENESS**ELIGIBLE FOR CLASS 5 or 6 LICENCE IF:**

- **HAS BEEN 3 MONTHS SINCE LAST EPISODE OF HYPOGLYCEMIA**
- **TREATING PHYSICIAN INDICATED STABLE GLYCEMIC CONTROL AND TAKES STEPS TO ENSURE THEY DON'T BECOME HYPOGLYCEMIC WHILE DRIVING**

Jurisdictions may consider the following in determining an individual's fitness to drive:

- retains blood glucose log and reviews with treating physician at intervals physician feels necessary to monitor continued glyceemic 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

INELIGIBLE FOR CLASS 1-4 LICENCE, (COMMERCIAL DRIVERS)

8.7 Thyroid Diseases

Individuals with marked hyperthyroidism cannot operate any type of motor vehicle safely because of the frequent coexistence of cardiac problems and emotional disturbances.

STANDARD: NOT PERMITTED ANY CLASS OF LICENCE UNTIL THE CONDITION HAS BEEN MEDICALLY TREATED AND CONTROLLED.

8.8 Pituitary Diseases

- (a) Posterior Deficiency: Individuals with diabetes insipidus may operate Class 5 or 6 motor vehicles, provided the underlying pathology is recognized and treated and visual disturbances or other disabling central nervous symptoms are not present.

STANDARD: DIABETES INSIPIDUS - INDIVIDUAL IS ELIGIBLE TO OBTAIN A CLASS 5 OR 6 LICENCE BASED ON CONDITIONS LISTED ABOVE.

- (b) Anterior Deficiency: Individuals with anterior pituitary tumours or other lesions require careful assessment of visual and endocrine function by appropriate medical specialists to indicate their ability to operate any type of motor vehicle safely.

STANDARD: INDIVIDUAL ASSESSMENT IS REQUIRED FOR ANY CLASS OF LICENCE.

- (c) Acromegaly: Individuals require careful neurological, visual and endocrine assessment to ascertain whether they may drive safely.

STANDARD: INDIVIDUAL ASSESSMENT IS REQUIRED FOR ANY CLASS OF LICENCE.

8.9 Adrenal Diseases

- (a) An individual with adrenal cortical hyperfunction (Cushing's syndrome) should not operate a motor vehicle until there is improvement with treatment.
- (b) An individual with adrenal cortical hypofunction (Addison's disease) should not drive any type of motor vehicle until the hypofunction has been fully controlled and is deemed safe to operate a motor vehicle.

STANDARD: INDIVIDUALS WITH CUSHING'S SYNDROME OR ADDISON'S DISEASE MAY NOT OBTAIN ANY CLASS OF LICENCE UNTIL THE CONDITION IS SUCCESSFULLY CONTROLLED OR TREATED.

- (c) Hyperfunction of Adrenal Medulla: Hyperfunction of the adrenal medulla due to pheochromocytoma that results in headaches, dizziness and blurred vision is a contraindication to the operation of any motor vehicle until these symptoms are completely relieved by treatment. (CMA 7.8)

STANDARD: MAY NOT OPERATE ANY MOTOR VEHICLE UNTIL SYMPTOMS ARE TREATED.

RENAL DISEASE

9.1 Role of Chronic Renal Failure in Driving

Persons with serious renal failure were, until quite recently, usually so incapacitated that questions about their ability to drive safely seldom arose. Since the advent of hospital-based and home dialysis programs, and increasing renal transplantation programs, such persons are often able to lead relatively normal lives and are quite capable of driving many kinds of motor vehicles safely.

9.2 Driving Hazards Associated with Intermittent Hemo Dialysis

The driving hazards associated with intermittent dialysis arise mainly from the possibility that a person with chronic renal disease may not always obtain satisfactory dialysis at the required intervals. This may be due to a medical problem or because the person cannot be at the dialysis unit at the time the procedure is required. Such an absence may occur when a professional driver is required to travel long distances from home or when a private driver leaves home on business or for pleasure. It is felt an individual with chronic renal failure who requires intermittent or continuous peritoneal dialysis, but is otherwise in good health, can drive a Class 5 or 6 vehicle safely.

STANDARD: MAY OPERATE A CLASS 5 OR 6 VEHICLE.

APPLICANTS FOR A CLASS 1, 2, 3 OR 4 LICENCE MUST BE EVALUATED BY AN INTERNIST AND SUBJECT TO REGULAR MEDICAL REVIEW.

9.3 Renal Transplant

It is believed that a person who has had a successful renal transplant may be issued a Class 5 or 6 driver licence. Such persons should refrain from driving for 3 months postoperatively. Persons applying for or holding a Class 1, 2, 3 or 4 licence should undergo medical evaluation by the appropriate specialist after renal transplant.

It is suggested the holder of a Class 1, 2, 3 or 4 driver licence in this situation should be subject to regular medical review.

STANDARD: ELIGIBLE FOR A CLASS 5 OR 6 LICENCE.

APPLICANTS FOR A CLASS 1, 2, 3 OR 4 LICENCE MUST BE EVALUATED BY A SPECIALIST AND SUBJECT TO REGULAR MEDICAL REVIEW.

MUSCULOSKELETAL DISABILITIES

10.1 Musculoskeletal Disabilities and Driving

Persons operating motor vehicles of any class must be able to carry out many complex muscular movements in order to control a vehicle properly. The ability to perform these movements swiftly, accurately and repeatedly must be carefully evaluated if there is any question of disability. In most cases the best method of assessment is through a road test conducted by the driver examiner.

10.2 Disabilities of the Limbs

- (a) Upper limb: A person with an amputation, paralysis or deformity of either arm who is able to demonstrate his ability can usually drive a private motor vehicle safely, provided it is equipped with an automatic transmission, power-assisted steering and special mechanical devices to permit all hand controls to be operated by the normal hand.

An individual with an amputation of either hand or arm below the elbow who is fitted with an adequate prosthesis and is able to drive properly without the use of special mechanical devices may be allowed to apply for any class of driver licence provided he is able to satisfactorily complete a road test in the vehicle.

STANDARD: MAY OPERATE A PRIVATE MOTOR VEHICLE; INDIVIDUALS FITTED WITH PROTHESIS CAN OPERATE ANY CLASS OF VEHICLE GIVEN DEMONSTRATION OF ABILITY IN A ROAD TEST.

