THE CARDIAC SOCIETY OF
AUSTRALIA AND NEW ZEALAND

Background

This document represents the views of the Cardiac Society of Australia and New Zealand. The guidelines were approved by the Council of the CSANZ on 29th November, 2002.

These notes have been compiled based on existing guidelines (Drivers and riders: Guidelines for Medical Practitioners, 3rd Edition 1993, Road and Traffic Authority NSW, pp 13-16; Medical Examinations of Commercial Vehicle Drivers, April 1997, Australasian Faculty of Occupational Medicine for the National Road Transport Commission and the Federal Office of Road Safety, pp 8-11); and guidelines "Fitness of Cardiac Patients to Hold Driving Licences, 27th August 1997".

The preparation of this paper was coordinated by Drs Paul Garrahy, Hugh McAlister and Ken Hossack.

CARDIOVASCULAR DISEASE

AND DRIVING

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Introduction

The purpose of these notes is to provide guidelines to medical practitioners required to assess the fitness of individuals with cardiovascular disease to hold a licence to drive a motor vehicle. These notes do not provide a comprehensive coverage of all cardiovascular conditions which may influence fitness to drive.

The aim of determining fitness to drive, is to minimise the risk to the individual, other drivers and third parties, while maintaining appropriate independence and employment for the individual. In the assessment of fitness to hold a licence, the medical practitioner should take into account the risk of serious accident due to sudden driver failure (1-3), any comorbidity (e.g. other vascular disease, diabetes mellitus, hyperlipidaemia), the type of vehicle to be driven, other factors (e.g. smoking, medications, alcohol, family history), and any current guidelines of relevant licensing authorities.

In these notes, fitness to drive, and fitness to hold a licence, are used synonymously.

Assessment by cardiologist

Individuals with cardiovascular disease who require assessment of fitness to drive should generally be reviewed by a consultant cardiologist or cardiothoracic surgeon. In some cases, advice not to drive might be reviewed after an appropriate period, and the advice not to drive might be withdrawn.

Private vehicles

Individuals who are assessed to be at high risk of sudden unexpected cardiovascular collapse should not drive.

Commercial vehicles

Commercial driving by individuals with cardiovascular disease should be restricted to those in whom the risk of cardiovascular collapse is minimal .

In the event of unfitness to drive, retraining and redeployment to duties commensurate with cardiovascular status, should be facilitated wherever possible.

Cardiovascular surgery

Individuals may be assessed for cardiovascular fitness to drive, only if they are free of musculoskeletal pain and other morbidity which could impair safe driving.

Myocardial ischaemia

In individuals with ischaemic heart disease, the probability of ischaemia while driving, rather than the mere presence of ischaemic heart disease, should influence the assessment of fitness to drive.

Angina pectoris (proven)

Individuals with angina pectoris at rest or on minimal exertion despite medical therapy, should not drive.

Private vehicle

An individual may be fit to drive, if:

* Angina pectoris is usually absent on mild exertion, and

* There are no electrocardiographic changes, arrhythmias, poorly controlled hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual with angina pectoris or previous angina pectoris may be fit to drive, if:

* There is no evidence on adequate completion of > 9 minutes Bruce protocol (or equivalent) stress testing of significant myocardial ischaemia at annual review, or

* There is evidence of myocardial ischaemia at a moderate or high level of stress at annual review, but at angiography there is less than 50% luminal diameter reduction in the left main coronary artery, and less than 70% luminal diameter reduction in any of the other major (left anterior descending, circumflex, or right) coronary arteries, or

* At angiography there is more than 70% luminal diameter reduction in one of the major (left anterior descending, circumflex, or right) coronary arteries, but less than 50% luminal diameter reduction in the left main coronary artery; or angiography is not performed, and there is minimal clinical evidence (history and stress testing) of myocardial ischaemia (exercise tolerance without symptoms for at least nine minutes on the Bruce protocol (or equivalent), less than 2mm ST depression at an adequate level of stress, absence of scintigraphic or echocardiographic evidence of large areas of reversible myocardial ischaemia, ejection fraction at rest of at least 40%, and absence of a moderate or large fixed perfusion defect.

