Revisions to the BC Guide for Physicians in Determining Fitness to Drive a Motor Vehicle

Thank you for taking the time to review the draft Peripheral Vascular Diseases (PVD) chapter.

Please provide any feedback to:
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Feedback due by:
MONDAY, DECEMBER 31, 2007

The Office of the Superintendent of Motor Vehicles (OSMV), in partnership with the British Columbia Medical Association (BCMA) is revising the BC Guide for Physicians in Determining Fitness to Drive a Motor Vehicle (the Guide) in order to ensure that it reflects changes in the case law and the best evidence available regarding medical conditions and fitness to drive.

Once the Guide chapters have been revised, the OSMV will create 2 separate documents:
1. a Physicians Handbook for use by physicians, and
2. an OSMV Driver Fitness Assessment Manual for use by the OSMV

The PVD chapter that you are reviewing will become the OSMV Driver Fitness Assessment Manual chapter. Once the OSMV Manual chapter is finalized, a much briefer chapter on PVDs will be created for the Physician’s Handbook.

Methodology for revisions to the current Guide
All revisions to the current Guide are completed using the same process:
1. Dr. Bonnie Dobbs, University of Alberta provides updated research regarding the medical condition and driving.
2. The chapter is revised by OSMV based on Dr. Dobbs’ research as well as a review of the Canadian Medical Association’s (CMA) Determining Fitness to Drive – A Guide for Physicians, and the Canadian Council of Motor Transport Administrators (CCMTA) National Safety Code (NSC).
3. The draft is published on the BCMA web site for review by physicians and on drivesafe.com for review by stakeholders and the broader road safety community. As well, specifically identified subject matter experts review the draft chapter and provide feedback for revisions.
4. The chapter is further revised and ultimately approved by the OSMV and the BCMA.
Background
The Office of the Superintendent of Motor Vehicles (OSMV), in partnership with the British Columbia Medical Association (BCMA) is revising the BC Guide for Physicians in Determining Fitness to Drive a Motor Vehicle (the Guide). The last major update to the 7th version of the Guide was completed in 1997. The current edition of the Guide is based on consensus opinion of practicing physicians including members of specialty sections within the BCMA. Since the 1997 edition, a number of significant changes have occurred which have created a need to undertake another major revision to the Guide.

Changes in the law
- Developing case law has established that government must consider fitness to drive on an individual basis. This means that, where possible, the OSMV must move away from the current diagnostic model for determining driver fitness to a primarily functional model for determining driver fitness. The functional model focuses on the individual’s functional ability to drive, including the individual’s ability to compensate for their condition, when determining ability to drive safely.

Strength of evidence
- The evidence for setting the standards in the current Guide is consensus opinion of subject-matter experts. While this type of evidence is valid, it is not as strong as evidence from epidemiological, experimental or descriptive studies. The OSMV is committed to revising the Guide so that, as much as current research allows for, the guidelines in the Guide are based on research studies. Nonetheless, expert opinion will remain a key component of establishing driver fitness standards.

Other jurisdictions
- Consistency with national and international standards is an important consideration for the OSMV. Commercial drivers, in particular, need to be able to drive in other jurisdictions; if the BC standards for driver fitness were to significantly depart from standards accepted in other jurisdictions, this may create a hardship for commercial drivers.
Peripheral Vascular Diseases

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

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

Peripheral Arterial Disease

1. OVERVIEW

For individuals with peripheral arterial disease, the chronic outcomes of the disease will rarely affect fitness to drive. However, those who experience severe claudication may have functional impairment sufficient to interfere with the lower extremity demands of operating a motor vehicle (e.g. awareness of foot placement, pedal pressure, motor strength, etc.).

About peripheral arterial disease

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

Individuals at-risk for Lower Extremity Peripheral Arterial Disease*

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

Prevalence

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

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

Peripheral arterial disease and co-morbidities

PAD is a common manifestation of systemic arteriosclerosis. Drivers with PAD often have additional arterial disease including CAD, carotid and cerebrovascular disease. Decisions about fitness to drive need to take into account not only the PAD but also the effects of co-morbidities and any treatments, e.g. medications taken for those co-morbidities.

Peripheral arterial diseases and driving

There are no studies that consider a relationship between PAD and risk of crash.

The symptoms of lower extremity PAD such as coldness or numbness in the foot or toes, and in the later stages pain while the extremity is at rest, may affect the sensory and motor functions required for driving.

In general, the degree of impact will be determined by disease severity. For example, individuals who are asymptomatic or have mild to moderate claudication are unlikely to have symptoms that would affect driving.

Individuals whose disease has progressed to the severe claudication stage or higher may have functional impairment sufficient to interfere with the lower extremity demands of operating a motor vehicle (e.g., awareness of foot placement, pedal pressure, motor strength, etc.).

### 2. EFFECT ON FUNCTIONAL ABILITY TO DRIVE

<table>
<thead>
<tr>
<th>Condition</th>
<th>Potential Impact on Driving</th>
<th>Primary Functional Ability Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral Arterial Disease</td>
<td>Persistent impairment</td>
<td>Sensory Motor</td>
</tr>
<tr>
<td>• intermittent claudication</td>
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<td></td>
</tr>
</tbody>
</table>

### 3. GUIDELINES

The following are general guidelines for determining fitness to drive. The specific circumstances of individual drivers should be taken into account when applying these guidelines.