- (b) Lower limb: An individual with a below-knee amputation of one leg only who has full movements in back, hip and knee joints in the other leg and wears a properly-fitted prosthesis may be allowed to apply for any class of licence provided he is able to satisfactorily complete a road test in the vehicle with or without the use of special mechanical devices. The individual with paralysis of or an above-knee amputation of one or both legs who has full use of both arms and hands and no loss of strength or movement in the back may be able to drive a Class 5 vehicle equipped with special mechanical devices to permit the foot controls to be hand-operated.

STANDARD: IF INDIVIDUAL IS FITTED WITH PROSTHESIS AND CAN DEMONSTRATE ABILITY IN A ROAD TEST, ELIGIBLE FOR ANY CLASS OF LICENCE.

INDIVIDUAL WITH PARALYSIS MAY OPERATE A CLASS 5 VEHICLE EQUIPPED WITH SPECIAL MECHANICAL DEVICES.

- (c) Hand and Foot: Every individual wishing to hold a driver licence and who has an apparent impairment of hand or arm function must be required to demonstrate the ability to grip the steering wheel adequately to turn it through its full range of movement or adequately control an alternative steering mechanism and to reach and operate all hand controls on the vehicle.

Similarly every individual with an apparent impairment of foot or leg function must be required to show the ability to reach and operate all foot controls. The driver examiner must determine whether any special mechanical devices are required and restrict the individuals to vehicles appropriately equipped.

STANDARD: ELIGIBLE FOR ANY CLASS OF LICENCE GIVEN DEMONSTRATION OF ABILITY IN A ROAD TEST.

10.3 Disabilities of the Spine

- (a) Cervical Vertebrae: The person with some loss of movement of the head and neck may be able to safely operate any motor vehicle equipped with adequate outside mirrors. Individuals wearing rigid neck braces or casts should not operate a motor vehicle until recovery has reached the point where pain and restriction of movement are minimal and external support is no longer necessary.

STANDARD: MAY OPERATE ANY MOTOR VEHICLE PROVIDED THE VEHICLE IS EQUIPPED WITH ADEQUATE MIRRORS AND SUBJECT TO A SATISFACTORY ROAD TEST.

- (b) Lumbar Vertebrae: The holder of a Class 1, 2, 3 or 4 driver licence should be free of lumbar pain or deformity and have, at the most, only a minimal loss of movement.

STANDARD: MAY BE PERMITTED TO DRIVE ANY VEHICLE PROVIDED A SATISFACTORY ROAD TEST.

PSYCHIATRIC DISORDERS

11.1 Mental Disorders and Driving

Mental disorders present a challenge to the physician assessing a patient's fitness to drive. The variety of conditions, the often rapid fluctuation in severity and the lack of scientific information about the effect of such disorders on driving make it extremely difficult to establish firm guidelines.

In examining a patient with a mental disorder the diagnosis itself is less important than the degree to which it affects the ability to drive safely. Physicians should look for signs of undue preoccupation, reduced concentration, uncontrolled aggressiveness, recklessness, impaired judgement and psychomotor retardation. Also, they should keep in mind that mental impairment may be a sign of a non-psychiatric medical condition. (CMA 13)

11.2 Emotional Disorders

Many otherwise healthy people become emotionally disturbed if they experience periods of severe stress. They may become absorbed in their problems to a degree that makes concentration on the world around them difficult.

Depression may be associated with slowed reaction time, preoccupation with gloomy feelings and a sense of hopelessness or despair. It is not uncommon for a severely depressed person who has thoughts of suicide to imagine driving his or her car into another vehicle or off a bridge, for example.

Pathological elevation of mood (mania or hypomania) is often accompanied by feelings of invulnerability and recklessness, which could lead to the taking of needless risks. Patients who are manic or hypomanic may also have a low threshold for irritation, which may make them dangerous drivers.

Certain manifestations of anxiety disorders may impair driving ability. These could include startle reactions, tremulousness and panic attacks in traffic that is congested or is stopped at a stop signal. (CMA 13.2)

If the physician believes that a patient's judgement or psychomotor activity has been severely affected by his or her emotional state, the patient should be advised not to drive any type of motor vehicle until sufficiently recovered.

The possible side effects of many prescribed drugs should be considered when making this assessment. (CMA 13.2)

11.3 Personality Disorders

People with personality disorders often show a wanton disregard for accepted social values and have a history of erratic, aggressive or irresponsible behaviour, which may include repeated traffic violations. Patients exhibiting these characteristics should not be allowed to drive without very careful consideration and a psychiatric assessment. (CMA 13.3)

Patients exhibiting the foregoing characteristics of personality disorders should not be allowed to drive until a favourable psychiatric assessment has been conducted.

11.4 Psychotic Illnesses

The individual who has suffered an acute psychotic episode should be permitted to drive only after a period of satisfactory mental and emotional stability has been demonstrated and the individual's request to resume driving is supported by the attending psychiatrist. In the case of recurrent episodes, the individual could be allowed to operate a Class 1, 2, 3 or 4 vehicle only after at least a six-month period free of psychotic episode with a detailed report of a psychiatric assessment. In both instances the psychiatrist's assessment should include details of the person's illness, the treatment prescribed including medication(s) and dosage(s), and the individual's current status. The attending psychiatrist should be requested to express an opinion as to the individual's suitability for the class of driver licence applied for.

Any individual with a history of a recent episode holding any class of licence must be reviewed on a frequent basis due to the risk of a recurrence and need to monitor compliance to prescribed treatment. A physician who is unable to persuade an acutely psychotic patient to stop driving should notify the licensing authorities at once.

STANDARD: SINGLE ACUTE PSYCHOTIC EPISODE - MAY QUALIFY FOR ANY CLASS OF LICENCE AFTER A PERIOD OF SATISFACTORY EMOTIONAL AND MENTAL STABILITY AS DOCUMENTED IN A DETAILED PSYCHIATRIST'S REPORT.

RECURRENT EPISODES - ELIGIBLE FOR A CLASS 1, 2, 3 OR 4 LICENCE AFTER SIX MONTHS FREE FROM FURTHER PSYCHIATRIC PROBLEMS AND IF PSYCHIATRIST'S REPORT IS SUPPORTIVE.

11.5 Psychiatric Therapy

Patients who are receiving electroconvulsive therapy should not be allowed to drive any type of motor vehicle until the attending psychiatrist's assessment is favourable.

Patients receiving long-term drug therapy should be monitored regularly for effectiveness of medication and possible side effects.