Angina pectoris (suspected)

When angina pectoris is suspected, fitness to drive is as for an individual with proven angina pectoris, until and unless a diagnosis of angina pectoris is excluded.

Acute myocardial infarction

The period of convalescence after acute myocardial infarction will vary according to the amount of myocardial necrosis, the extent of obstructive coronary artery disease, the efficacy of any revascularisation procedure, functional capacity, evidence of reversible myocardial ischaemia, and predisposition to ventricular tachycardia. The timing of fitness to drive after myocardial infarction should be assessed in the context of convalescence generally.

Private vehicle

An individual may be fit to drive two weeks following myocardial infarction, if:

* Angina pectoris is usually absent on mild exertion, and

* There are no electrocardiographic changes, arrhythmias, poorly controlled anticoagulant therapy or blood pressure, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual may be fit to drive four weeks following myocardial infarction, and thereafter subject to annual review), if:

* Left ventricular ejection fraction is greater than 40%, and

* There is no evidence on adequate stress completion of 9 minutes Bruce protocol (or equivalent) testing of significant myocardial ischaemia , or

* There is evidence of myocardial ischaemia at a moderate or high level of stress, but at angiography there is less than 50% luminal diameter reduction in the left main coronary artery, and less than 70% luminal diameter reduction in all of the other major (left anterior descending, circumflex, or right) coronary arteries.

Coronary artery bypass grafting

Fitness to drive after coronary artery bypass surgery is influenced by completeness of revascularisation, functional capacity, evidence of reversible myocardial ischaemia and presence of musculoskeletal or other pain.

Private vehicle

An individual may be fit to drive four weeks following coronary artery bypass grafting, if:

* Angina pectoris and dyspnoea are usually absent on mild exertion, and

* There is no musculoskeletal or other pain which would interfere with driving, and

* There are no electrocardiographic changes, arrhythmias, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual may be fit to drive three months following coronary artery bypass grafting, and thereafter subject to annual review, if:

* There is no evidence on adequate > 9 minutes of Bruce protocol (or equivalent) stress testing (electrocardiographic, echocardiographic or scintigraphic) of significant myocardial ischaemia, or

* There is evidence of myocardial ischaemia at a moderate or high level of stress, but at angiography there is complete revascularisation, or

* At angiography there is incomplete revascularisation, but there is minimal clinical evidence (history and stress testing) of myocardial ischaemia (exercise tolerance without symptoms for at least nine minutes on the Bruce protocol (or equivalent), less than 2mm ST depression at an adequate level of stress, absence of scintigraphic or echocardiographic evidence of large areas of reversible myocardial ischaemia, ejection fraction at rest of at least 40%, and absence of a moderate or large fixed perfusion defect.

Coronary angioplasty

The period of convalescence after coronary angioplasty will vary according to symptoms and extent of disease prior to angioplasty, efficacy and complications of angioplasty, functional capacity and evidence of reversible myocardial ischaemia after angioplasty. The timing of fitness to drive after coronary angioplasty should be assessed in the context of convalescence generally.

Private vehicle

An individual may be fit to drive two days following coronary angioplasty, if:

* Angioplasty was not associated with acute myocardial infarction (immediately prior to or after angioplasty), and

* Angina pectoris is usually absent on mild exertion, and

* There are no electrocardiographic changes, arrhythmias, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual may be fit to drive four weeks following coronary angioplasty, and thereafter subject to annual review, if:

* Angioplasty was not associated with acute myocardial infarction (immediately prior to or after angioplasty) and there is no evidence on adequate >9 minutes Bruce protocol (or equivalent) stress (exercise or pharmacological) testing (electrocardiographic, echocardiographic or scintigraphic) of myocardial ischaemia, or

