

MINUTES OF THE SECRETARY OF STATE FOR TRANSPORT'S HONORARY  
MEDICAL ADVISORY PANEL ON DRIVING AND DISORDERS OF THE  
CARDIOVASCULAR SYSTEM HELD ON WEDNESDAY, 28TH APRIL 2004.

Present: Dr H Swanton  
(Chairman)  
Mr C J Hilton  
Dr J E Burns  
Dr M Anderson  
Dr M J Griffith  
Dr D R Holdright  
Professor A Bradbury  
Dr L D R Smith  
Dr P M Schofield

Lay Members: Mr P Tait  
Mr R Yates

Ex-Officio Dr M Harbinson Secretary, British Nuclear Cardiology Society  
Dr Nicoleta L Read Research Manager, DfT  
Dr T Carter Chief Medical Adviser, DfT  
Dr H G Major Senior Medical Adviser, DVLA  
Dr J G G Hanley Medical Adviser, DVLA  
Dr I Perez Medical Adviser, DVLA  
Mr I Hughes SEO, DMG, DVLA  
Dr C Jenkins Panel Secretary, Medical Adviser, DVLA

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1. Apologies for Absence

1.1 Apologies were received from Dr D Mills.

2. Myocardial Perfusion Scanning

The Panel considered the following papers:  
NICE guidelines November 2003 - Myocardial perfusion scintigraphy  
Heart January 2004 Vol 90 Supplement - procedure guidelines for radionuclide  
myocardial perfusion imaging

2.1 There was a presentation by the secretary of the British Nuclear Cardiology Society (BNCS). The physiological basis for radionuclide myocardial perfusion scanning was outlined, and the prognostic implications of a fixed and a reversible ischaemic defect were explained. Perfusion scanning is a functional test and therefore it is possible to have wide spread atheromatous change identified by angiography and still have a normal perfusion scan. Because it is a functional test, the perfusion scan is, together with the Left Ventricular Ejection Fraction (LVEF), the best prognostic indicator for cardiovascular risk.

2.2 The isotope is injected intravenously and the uptake depends on the vascular perfusion of the myocardium and on the tissue viability. The resting study determines how much of the living myocardium there is. The stress study is carried out after either exercise or pharmacological stress and the further ischaemic changes are

superimposed on to the resting study to provide a differential. The scan examines 9 sectors of the heart in vertical long axis, horizontal long axis and vertical short axis. The extent and the depth of the defects identified combine to produce a prognostic indication.

2.3 Pharmacological stress is produced by adenosine or dipyridamole, which will dilate normal coronary arteries 3-4 times. Stenotic arteries cannot dilate. Dobutamine (commonly used for stress echocardiography) can also be used but is less commonly used and gives less information. In addition, a high heart rate can degrade the quality of the information obtained from the scan,

2.4. The Panel was advised that in the presence of a fixed ischaemic defect the best prognostic indicator was the left ventricular function measured by LVEF but that this would only be provided at the time of the perfusion scan with a 'gated' scan. It was therefore recommended that in future DVLA should whenever possible commission only gated myocardial perfusion scans. Not all centres have the appropriate equipment for this.

2.5. The identification of a reversible ischaemic defect indicates high cardiac risk, up to 20% per annum with multi vessel disease. A normal scan is associated with a 0.8% per annum risk of an acute cardiac event. A scan with 2 out of 9 segments affected by reversible defect would carry probably a cardiac risk level that is higher than the 2% per annum risk threshold for Group 2 licensing. This would not necessarily equate to a 'high' risk clinically. More than 1 affected segment would therefore appear to be unacceptable for Group 2 licensing. Semi-quantitative methods of assessing ischaemic risk have not been validated for a UK population, although some systems give an estimate of the amount of myocardium at risk, which may be helpful

2.6. Artefacts are usually fixed defects so do not have prognostic function other than in the presence of a reduced LVEF. Generally speaking an LVEF of <45% would be considered abnormal with the risk worsening as the LVEF falls. DVLA currently have a level of acceptability of 'abnormality' with a cut off at 40%. Most artefacts are removed with the use of gating. Not all centres have gating available on their cameras.

2.7 It was confirmed that the dynamic exercise test is still recommended as the gold standard and test of choice for prognostic testing, but with an indeterminate ECG, from such conditions as Left Bundle Branch Block (LBBB), the perfusion study will give much more information.