STANDARD: ELECTROCONVULSIVE THERAPY - SHOULD NOT BE ALLOWED TO DRIVE ANY TYPE OF VEHICLE UNTIL FAVOURABLE PSYCHIATRIC ASSESSMENT.

LONG-TERM DRUG THERAPY - SHOULD BE CLOSELY MONITORED TO ENSURE EFFECTIVENESS OF MEDICATION AND TO DETECT POSSIBLE SIDE EFFECTS.

11.6 Behaviour and Learning Disabilities

In evaluating a person suspected of or proven to have a behavioural or learning problem (including attention deficit disorder [ADD], attention deficit hyperactivity disorder [ADHD], Fetal Alcohol Spectrum Disorder [FASD] and Tourette's syndrome), physicians should endeavour to determine whether the patient is able to understand and respond appropriately to traffic signs and signal situations. Licensure for patients diagnosed with ADD, ADHD and FASD should be based on clinical assessment, where indicated, and positive response to treatment.

For those with learning disabilities, other potential sources of difficulty might include visual and auditory overload and difficulty in being able to distinguish between left and right.

Evaluation of driving ability in patients with behavioural and learning disabilities is probably best carried out in a road test conducted by a professional driving instructor, possibly after a series of driving lessons. People with these disabilities may be able to manage in uncongested, slow rural traffic, but unable to drive safely in heavy traffic or on high speed expressways. Under these circumstances, a conditional licence may be recommended. Physicians should also determine whether the patient has difficulties with emotional control or attention span that may interfere with safe driving. Those who appear to have borderline abilities in these areas may also be referred for psychologic testing to investigate further their ability to drive safely.

As with other medical conditions, higher standards are expected of those wishing to drive commercial or passenger transport vehicles (Class 1, 2, 3, 4) because of the range and complexity of driving tasks involved.

THE EFFECTS OF DRUGS

12.1 Drugs and Driving

There are many drugs known to potentially impair the ability to operate a motor vehicle safely. The degree of impairment caused by a particular drug in a particular dosage will vary greatly from person to person, therefore the opinion on the effects of the drugs on the individual as expressed by the individual's attending physician is of paramount importance in determining whether a disabling reaction will occur. For each drug there is a safe or tolerable dose but more importantly, there is an impairing or toxic dose. When an impaired level is reached for many drugs as pointed out below, this is both illegal for driving and constitutes a health hazard. Many drugs are used only to achieve a level of impairment and no vehicle should be driven while the driver is in such a state.

Habitual use of any drug, including alcohol to a level of impairment, must be of concern in estimating whether a continuing risk exists and thus warranting the loss of licence for an extensive period of time. This misuse may reflect poor control of an existing medical condition, or a true addiction, or some habitual misuse based on personality or psychological factors.

When assessing the effects of prescribed drugs on an individual, the possibility of drug interactions and the synergy of secondary effects of multiple medications must be considered

12.2 Sedatives

(Note: many of these, especially benzodiazepines, are commonly called minor tranquilizers.) Individuals on mild sedation who experience no drowsiness can usually drive any vehicle safely depending on the presence of underlying significant medical problems. Those individuals on heavy sedation for therapeutic reasons or who are known to be addicted to such drugs as benzodiazepines, or a variety of less commonly prescribed sedatives, should not drive any motor vehicle. Many sedatives and analgesics can be bought over the counter in modest dose form but be used in sufficient quantity to achieve impairment, dependence or addiction.

STANDARD: INDIVIDUALS ADDICTED TO SEDATIVE-HYPNOTIC DRUGS SHOULD NOT OPERATE ANY MOTOR VEHICLE UNTIL RECOVERY IS DEMONSTRATED.

12.3 Major Tranquilizers and Antidepressants

Individuals stabilized on a maintenance dosage but free of drowsiness, hypotension or other symptoms can usually drive any class of motor vehicle.

STANDARD: IF INDIVIDUAL REMAINS SYMPTOM-FREE, MAY BE ELIGIBLE FOR ANY CLASS OF MOTOR VEHICLE, DEPENDING ON THE EXTENT OF CONTROL OF THE UNDERLYING DISEASE.

12.4 Narcotics

The euphoria or depression and loss of ability to concentrate that often follow the use of heroin, morphine and some of the synthetic narcotics, such as meperidine (Demerol), are potentially dangerous and this may warrant disqualification from operating any class of motor vehicle after assessment of frequency and habituation.

However, persons on a formal maintenance program of prescribed methadone are considered eligible for all classes of licences on the recommendation of the attending physician.

The current popular narcotic cocaine and its variant "crack" has limited so-called recreational use. It is euphorizing, excitatory and very dangerous. Equal care and judgment must be exerted regarding its uses as with other drugs.

Physicians should also carefully observe patients who are on prescribed continuing analgesic medication and warn them not to drive if they appear to be drowsy or otherwise affected. Where a physician feels a patient is unduly dependent but not obviously addicted, he or she should be on guard for "double doctoring" or over-the-counter supplementation.

STANDARD: INDIVIDUALS REPEATEDLY USING NON-PRESCRIPTION NARCOTICS MAY NOT BE ELIGIBLE TO OPERATE ANY CLASS OF VEHICLE, DEPENDING ON DEGREE OF DELIBERATE ABUSE OR LOSS OF CONTROL.

PERSONS ON A FORMAL MAINTENANCE PROGRAM OF PRESCRIBED METHADONE ARE ELIGIBLE FOR ALL CLASSES OF LICENCES ON THE RECOMMENDATION OF THE ATTENDING PHYSICIAN

12.5 Hallucinogens

Drugs that alter perception, such as LSD, STP and MDA, impair driving ability because of their marked pharmacologic actions. Persons while under the influence of such drugs should not drive any type of motor vehicle.

Even marijuana, considered milder than others, because it may alter normal emotional reactions and cause individuals to become indifferent to their surroundings, can be expected to impair driving ability.

STANDARD: PERSONS USING HALLUCINOGENS OR MARIJUANA REPEATEDLY MAY BE RESTRICTED FROM OPERATING ANY CLASS OF MOTOR VEHICLE DEPENDING ON ESTABLISHMENT OF HABITUAL USE AND/OR DEPENDENCE.