**Private and Commercial class drivers**

- Drivers with significant sensory or motor dysfunction should be assessed by a road test.
- Drivers with successfully treated PAD may be permitted to drive any class of vehicle.
4. REASSESSMENT INTERVAL

The reassessment interval for a driver may be modified at the discretion of the OSMV based on the individual driver.

<table>
<thead>
<tr>
<th>Private</th>
<th>Commercial</th>
</tr>
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<tr>
<td>The frequency and nature of re-assessment should be determined on an individual basis in light of all relevant factors.</td>
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</table>

Abdominal Aortic Aneurysm

1. OVERVIEW

For individuals with an abdominal aortic aneurysm, acute complications may affect fitness to drive. The primary concern with an abdominal aortic aneurysm is the risk of rupture, which may result in sudden incapacitation.

About abdominal aortic aneurysms

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

Aortic dissection

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

Prevalence

Based on results from a population-based study completed in 2001, the prevalence of abdominal aortic aneurysms is approximately 9% for males and 2.2% for females. Prevalence increases with age and is higher in close family relatives of those affected. Prevalence also is higher in individuals with cardiovascular risk factors such as cigarette smoking, hypertension, and hypercholesterolemia.
Abdominal Aortic Aneurysms and driving

There are no studies that consider a relationship between aneurysms and risk of crash. The risk of rupture is the primary concern related to driving as rupture may result in sudden incapacitation. Aneurysms less than 5 cm in diameter have an annual incidence of rupture of 4.1%, which increases to 6.6% in aneurysms between 5 and 5.7 cm. Aneurysms larger than 7 cm in diameter have 19 percent per year incidence of rupture. This means that most patients (75%) with this size of aneurysm will have a rupture within 5 years.

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

The majority of aneurysms are asymptomatic and research suggests that there are few or no symptoms prior to rupture. There is limited data on the immediate functional outcomes of rupture (e.g. loss of consciousness). In the absence of firm data, it is assumed that most individuals experiencing a rupture lose consciousness almost immediately.

2. EFFECT ON FUNCTIONAL ABILITY TO DRIVE

The risk of rupture is the primary concern related to driving as rupture may result in sudden incapacitation.

<table>
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<tr>
<th>Condition</th>
<th>Potential impact on driving</th>
<th>Primary Functional Ability Affected</th>
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<tbody>
<tr>
<td>Abdominal Aortic Aneurysm</td>
<td>Episodic impairment</td>
<td>All – incapacitation</td>
</tr>
<tr>
<td>• Rupture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aortic dissection</td>
<td>Episodic impairment</td>
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3. GUIDELINES

The following are general guidelines for determining fitness to drive. The specific circumstances of individual drivers should be taken into account when applying these guidelines.

Note: a medically treated dissection once in the chronic phase can be managed by aortic diameter just like an AAA. A surgically treated dissection should be permitted to drive any class of vehicle with the support of the vascular surgeon.
Private and Commercial

It is an immediate contraindication to driving if a driver’s aortic aneurysm is at the stage of imminent rupture as determined by size, location or recent change [CMA]

### Private Vehicles – classes 5 to 8

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men with an abdominal aortic aneurysm may drive if:</td>
<td>Women with an abdominal aortic aneurysm may drive if:</td>
</tr>
<tr>
<td>• the aneurysm &lt; 6.5 cm and their condition is regularly reviewed</td>
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</tr>
<tr>
<td>• they have had surgery to repair an aneurysm.</td>
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<td>Men with an abdominal aortic aneurysm may not drive if:</td>
<td>Women with an abdominal aortic aneurysm may not drive if:</td>
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<td>• the aneurysm is 6.5 cm or greater</td>
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### Commercial Vehicles – classes 1 to 4

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### 4. REASSESSMENT INTERVAL

The reassessment interval for a driver may be modified at the discretion of the OSMV based on the individual driver.

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<td>Where the size of aneurysm does not preclude driving, re-assessment by a vascular surgeon should be done every 6 to 12 months depending on the rate of growth on the</td>
<td></td>
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</tbody>
</table>

DRAFT for BCMA review July 27 07
advice of the surgeon.
Deep Vein Thrombosis

1. OVERVIEW

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

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

Prevalence

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

2. EFFECT ON FUNCTIONAL ABILITY TO DRIVE

The most critical concern in individuals with DVT is pulmonary embolism which may result in sudden incapacitation.

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<th>Condition</th>
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<tbody>
<tr>
<td>Pulmonary embolism due to DVR</td>
<td>Episodic impairment</td>
<td>All - Incapacitation</td>
</tr>
</tbody>
</table>

3. GUIDELINES

The following are general guidelines for determining fitness to drive. The specific circumstances of individual drivers should be taken into account when applying these guidelines.

Private and Commercial class drivers

- It is an immediate contraindication to driving if a driver has acute deep venous thrombosis that is not yet treated
- Drivers with DVT may operate any class of motor vehicle provided appropriate treatment with an anticoagulant and a favourable recommendation from a physician
4. REASSESSMENT INTERVAL

The reassessment interval for a driver may be modified at the discretion of the OSMV based on the individual driver.

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