* There is evidence of myocardial ischaemia at a moderate or high level of stress, but at angiography there is complete revascularisation, or

* At angiography there is incomplete revascularisation, but there is minimal clinical evidence (history and stress testing) of myocardial ischaemia (exercise tolerance without symptoms for at least nine minutes on the Bruce protocol (or equivalent), less than 2mm ST depression at an adequate level of stress, absence of scintigraphic or echocardiographic evidence of large areas of reversible myocardial ischaemia, ejection fraction at rest of at least 40%, and absence of a moderate or large fixed perfusion defect.

Hypertension

The aim of treatment for hypertension is to maintain sitting blood pressure equal to or less than 140 mmHg systolic and equal to or less than 90 mmHg diastolic.

Private vehicle

An individual may be fit to drive unless treatment causes symptomatic postural hypotension or impaired alertness, and provided that there is no other condition which would render the individual unfit to drive.

Commercial vehicle

An individual is unfit to drive, if:

* Sitting blood pressure is consistently equal to or greater than 200 mmHg systolic, or equal to or greater than 110 mmHg diastolic, or

* Treatment causes symptomatic postural hypotension or impaired alertness, or

* There is end organ damage (cardiac, cerebral, retinal or renal) which would otherwise render the individual unfit to drive.

Arrhythmias and conduction abnormalities

Individuals with recurrent or persistent arrhythmias causing presyncope or syncope are unfit to drive. Fitness to drive may be assessed following effective treatment and an appropriate symptom-free interval.

Cardiac arrest

Cardiac arrest may occur secondary to bradycardia or asystole, ventricular tachycardia or fibrillation, or if cardiac output is reduced in association with other arrhythmias. Driving should be resumed only when the underlying cause(s) for cardiac arrest have been effectively treated, and the individual has remained asymptomatic for 6 months.

Private vehicle

An individual may be fit to drive following an arrest-free interval of at least six months after a cardiac arrest, provided that there is no other condition which would render the individual unfit to drive. A shorter period may be considered, subject to specialist assessment, if the cardiac arrest has occurred within 48 hours of an acute myocardial infarction, or if the arrhythmia causing the cardiac arrest has been addressed by radiofrequency ablation, surgery, or by pacemaker implantation.

Commercial vehicle

An individual is unfit to drive, unless:

* Cardiac arrest had occurred within two days of acute myocardial infarction, and the individual subsequently did not have inducible ventricular tachycardia at electrophysiological study, and there was no other condition which would render the individual unfit to drive, or

* Cardiac arrest had been associated with an arrhythmia which was subsequently cured by surgery, (or) catheter ablation or pacemaker implantation, and the individual subsequently did not have inducible ventricular tachycardia at electrophysiological study, and there was no other condition which would render the individual unfit to drive, or

* Cardiac arrest had been associated with factors which could be avoided in the future, and there was no other condition which would render the individual unfit to drive.

Fitness to drive requires specialist assessment following a symptom-free interval appropriate to the above categories (e.g. 4 weeks following myocardial infarction or pacemaker implantation, 6 months for other categories and thereafter annually.

Syncope and presyncope

Presyncope and syncope may occur secondary to arrhythmias, medications and other factors. Fitness to drive should be assessed only when the underlying cause(s) for presyncope and or syncope have been identified and effectively treated, and the individual has remained asymptomatic for an adequate period.

Private vehicle

In the absence of demonstrated arrhythmias and serious structural heart disease, an individual may be fit to drive following a symptom-free interval of at least two months after syncope, provided that there is no other condition which would render the individual unfit to drive.

Commercial vehicle
Return to driving requires specialist assessment.
An individual is unfit to drive, unless:

* All the factors leading to presyncope or syncope, have been identified and treated effectively and provided that there is no other condition which would render the individual unfit to drive. Following unexplained syncope, provocation tilt table testing and investigation for arrhythmia should be considered.