12.6 CNS Stimulants (Amphetamines)

Although central nervous system stimulants such as amphetamines may initially increase alertness and efficiency, their effect is notoriously unpredictable and marked changes in mood and behaviour can occur. If this type of drug is being used, the person must always be warned not only about the possible initial hazards, which are a contraindication to driving, but also about the dangerous period of depression and fatigue that can follow.

STANDARD: HABITUAL USERS OF AMPHETAMINES MAY BE RESTRICTED IN OPERATING ANY CLASS OF MOTOR VEHICLE BECAUSE OF THE SIDE EFFECTS THAT MAKE DRIVING HAZARDOUS. DRIVING UNDER THE INFLUENCE MAY LEAD TO CANCELLATION OF ANY LICENCE.

THE EFFECTS OF ALCOHOL

13.1 Alcohol and Driving

It should be recognized that, despite its social acceptance, alcohol is simply another sedating drug that interferes with judgment, reflex control and behaviour. A blood alcohol level of 11 mmol/l (50 mg/dl) may cause sufficient loss of driving skill to create a menace on the highway.

STANDARD: IMPAIRED INDIVIDUALS ARE NOT PERMITTED TO DRIVE ANY CLASS OF MOTOR VEHICLE.

13.2 Alcohol dependence and alcohol withdrawal seizures

Habitual alcoholic intoxication is recognized as a serious medical disability. An applicant requesting completion of a driver's medical examination form, whom the physician knows is frequently intoxicated to the extent that ability to drive a motor vehicle may be impaired, should have this disability recorded on the examination form. Habitual misuse is the concern regardless of whether the drinking is addictive, or the result of some other psychiatric or personality disorder, or both.

Patients demonstrating drinking and driving behaviour, where there is evidence of high probability of driving while impaired must not drive for 12 months. Where there is an opportunity to have a patient enrolled in a rehabilitation program and to monitor their alcohol use behaviour by an addiction medicine specialist, the restriction on driving may be reduced (Persons charged by policing agencies for impaired driving will have their driving privileges restricted according to provincial legislation. These guidelines are not meant to conflict with such legislation).

Where there is an opportunity to have a patient enrolled in a rehabilitation program and to monitor their alcohol use behaviour by an addiction medicine specialist, the restriction on driving may be reduced

Patients with a diagnosis of alcohol dependence, including those with alcohol withdrawal induced seizures, should not be allowed to drive any type of motor vehicle. Persons habitually dependent on alcohol should not drive until evidence of alcoholism is no longer a problem. These patients must complete a recognized rehabilitation program for substance dependence and remain alcohol free and seizure free for a specified period of time before recommencing driving.

STANDARD: MAY NOT DRIVE ANY MOTOR VEHICLE FOR 12 MONTHS DURING WHICH TIME THE INDIVIDUAL MUST REMAIN SEIZURE-FREE AND ALCOHOL-FREE

EARLIER RELICENSURE MAY BE CONSIDERED UPON FAVOURABLE RECOMMENDATION FROM AN ADDICTION SPECIALIST RECOGNISED BY THE LICENSING AUTHORITY AND THE SUCCESSFUL COMPLETION OF AN ALCOHOL REHABILITATION PROGRAM

THE AGEING DRIVER

14.1 The Effects of the Ageing Process on Driving Ability

Although the rate of physical and mental decline varies greatly from person to person, the physiologic changes that accompany the ageing process will eventually affect everyone's driving ability. The point at which deterioration makes the individual a hazard can be difficult to determine and for this reason it is recommended a standard frequency of medical review be established. It is recommended that Class 1, 2, 3 and 4 licence holders be 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. The Class 5 and 6 licence holder should be required to file a satisfactory medical report at age 75, at age 80 and every 2 years thereafter. More frequent reviews should be required where the condition of the individual warrants such action.

STANDARD: RECOMMENDED FREQUENCY OF MEDICAL REVIEW

- | | |
|-------------------------|--|
| CLASS 1, 2, 3, 4 | - ON APPLICATION |
| | - AT LEAST EVERY 5 YEARS TO AGE 45, AND |
| | THEREAFTER EVERY 3 YEARS TO AGE 65 |
| | - ANNUALLY AT 65 AND OVER |
| CLASS 5 AND 6 | - MEDICAL REVIEW AT AGE 75 AND 80 |
| | - EVERY 2 YEARS OVER AGE 80 |

14.2 Factors to be Considered in Licensing Ageing Drivers

In assessing the older driver factors such as slowed reaction time, lack of attentiveness, poorer judgement, failing vision, slowed thought process, episodes of confusion, declining memory, loss of physical strength, arthritis, severe respiratory problems and liability to sudden changes in heart rhythm must be considered. The possible side effects of required drugs such as tranquilizers and sedatives must be of concern.

STANDARD: AGEING FACTORS MUST BE TAKEN INTO ACCOUNT WHEN CONSIDERING LICENSING PRIVILEGES.

14.3 Restricted Driving Privileges

With the support of a physician familiar with the individual's medical history it is believed each jurisdiction may consider issuing a driver licence bearing restrictions against vehicle operation in difficult or fatiguing situations. Such restrictions could include prohibitions against night driving, long distance driving, high-speed controlled-access highway driving, and driving only in a specific area during specific time periods, i.e. outside rush hours.

STANDARD: WHEN APPLIED PROVINCIALLY, RESTRICTIONS AGAINST MOTOR VEHICLE OPERATION ARE TO BE BASED ON SUPPORT FROM A PHYSICIAN FAMILIAR WITH THE INDIVIDUAL'S MEDICAL HISTORY.

RESTRAINT SYSTEM EXEMPTIONS

15.1 Medical Conditions Warranting Exemptions

15.1.1 Seat Belts and Motorcyclist Helmets

The medical profession in Canada has declared itself unequivocally in favour of the use of restraint systems in all motor vehicles at all times by drivers and passengers. (CMA 20.1)

There are no medical or physical conditions that call for exemption from using seat belts (CMA 21.4) or helmets for motorcyclists.

CCMTA Medical Standards for Drivers

Appendix 1:

Vision Standards and Fitness to Drive

January 2004

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Visual Functions and Driving

The table lists visual functions along with the aspects of driving potentially affected and the conditions that typically cause this loss in visual functioning.