2.8 It is also suggested that because of the high false positive rate in exercise ECG in women, perfusion scan should be the test of choice for women.

2.9 A recent Review article [Myocardial perfusion scintigraphy: the evidence Underwood et al EJNM 2004; 31:261-291] confirms the prognostic significance of MPS in the detection of reversible defect.

Protocol and standards

2.10 The attention of the Panel was drawn to the protocols recommended by the BNCS in the paper from Heart (cited above). It was suggested that these could be a basis for any standards for testing commissioned by DVLA. Vasodilator stress using adenosine or dipyridamole (persantin) is the method of choice. In addition, DVLA should require that the NICE guidelines (also cited above) were met. A standard format for reporting is recommended by BNCS. It was recommended that centres should be doing at least one session (4-5 cases) per week.

2.11 It was suggested that the Panel might wish to consider the advice that DVLA should only commission 'gated' scans in the future, to ensure that the LVEF is

provided. (However this would have to be balanced against availability). Currently although an LVEF of less than 0.4 is a bar to any Group 2 licensing it is only normally routinely requested in Group 2 drivers with a history of symptomatic arrhythmia.

2.12 The Panel was also advised that a wide range of fees had been quoted from different centres. Variables included the local price for the isotope, the number and type of scans carried out (more per session per centre would reduce the individual cost of the isotope). Other factors were staffing costs and equipment type and costs. DVLA will consider appropriate funding levels in discussion with BNCS.

Interpretation of the Myoview

2.13 There was considerable discussion with respect to the qualitative interpretation of reports. It was agreed that either a fixed defect with an LVEF currently considered as acceptable for Group 2 licensing purposes (i.e. 0.4 or greater) OR a 'minor' reversible defect (as defined in the guidelines) affecting only 1 out of the 9 segments, could be considered acceptable for licensing purposes.

### 3. Annual Report 2003

3.1 The meeting noted the Annual report of the Secretary of State's Honorary Medical Advisory Panel for Driving and Cardiovascular Disorders. A typographical error was noted in paragraph 4.1 – 'infraction' should read 'infarction'. With this proviso, the report was approved.

3.2 The meeting received the draft minutes of the Panel Chairmen's meeting held on 12 February 2004.

### 4. Minutes of the Cardiac Panel Meeting of 21st October 2003.

4.1. The Minutes of the meeting of the Secretary of State's Honorary Advisory Panel on Driving and Cardiovascular Disorders, held on 21 October 2003, were approved.

### 5. Matters Arising from the Minutes of the Cardiac Panel of 21st October 2003

#### 5.1 4.3(a) Angiogram standard

The Panel has previously advised that for an angiogram result to over-ride an abnormal exercise test, the vessels must be 'angiographically normal'. However, in the absence of any other quantified advice, the existing advice in the At A Glance guide to Fitness to Drive (AAG) with respect to angiography indicates a more lenient standard.

5.2 The paper on which the previous decision had been made would be recirculated to the Panel. However it was felt that more up to date data were required on the prognostic indication of lesions in one, two or three vessels, identified on angiography, in order to inform any change in the current standard. The Panel advised that there is a need for a new literature search and further discussion.

5.3 In the meantime, the Panel advised that the angiographic criteria indicated in AAG are only acceptable for licensing purposes if all other current criteria can be met, i.e. applies to incidental angiography submitted in the course of medical enquiry. Angiograms that are submitted, as a challenge, after revocation/refusal on the strength of an exercise ECG/thallium scan should be submitted to a Panel member for an opinion as to whether the evidence provided would allow reversal of the licensing decision. In general changes in myocardial perfusion will not be seen with stenosis <50% and only in a proportion of cases with stenosis of 50-70%. Above 70% it is

expected that a perfusion defect would be noted. Thallium may in theory detect slightly more defects than technetium.

Entry in AAG to read:

**CORONARY ANGIOGRAPHY** (within the preceding 12 months).

In coronary heart disease, angiography is not required for (re-)licensing purposes. If angiography has been undertaken, all other current criteria must be met. (Re-)licensing will not normally be permitted if the left ventricular ejection fraction is less than 0.4 on contrast angiography (or on any other measurement) OR there is significant, proximal unrelieved coronary arterial stenosis affecting the left main stem, equal to or greater than 50% diameter and/or the proximal Left Anterior Descending coronary artery equal to or greater than 75% diameter, as measured by quantitative coronary angiography.