Fitness to drive may be assessed following a symptom-free interval of at least three months after syncope, and thereafter annually.

Pacemaker

Private vehicle

An individual may be fit to drive two weeks following implantation of a pacemaker provided there is no other condition which would render the individual unfit to drive.

Commercial vehicle

An individual may be fit to drive one month following implantation of a pacemaker, and thereafter subject to annual review, if:

* There are normal haemodynamic responses at a moderate level of exercise, and

* There is no other condition which would render the individual unfit to drive.

Automatic Implantable cardioverter defibrillator (AICD)

Private vehicle

Patients in whom an AICD is implanted for an episode of cardiac arrest are unfit to drive unless asymptomatic for six months. An individual may be fit to drive two weeks following prophylactic implantation**,** or planned generator change of an AICD provided there is no other condition which would render the individual unfit to drive.

Commercial vehicle

An individual with an implanted automatic cardioverter defibrillator is unfit to drive.

Other arrhythmias, and electrocardiographic abnormalities

Atrial fibrillation may be secondary to myocardial ischaemia, valvular or other heart disease, and thyrotoxicosis. The assessment of fitness to drive should take account of factors which may cause or precipitate atrial fibrillation, the occurrence of dizziness, syncope or other symptoms during episodes and whether treatment is likely to abolish atrial fibrillation.

Supraventricular and ventricular tachycardia may be due to reentry utilising electrical pathways which may be modified medically, or cured by catheter ablation or surgery. The assessment of fitness to drive should take account of potentially curative therapy.

Conduction abnormalities may occur in isolation, or associated with other heart disease, or drug therapy.

Private vehicle

Individuals with arrhythmias, or other electrocardiographic abnormalities, which do not cause presyncope or other symptoms which might impair driving, may be fit to drive, if:

* There is no other condition which would render the individual unfit to drive.

Commercial vehicle

Individuals with arrhythmias, or other electrocardiographic abnormalities which could cause presyncope or other symptoms which might impair driving, are not permitted to drive. Such persons may be fit to drive, subject to annual specialist review, if:

Symptomatic arrhythmia control (or radiofrequency ablation/surgical cure) is achieved for at least 3 months and

- There is no other condition which would render the individual unfit to drive. and
- The left ventricular ejection fraction is >0.40 and
- The driver can complete 9 minutes of the Bruce protocol (or equivalent) without evidence of significant myocardial ischaemia.

Valvular heart disease

Private vehicle

An individual may be fit to drive, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, anticoagulant therapy, hypertension, or other conditions which would render the individual unfit to drive.

An individual may be fit to drive four weeks following successful valve surgery, if:

* There is no musculoskeletal or other pain which would interfere with driving, and

* There are no electrocardiographic changes, arrhythmias, cardiac failure, anticoagulant therapy, hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual is unfit to drive if:

* There is any clinical evidence of valvular disease, with or without surgical repair or replacement, associated with dyspnoea, chest pain, symptomatic arrhythmia, or dizziness, or a history of embolism, or

* There are electrocardiographic changes, arrhythmias, cardiac failure, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive,

* There is echocardiographic evidence of moderate or severe mitral or aortic valve stenosis.

An individual may be fit to drive, subject to annual review, if:

* There is only mild valvular disease of no haemodynamic significance, and there are no conditions which would otherwise render the individual unfit to drive.

An individual may be fit to drive three months following successful valve surgery, and thereafter subject to annual review, if:

* There is no evidence of valvular dysfunction and there are no electrocardiographic changes, arrhythmias, cardiac failure, anticoagulant therapy, hypertension, or other conditions which would render the individual unfit to drive.

Cardiac failure and cardiomyopathy

Private vehicle

An individual may be fit to drive, if:

* Dyspnoea is usually absent on mild exertion, and

* There are no electrocardiographic changes, arrhythmias, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive.