Visual Function (Casson 2000)	Potential Driving Impairment If Vision Function Diminished	Related Vision Condition (Dr's. Henry and Teichman, Jean-Pierre Gagnon, InteliHealth and others)
<p>Static Visual Acuity</p> <p>“The ability to discriminate between forms” (Anderson 22)</p>	<p>Difficulty seeing or distinguishing traffic signs, signals and other visual information. Prolonged or no reaction time to a signal or obstacle on the road (Gagnon)</p>	<p>Cataracts, glaucoma, macular degeneration. hemianopsia (Henry and Teichman). Hypermetropia, myopia, prebyopia, anisometropia, astigmatism, strabismus, pathologies of the retina, optic nerve, visual pathways, and cornea (Gagnon). Retinitis pigmentosa (“InteliHealth”)</p>
<p>Contrast Sensitivity/Glare Disability</p>	<p>Difficulty seeing when exposed to glare, strong sunlight and bad weather (Buyck et al 1988).</p>	<p>Cataracts, monocular vision,</p>
<p>Peripheral Vision (visual field)</p> <p>“Situating away from the centre or central structure” (Anderson 1263)</p>	<p>Difficulty seeing objects located to the right, left, upward and downwards when looking straight ahead. : prolonged reaction time (Gagnon).</p>	<p>Cataracts, monocular vision, glaucoma, hemianopia, quadrantanopia. Central or horizontal scotoma (Henry and Teichman), hypermetropia, myopia, prebyopia, anisometropia, astigmatism, strabismus, pathologies of the retina, optic nerve, visual pathways, and cornea (Gagnon).</p>
<p>Depth Perception (including stereopsis)</p>	<p>Difficulties seeing highway signs (McKnight 1991). Difficulties maintaining safe following distance, merging and yielding in traffic conflict situations, changing lanes and passing, complying with traffic control devices, backing up and parking (Decina 1991)</p>	<p>Monocular vision, glaucoma. diplopia (Henry and Teichman) Strabismus (“InteliHealth”).</p>
<p>Colour Vision</p>	<p>Ability to distinguish the onset of brake lights from adequate distance, as well as signs and lights of various colours.</p>	<p>Cataracts, red/green colour blindness, dyschromatopsia (inability to distinguish three primary colours), this condition is related to glaucoma and diabetes (Gagnon). Retinitis pigmentosa (“InteliHealth”).</p>
<p>Night Vision</p>	<p>Inability to see adequately for night driving.</p>	<p>Night myopia, retinitis pigmentosa</p>

Vision and Driving Risk

There is extensive research on the subject of vision and driving examining the relationship between visual conditions, collision rates, and driving performance. The studies are summarized in the table below:

Condition	Author(s)	Increased Collision Rate/Impairs Driving Ability	No Increase in Collision Rate/Associated with Safe Driving	Quote
Colour Vision	Steward and Cole, 1989; Verriest et al, 1980	0		“Severe colour vision deficits are thought by some experts to be a potential hazard in the discrimination of red from green signal lights”
	Owsley and McGwin 1999		0	“Colour vision deficiency does not represent a risk to driving”
Visual Acuity Defects	Owsley and McGwin		0	“Visual acuity is weakly related to crash involvement”
	Charman, 1997; Owsley and McGwin 1999		0	“Visual acuity in itself is not highly related to driving performance, and other measures should be used to determine visual functionality of drivers”
	Janke, 1986		0	“Visual defects play an extremely small role as an identified cause of an accident”
	Buyck 1988	0		“Reduced visual acuity was reported by the drivers as reducing their ability to read traffic signs in time to act in the Indiana tri-level study”
Retinitis Pigmentosa	Szlyk et al, 1992	0		“Individuals with severely reduced visual fields due to RP (20° or less) have difficulty performing on a driving simulator and report more accidents”
	Fishman, Anderson, Stinson, and Haque 1981	0		“Driver’s with RP were involved in more crashes during the prior 5 years than disease-free controls, an association due in part to a disproportionate number of female RP patients who were in a crash”
	Szlyk, Severing, and Fishman 1991	0		“In a study that assessed driving performance of RP patients on an interactive driving simulator test, subjects with RP reported statistically significantly more accident involvement than control subjects did”
	Fishman et al., 1981; Szlyk et al., 1992, 1993b	0	0	“Some individuals with RP do poorly and some perform as well on the simulator as age-matched normal drivers and report similar accident frequencies”
Contrast Sensitivity (Can be detected in patients with cataracts)	Higgins 1998 Decina 1993	0		“Loss in contrast sensitivity is more highly correlated with poor performance on closed road assessments and crash frequency than visual acuity.”
	Owsley, Stalveu, Wells and Sloane 1990	0		“When comparing two groups of persons with cataracts and without cataracts, those with cataracts were 2.5 more times as likely to have had a crash during the prior five years”
Glaucoma	Johnson and Keltner 1983	0		“ Glaucoma is associated with visual field loss and it has been demonstrated that drivers with binocular field loss had traffic accidents and conviction rates twice as high as those with normal visual fields”
	McCloskey, Koepsell, Wolf and Buchner 1994	0		“Older drivers involved in an injury collision were 50% more likely to have glaucoma than were those not involved in any crash”
	Foley, Wallace, and Eberhand 1995	0		“Foley Wallace and Eberhand (1995) found an increased crash rate (unadjusted for mileage) for older drivers with Glaucoma”
	Owsley, McGwin and Ball 1998	0		“Older drivers involved in injury crashes during