Item 4.2. The Panel received the following paper, as background information about the prognostic significance for the Duke's score. The use of this score is currently suspended by DVLA pending the provision of further data.

Long Term Outcome of Patients with Intermediate-Risk Exercise Electrocardiograms Who Do Not Have Myocardial Perfusion Defects on Radionuclide Imaging  
Gibbons et al (Circulation.1999;100:2140-2145)

Item 6.3 The Panel received the following paper in support of the advice previously given with respect to the safety of discontinuing anti-anginal and cardio-protective medication prior to exercise testing.

Exposing Patients With Chronic, Stable, Exertional Angina to Placebo Periods in Drug Trials  
Glasser et al (JAMA.1991;265:1550-1554)

Item 11 CAA Fitness Standard

The SMA had brought to the attention of the CAA the Panel's concern with regard to Group 1 standards and the private pilot's licence. The Group 1 fitness standards apply only to non-passenger carrying licences.

6. Minutes of the Combined Neuro-Cardiac Meeting of 20th November 2003.

6.1 6.1. The Minutes were approved for the Meeting of the combined Neurological and Cardiovascular Panels, held on the 20th November 2003.

7. Matters Arising from the Combined Neuro-Cardiac Meeting

Item 3.11

7.1 The Panel was asked to clarify whether the coronary risk for anyone with any degree of carotid stenosis is great enough to require 3 yearly exercise testing, as minuted. The advice previously given by the Neurology Panel in 2002 was that only those with asymptomatic carotid stenosis severe enough to justify endarterectomy (i.e. >70% stenosis) would have this level of coronary risk.

7.2 The Panel noted that the reported degree of stenosis could be affected by the imaging technique used. Whilst the opinion was expressed that the risk of coronary artery disease was high in the presence of any carotid artery stenosis, it was subsequently accepted that a small amount of plaque indicated a low risk of coronary

artery disease. It was noted that the previous threshold of 70% stenosis, for endarterectomy, was in fact reducing in practice to a 50% stenosis threshold.

7.3 Doppler studies would not normally be carried out without clinical indication i.e. the patient is already symptomatic and thus at higher cardiac risk. It was the opinion of the Panel that the presence of any stenosis severe enough to justify intervention would have a high cardiac risk and that this should indicate the requirement for exercise testing every 3 years, even if intervention was not carried out, for other reasons.

#### Group 1 Group 2

Carotid artery stenosis DVLA need not be notified If the level of stenosis is severe enough to warrant intervention, the exercise test requirement must be met.

#### Item 3.13

7.4 The Ankle:Brachial Pressure Index (APBI) is a non-invasive measurement and, with appropriate training, acceptable levels of accuracy and reproducibility can be obtained. The Panel received the draft of an extensive literature search carried out by a Panel member, with a meta-analysis of papers studying ABPI and cardiovascular risk, which indicated the possible value of this measurement as a screening tool for cardiovascular risk. The Panel member was thanked for his very useful contribution.

7.5 The Panel confirmed that this supported their previous request for a longitudinal study linking the ABPI with both exercise testing and the Duke's score, to ascertain its possible value as a prognostic indicator.

#### 8. HOCM

8.1 At the last meeting the Panel had suggested that the debarring conditions for HOCM could be considered separately i.e. licensing could be allowed if only a certain number were present. This appeared to presuppose that each condition had an equal risk factor. The Chairman had therefore agreed subsequently to seek further opinion.

8.2 The following papers were provided for background:

(i) Non-Sustained Ventricular Tachycardia in Hypertrophic Cardiomyopathy: An Independent Marker of Sudden Death Risk in Young Patients Monserrat et al J Am Coll Cardiol.2003;3;42(5):873-9

(ii) Relation between severity of left-ventricular hypertrophy and prognosis in patients with hypertrophic cardiomyopathy Elliott et al Lancet.2001;357:420-24

(iii) Sudden Death in Hypertrophic Cardiomyopathy: Identification of High Risk Patients Elliott et al J Am Coll Cardiol.2000;36(7):2212-8

(iv) Magnitude of Left Ventricular Hypertrophy and risk of sudden death in hypertrophic cardiomyopathy Spirito et al N Engl J Med.2000;342:1778-85

(v) Hypertrophic Cardiomyopathy: Management, Risk Stratification, and Prevention of Sudden Death McKenna et al Heart.2002;87:169-76.