An individual may be fit to drive six weeks following successful heart and or lung transplantation, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual with heart failure, hypertrophic cardiomyopathy or symptomatic cardiomyopathy is unfit to drive.
After review by a cardiologist, an individual may be fit to drive if:

- Asymptomatic and
- The left ventricular Ejection Fraction is >0.4, and
- The person is able to complete 9 minutes of the Bruce protocol (or equivalent) without significant cardiac symptoms or hypotension
- And, in the presence of hypertrophic cardiomyopathy, if asymptomatic, without severe LV hypertrophy, a family history of sudden death or ventricular arrhythmia on Holter testing

Anticoagulation

Private vehicle

An individual may be fit to drive, if:

* Anticoagulation is maintained at the appropriate degree for the underlying condition, and

* There are no electrocardiographic changes, arrhythmias, cardiac failure, hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

An individual may be fit to drive, subject to annual review, if:

* Anticoagulation is maintained at the appropriate degree for the underlying condition, and

* There are no electrocardiographic changes, arrhythmias, cardiac failure, hypertension, or other conditions which would render the individual unfit to drive.

Other cardiovascular conditions

Congenital heart disease

Private vehicle

An individual may be fit to drive six weeks following successful surgery for congenital heart disease, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive.

Commercial vehicle

Individuals with asymptomatic minor congenital heart disorders (including mild pulmonary stenosis, small atrial or ventricular septal defect, bicuspid aortic valve without stenosis, and mild coarctation of the aorta without aortic aneurysm), may be fit to drive, subject to annual review, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive.

An individual may be fit to drive three months following successful surgery for uncomplicated congenital heart disease, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive, and

* There is no evidence on adequate (greater than 9 minutes of the Bruce protocol or equivalent) stress testing of myocardial ischaemia..

Heart Transplant

Private vehicle

An individual may be fit to drive three months following successful surgery subject to review by transplant cardiologist.

Commercial vehicle

An individual may be fit to drive six months following successful heart transplant and subject to review by transplant cardiologist if there is no evidence of resting left ventricular dysfunction (LVEF < 50%), inducible ischaemia or transplant coronary artery disease (angiographic stenosis of > 70%). Licence to be valid for 12 months, with licence renewal subject to annual review by transplant cardiologist.

Aneurysm

Private vehicle

An individual with thoracic or abdominal aortic aneurysm, or other vascular abnormality at risk for dissection or rupture, is unfit to drive. An individual may be fit to drive six weeks following successful surgery.

Commercial vehicle

An individual with thoracic or abdominal aortic aneurysm, or other vascular abnormality at risk for dissection or rupture, is unfit to drive. The possibility of returning to driving after successful surgery may be reviewed three months after such surgery, and thereafter annually, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, poorly controlled anticoagulant therapy or hypertension, or other conditions which would render the individual unfit to drive, and

* There is no evidence on adequate (greater than 9 minutes of the Bruce protocol or equivalent) stress testing of myocardial ischaemia.

Other cardiovascular disease

For example, pulmonary embolism or peripheral vascular disease

Private vehicle

An individual may be fit to drive, provided that symptoms are absent on mild exertion, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, anticoagulant therapy, hypertension, or other conditions which would render the individual unfit to drive, and

* There is no evidence on adequate stress (exercise or pharmacological) testing (electrocardiographic, echocardiographic or scintigraphic) of myocardial ischaemia.

Commercial vehicle

An asymptomatic individual may be fit to drive, subject to annual review, if:

* There are no electrocardiographic changes, arrhythmias, cardiac failure, anticoagulant therapy, hypertension, or other conditions which would render the individual unfit to drive, and

* There is no evidence on adequate stress (exercise or pharmacological) testing (electrocardiographic, echocardiographic or scintigraphic) of myocardial ischaemia.

Conclusion

Careful consideration must be given to all factors, when assessing the fitness to drive of individuals with cardiovascular disease. Consultant cardiological and or cardiothoracic surgical opinion should be sought in most cases.

References

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