				the prior 5 years were 3.6 times more likely than those who were crash-free to have glaucoma”
Diabetic Retinopathy	Hansotia and Broste (1991)		0	“No studies have shown an association between diabetic retinopathy and increased crash risk, though the 57% higher rate of injury accidents found for diabetic drivers by Hansotia and Broste (1991) may in part have been due to retinal changes associated with the disease.”
Age-related macular degeneration	McCloskey, Koepsell, Wolf, and Buchner (1994)		0	“No association between AMD and crash involvement”
Scotoma	Szlyk at al. 1993a	0		“ The presence of a scotomata due to macular dystrophies (predominantly within 20°) does increase the likelihood of accidents at night, but the relationship is not as strong as for the type of peripheral restriction seen in RP”
Monocular Vision	Casson 2000		0	“She concluded that there is no evidence that monocular drivers have an increased risk of collision”
	McKnight 1991	0		“Monocular persons are capable of driving tractor-trailers as well as binocular truck drivers, but there was some problem in viewing highway signs by the monocular group”
	Keeney, Garvey, Brunker’s 1981	0		“A study of the five-year driving experience of 52 Kentucky monocular drivers indicated that those drivers had a significantly greater rate of crashes (i.e. crashes per 1,000 drivers) than the general motoring public and more reckless driving violations”
Visual Field Defects	Wood and Troutbeck 1992 and Johnson and Keltner (1983)		0	“There is no evidence of impaired driving due to a loss of vision in a particular location in the visual field”
	Johnson at al, 1983; Keltner at al, 1980, 1987	0		“Individuals with binocular visual field loss have more than twice as many accidents as normal individuals of the same age”
	Casson at al, 1998b; Johnson et al, 1992, 1993b	0		“ In such tasks as surveillance, performance remains relatively intact until the visual field is reduced below 120°”
	Kite and King 1961, cited in Keeney and Garvey, 1981	0		“A large reduction (undefined) in the visual field on one side is associated with a 7-fold increase in intersectional crashes and pedestrian injuries”
	Higgins, Wood and Tait 1996	0		“Driving performance becomes significantly compromised once the lateral field dimension falls below 90 degrees.”
	McKnight at al 1991	0		“Of 40 monocular and 40 binocular volunteer heavy-duty truck drivers matched on age. In the off highway environment monocular drivers performed approximately 12% worse than their binocular counterparts in their ability to read signs during daylight. In the highway traffic environment, no significant differences were observed”
	Liesma 1973	0		“Visually limited drivers have more hazardous driving patterns than others; among 25 drivers entering major roads dangerously, 12% to 48%, depending on the criteria applied, were visually limited and 2 were blind in one eye”
Hemianopsia	Racette and Casson, 1999	0		“Hemianopia leads to unsafe driving; left hemianopia impairs driving performance more than right side deficits”
	Strong 1999	0		“Hemianopic subjects should not drive, with or without prism lenses”
	Cohen and Waiss 1996	0		“Hemianopic patients should be strongly discouraged from driving despite the fact that in many states (which lack minimum field requirements) they remain qualified to drive”

Interpreting the Research

Results for the type of study are dependent on the methodology with which the study was conducted. The main methodological shortcoming in studies is that measuring the risk is difficult because drivers who are severely visually impaired are already excluded from driving, causing sampling bias.

Evaluating visually impaired drivers in a controlled driving situation is a method used to quantify driving performance in terms of errors, reaction time and driving speed. These situations cannot be completely real, meaning they may not reflect performance in real roadway scenarios.

The case study approach focuses on individual cases reported in depth. Examining specific cases allows researchers to understand individual variability that occurs in driving. One of the problems associated with this method is that it requires further, more generalized studies to demonstrate how the conclusions apply to driving in general.

Driving simulators allow researchers to view the impact of a driver's visual impairment in a closed situation. This type of study is useful for assessing the risk of drivers, where it may not be safe to drive under normal circumstances. The downfall is that often these studies do not accurately predict the on road safety risk. The type of simulator used and the visual impairment under study strongly influences the validity of the results (Casson 13).

Expert Opinion

The main sources of expert opinion involved in the process of generating vision standards for this document came from those involved in deriving the National Safety Code's (NSC) *Medical Standards for Drivers*, the Canadian Medical Association's (CMA) *Determining Medical Fitness to Drive 6th ed*, as well as the Canadian Ophthalmological Society.

Medical advisors and administrators from Canadian provincial driver licensing bodies developed the medical standards, or guidelines, proposed in the NSC ("Medical Standards for Drivers" 1). The NSC has been reviewed and updated on a bi-annual basis based on recommendations provided through a meeting of the Medical Advisory Committee.

The CMA guidelines were developed through a broad based consultation exercise that was undertaken under the leadership of a Project Advisory Group, comprised of four member physicians with a range of relevant practice and advisory experience pertaining to driver safety. The advisory group was aided in its deliberation by a review of recent scientific reports for each section of the guide. "The draft was widely circulated to medical and nonmedical organizations, provincial driving authorities and selected experts" ("Determining Medical Fitness to Drive" 1).

The COS Driving Study, was developed by a group of provincially represented experts including: Evanne Casson, PhD, Duncan Anderson, MD, Raymond Buncic, MD, Balwanthy Chauchan, PhD and Claude Duquette, MD. On behalf of the COS, the panel of experts reviewed the vision requirements for driving from three perspectives. 1) Surveying transport authorities in Canada and the United States to determine the current standards and procedures. 2) Reviewing the recent scientific literature pertaining to visual function and driving. 3) "The COS Working Group on Driving Standards used the information from the survey and the literature review to develop a set of recommendations for new vision standards and a new standardized approach to the application of these standards" (Casson 1).

The expert opinion outlined above demonstrates a consensus on the dimensions of a vision standard. Based on this expert opinion, the consensus evidence on visual functions and driving, and the empirical evidence on visual functions and driving risk, the following are recommended as a guideline for driver licensing:

Condition	Recommended Standard
<p>Visual Acuity ⇒ “The ability to discriminate visually between forms” (Anderson 23).</p>	<p>Class 1,2,3,4 (Emergency) and 6- Binocular vision: Not less than 20/30 (6/9) Worse eye: Not less than 20/100 (6/30)</p> <p>Class 4 and 5- (Taxi) & (Commercial) Binocular vision: Not less than 20/40 (6/12) Worse eye: Not less than 20/200 (6/60)</p> <p>Class 5- (Personal Use) Binocular vision: Not less than 20/50 (6/15)</p>
<p>Visual Field ⇒ “The area within which stimuli will produce the sensation of sight with the eye in a straight-ahead position” (Anderson 629).</p>	<p>Class 1,2,3,4 (Emergency) and 6- Binocular vision: 150 continuous degrees along the horizontal meridian. 20 continuous degrees above and below fixation.</p> <p>Class 4 and 5- (Taxi) & (Commercial) Binocular vision: 120 continuous degrees along the horizontal meridian. 15 continuous degrees above and below fixation.</p> <p>Class 5- (Personal Use) Binocular vision: 120 continuous degrees along the horizontal meridian. 15 continuous degrees above and below fixation.</p>
<p>Diplopia ⇒ “Double vision in which the images are formed on non-corresponding points of the retina” (Anderson 475).</p>	<p>Diplopia within the central 40° of primary gaze- May not operate any motor.</p> <p>Uncorrected diplopia within the central 40° of primary gaze- Should be referred to an ophthalmologist or optometrist for further assessment.</p> <p>Corrected diplopia with a patch or prism- May be eligible to drive. -Prior to resuming driving there should be an adjustment period of approximately three months.</p>
<p>Colour Vision ⇒ “Perception of the different colours making up the spectrum of visible light; it is mediated by the cones of the retina” (Anderson 1832).</p>	<p>Class 1,2,3,4 (Emergency) and 6- Discrimination of red, green and yellow.</p> <p>Class 4 (Taxi) and 5 (Commercial)- No required standard.</p> <p>Class 5 (Personal Use)- No required standard.</p>