8.3 The Panel advised that criterion 2 in the current AAG should be modified to indicate sudden and unexpected death from presumed HCM. After discussion, it was agreed that no other change to the wording of the criteria was required.

8.4 The Panel confirmed that where only one criterion was not met the risk factor of a sudden cardiac event was considered to be 1%. Where more than one of the criteria were not met, the risk factor increases to 5% and the patient would clinically qualify for the insertion of a defibrillator. This level of risk is considered unacceptable for Group 2 licensing. This clinical decision was not dependent on each of the criteria having an equal risk factor. The previous recommendation of the panel from the meeting of 21 October 2003 (that in an asymptomatic driver no more than 1 risk factor was allowed) was therefore confirmed.

#### Group 1 Group 2

#### HYPERTROPHIC CARDIOMYOPATHY (HCM)

(See also arrhythmia, pacemaker and ICD sections)

#### HYPERTROPHIC CARDIOMYOPATHY (HCM)

(See also arrhythmia, pacemaker and ICD sections)

Disqualifies from driving if symptomatic.

Re/licensing will be permitted if no more than one of the following criteria are not met, and there is no other disqualifying condition.

- 1) There is no family history of sudden premature death from presumed HCM
- 2) The cardiologist can confirm that the HCM is anatomically mild
- 3) No serious abnormality of heart rhythm disturbance has been demonstrated i.e. ventricular tachy-arrhythmia excluding isolated Ventricular Pre-Excitation Beats
- 4) Hypotension does not occur during exercise testing

#### 9. Aneurysm

##### (i) Use of Exercise Testing In Drivers With Aneurysmal Disease

9.1 The Panel was asked to consider an enquiry from a consultant concerning the use of exercise testing in drivers with aneurysmal disease. The Panel noted the high risk of coronary artery disease both with Peripheral Arterial Disease (PAD) and with aneurysmal disease. In addition, there is a 3-4 times greater risk of abdominal aortic aneurysm in the presence of PAD. Where there is large aneurysm, cause of death is more likely to be from myocardial infarction than the aneurysm. It was felt that there was likely to be a similar cardiovascular risk in the presence of aneurysmal disease and peripheral arterial disease. It was agreed that the appropriate Panel member would respond to the enquiry.

##### (ii) UK Mortality Rate Post Aortic Root Surgery With Marfan's Syndrome

9.2 This item is deferred to the next meeting whilst further information is obtained. It was confirmed that the Group 2 bar to driving after having had aortic root surgery applied only to those with Marfan's syndrome. The AAG advice with respect to other drivers who had had successful aortic root surgery was confirmed.

##### (iii) Size Of Aneurysm Associated With 20% Mortality Rate (Group 1)

9.3 The Panel was advised that there are no statistics available giving information with respect to the size of aortic aneurysm giving 20% mortality; the current advice with respect to Group 1 drivers remains unchanged.

(iv) Advice on standards for abdominal aortic aneurysm.

9.4 It was advised that as the risk factors were similar to those with PAD, the condition of abdominal aortic aneurysm should be again included with PAD in AAG.

## 10. Correspondence

Significance Of Raised Cardiac Enzymes Post Angioplasty – (Deferred From Last Meeting)

10.1 The Panel was asked to consider an enquiry from a clinician with respect to the significance of raised cardiac enzymes after angioplasty. It was felt that this was not measured routinely unless there was a clinical event post angioplasty. The occurrence of a clinical event would indicate that this was not successful angioplasty and this in itself would remove them from the low risk group requiring only 1 week off post successful angioplasty after non-ST elevation Myocardial infarction. It was therefore agreed that any enzyme leak post angioplasty would require the 1 month off driving.

(ii) Blood Pressure As An Isolated Risk Factor

10.2 The Panel noted an enquiry from a clinician with respect to the relevance of blood pressure as an isolated risk factor. The secretary had replied to the effect that it remained the opinion of the Panel that the level of blood pressure as specified did represent a high risk of sudden cardiac event. In addition cardiac risk factor assessment as carried out in general practice could not be undertaken, as this would introduce an element of age related barrier.