<p>Contrast Sensitivity ⇒ “The degree to which light and dark areas of an image differ in brightness or in optical density” (Anderson 373).</p>	<p>Individuals should be made aware of any significant reduction in contrast sensitivity.</p>
<p>Depth Perception ⇒ “The proper recognition of depth or the relative distances to different objects in space” (Anderson 1255).</p>	<p>A driver who has recently lost the sight of an eye or stereopsis may require a few months to recover the ability to judge distance accurately.</p>
<p>Dark Adaptation and Glare Recovery</p>	<p>A partial loss of these functions in elderly drivers, particularly those with cataracts or macular disease, may at times justify limiting their driving to daylight hours.</p>

Other Criteria:

<p>Exceptional Cases</p>	<p>In exceptional cases when a person becomes visually impaired, the capacity to drive safely varies with his/her compensatory abilities. As a result there may be people who do not meet the standards and can drive safely, as well as those who meet the standards and drive unsafely. It is in these situation that an individual should undergo a special assessment to determine their fitness to drive based on the following criteria;</p> <ol style="list-style-type: none"> 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 (Professional, employment, etc) 6) Assessment by a specialist at a recognized rehabilitation or occupational therapy centre for driver training.
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Compensation

Compensation is the use of the strategies, devices, and training by someone who has compromised visual functioning to improve their ability to drive without compromised vision.

Experiential Factors

The ability to compensate will vary with the length of time someone has been affected by a vision condition. For example, someone with a congenital condition will be better able to adapt and compensate than someone with a recently acquired visual deficit. Generally the longer a person has suffered from a condition the more able they are to adapt to their loss in sight, depending on the severity of the loss in vision (Henry and Teichman).

Awareness of the Condition and its Effect on Driving

Individuals with a loss in visual functioning must acknowledge awareness of their condition. These individuals must recognize their conditions and its effect on driving ability, as well as recognize the need to develop and use compensatory strategies to be able to drive safely.

Strategies

Strategies to compensate for a loss in visual functioning are available to individuals to help them manage their condition effectively. Some examples of these strategies include: restricting daytime driving, shoulder checks, driving within a limited geographical area, restricted limits on speed, scanning and route planning.

Devices

“Bioptic telescopic lens systems, or BTL’s, consist essentially of a telescope mounted before one eye to enable low-vision drivers to resolve fine detail, as in reading street signs” (“Medical Conditions and other Factors in Driver Risk” 45). The difficulty with the use of bioptics for driving is that they highly magnify images, which in turn obscures most of the surrounding visual field.

A Fresnel lens is a type of prism placed on the rear spectacle to compensate for a person's decreased field of view and bilateral field defects. A second type of prism can also be placed manually on a person's glasses by applying a thin prism that sticks directly to the lens (Henry and Teichman). When looking through these prisms the clarity and quality of the user's vision is diminished. The appropriate response is to use routine saccadic eye movements into the prism to detect objects of interest, and to follow these with a compensatory head rotation so that the object can be inspected through the portion of lens without a prism attached (Strong)

Scientific evidence leads us to believe that when a person uses a prism lens: “contrast sensitivity (CSR) is attenuated, visual acuity is reduced by at least two acuity rows, fusion and stereopsis are reduced and colour perception is affected” (Strong 3). “Unless the use of prisms becomes habitual, visual clues within the non-seeing field will be routinely unseen or ignored by the user when travelling in a challenging environment such as that of driving” (Strong 4).

A second type of device that can be used to help people compensate for their loss in vision is the use of additional mirrors placed strategically around the car to insure that the driver has an optimal view of his/her surroundings.

* There is a need for further research to be conducted to determine the effectiveness of bioptic telescopes.

Training

In many cases assessment and training with an occupational therapist, who has a specialized background in driver assessment, can be beneficial in helping an individual to learn how to scan their mirrors and use compensatory equipment to help minimize the effects of their loss in vision. If a person is using a compensatory device, undergoing a training program gives them experience in a new environment and helps them to understand the extent of their loss in vision. Training addresses issues of awareness and helps individuals with a loss in visual functioning to develop strategies that address their specific functional issues.

Accommodation

Phase I- Assessment

A review of jurisdictional best practices has been conducted for appeals where drivers have been identified as unfit to drive due to a vision deficit. Based on this review a number of steps for individual assessment have been identified, including the following:

a) Preliminary Assessment by the Licensing Authority

The initial screening includes a declaration of the disorder or functional impairment, followed by a vision test. The vision test includes:

Visual Acuity “Visual acuity should be tested using a Snellan chart or equivalent at the distance appropriate for the chart under bright photopic light conditions. Charts are designed to be used at 3 meters or greater are recommended” (“Determining Medical Fitness to Drive” 46).

Visual Field The confrontation testing method should be carried out to screen for visual defects. If a defect is detected, the individual should be referred to an ophthalmologist or optometrist for a full assessment. When a full assessment is required, the binocular visual field should be assessed using the III4e Goldmann type target or the closest equivalent. “The Esterman Functional Vision Test on the Humphrey Visual Field Analyzer or kinetic perimetry on the Goldmann perimeter are recommended” (“Determining Medical Fitness to Drive” 46).

After the initial vision test an in-clinic assessment may be conducted to determine a driver’s risk to road safety and decide what kind of assessment should be used to determine if they are eligible for a license. This decision is based on a number of factors to establish a driver’s level of risk. In order to conduct this review, the client may be asked to supply an additional report from an ophthalmologist, optometrist or other health care professionals. After information is obtained, the decision is made as to whether an individual functional driving assessment can be offered and if so, what form should that assessment take. Factors to be considered, which are consistent with the CMA guidelines, include:

- 1) Whether or not the vision condition is acquired or congenital.
- 2) Co-existing conditions that may affect fitness to drive.
- 3) Prognosis - Whether the condition is progressive or stable.
- 4) The stage of the condition.
- 5) Driving history - Driving experience/accident and conviction record.
- 6) Vision Reports - Extent and severity of deficit.
- 7) Reasons for wanting a driver’s license and for what class.

The decision is then made as to the type of assessment that can be offered:

- 1) None required- Person is fit to drive.
- 2) Standard road test conducted by a driver examiner.
- 3) Specialized functional assessment conducted by an occupational therapist.

- 4) No assessment provided- Not fit or condition cannot be tested by functional assessment. Assessment in this case is medical in nature, not functional (e.g. Seizure disorder). (Howie 1)

b) Third Party Assessment

The following describes the steps that should be followed where a specialized functional assessment is needed (i.e. No.3 above):

1) In-Clinic

This assessment is conducted by an occupational therapist and includes in-office psychometric exams that have been validated to assess driver performance. This assessment includes:

- 1) Vision tests.
- 2) An interview including the candidate's:
 - Knowledge of the rules of the road.
 - Level of awareness of the condition.
 - Description of their compensatory strategies, including devices and training requirements.

2) On-Road

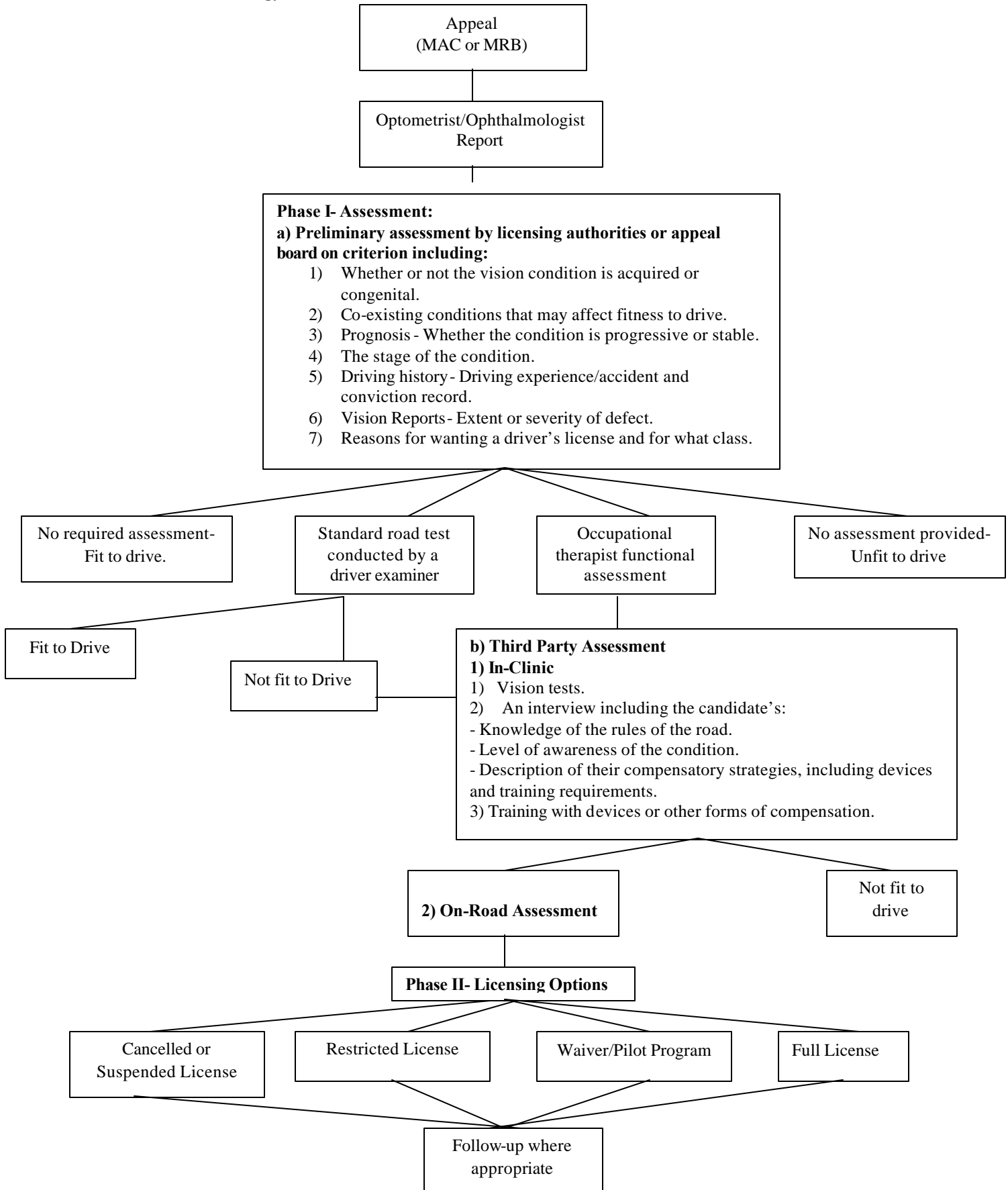
This assessment is designed by an occupational therapist in consultation with a driver examiner to exemplify situations that could become a challenge for a driver with a loss in visual functioning. The individual assessment can be used for persons with a loss in vision, as a means of determining if a client has developed satisfactory compensatory abilities that will enable him/her to safely operate a motor vehicle. Those functions listed in the "Visual Functions and Driving" section are the areas that should be sampled.

Phase II- Licensing Options

The licensing options that may be available within legal and policy limits to those who do meet the requirements for vision standards are:

- **Full License**- Person is fit to drive.
- **Waiver**- Generally a waiver permits a driver to hold a certain class of drivers license despite the fact that he/she may not meet the required medical/vision standards. The standards are "waived" provided the driver meets other prescribed conditions.
- **Pilot Program**- Pilot project are generally implemented to study the safety risks associated with an individual driving with a particular medical or vision condition. To be accepted into a pilot project there are specific requirements that must be met.
- **Restricted License**- Restrictions are commonly tailored to compensatory strategies and individual's are tested using these strategies. Restricted licenses may include: wearing eyeglasses or contact lenses, requiring the installation of equipment in the vehicle for driving, limiting the types of vehicles, requiring the presence of another license holder, limiting driving to daytime hours only, modifying the vehicle, no highway driving, not permitted to exceed 60 or 80 km/h, other including, but not limited to, area restrictions, adaptive equipment (mirrors etc) and restricted to radius of residence.
- **Cancelled or Suspended License**- Person is unfit to drive.

Best Practice Strategy for Individual Assessment



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