10.3 The Panel approved the reply.

## 11. Requirement For Continuing 3 Yearly Myocardial Perfusion Scan With PAD (Issued After a Normal Myoview)

11.1 The Panel was asked to comment on the current requirement for repeating cardiac investigation 3 yearly for a Group 2 driver with Peripheral Arterial Disease (PAD). Where an exercise test could not be successfully completed because of physical non-cardiac difficulty, a myocardial perfusion scan is requested. The Panel was asked whether a longer interval- e.g. 5 years, to coincide with the licensing renewal term, could be introduced for those drivers found to have a normal scan.

11.2 Dr Harbinson advised that as yet there is only a small amount of data available for patients, with known peripheral arterial disease who have normal scans, who have been followed up for more than 3-4 years. There is certainly no robust data beyond 5 years. In addition, the warranty of a normal scan may possibly last less in patients with diabetes or known significant IHD. In the absence of this information, the Panel was unable to advise that a longer interval between investigations can be introduced for these Group 2 drivers.

## 12. Congenital Heart Disease and Risk

12.1 The Panel considered a Paper from a Panel member, reviewing the suggested licensing requirements for Group 1 and Group 2 drivers with congenital cardiac conditions. There was discussion on the need for an up to date assessment or report from a consultant cardiologist when a condition was first declared or the Group 2 licence was first applied for. It was felt that this would depend on the licence applied for and the age of the applicant. Subject to the correction of some typographical errors, and the clarification of some points it was agreed that the information could be included as an annexe to AAG. The Panel member was thanked for her contribution.

## 13. Heart Valve Disease

13.1 The Panel was asked to advise on whether DVLA should adopt standards for gradients in valve disease e.g. if there is a level which could be assessed as giving rise to a 2% risk of sudden cardiac event.

The following paper was considered:

Recommendations on the management of the asymptomatic patient with valvular heart disease. Iung et al European Heart Journal. 2002;23:1253-1266

13.2 The Panel advice remains that it is the symptomatology that is of relevance rather than the gradient. The paper confirms that the level of 2% risk is reached when the patient becomes symptomatic.

13.3 The guidelines in AAG do not need to be changed.

14. Outcomes Of Cases From Previous Meetings

14.1 The Panel was updated on some earlier cases that had been discussed (6/11/02 and 7/5/03.)

14.2 In addition the Panel was advised that there had been no appeals or complaints lodged with reference to cardiac cases since the last Panel meeting.

15. Cases

Case 1/04/04

This 57 year old Group 2 driver had a history of HOCM, without evidence of left ventricular outflow gradient. 24-hour tape showed sinus rhythm with intermittent left bundle branch block morphology. 9 minutes of Bruce protocol had been completed (stopped with fatigue) with no hypotensive response and normal heart rate. The single risk factor was therefore the arrhythmia.

In the light of the earlier discussion, the Panel confirmed that his risk factor was no greater than 1% and that it was appropriate to issue a licence, subject to annual review

Case 2/04/04

This 39 year old Group 1 licence holder was applying for a first provisional Group 2 licence. He was found to have bradycardia secondary to congenital complete heart block.

Panel consider the following paper:

Isolated Congenital Arterioventricular Block in Adult Life Michaëlsson et al Circulation 1995;92:442-449.

Panel confirmed the advice that un paced congenital complete heart block was a bar to Group 2 driving, but that a Group 1 driver could be licensed if asymptomatic. A section is to be added in AAG

Group 1 Group 2

Unpaced congenital complete heart block May drive if asymptomatic Bars whether symptomatic or asymptomatic

Case 3/04/04

This 56 year old Group 2 driver had Chronic Obstructive Pulmonary Disease with sleep apnoea controlled with CPAP. In addition, he had atrial fibrillation treated with Amiodarone and Warfarin. Unsuccessful cardioversion had been carried out. There was difficulty carrying out the Bruce protocol and the interpretation was difficult. Asthma precluded carrying out an adenosine provoked myocardial perfusion scan. MUGA scan showed an ejection fraction of 49%. Interpretation of echocardiography was difficult because of marked obesity. Coronary angiography showed good LV function with no mitral regurgitation and mild coronary artery disease (no more than 30% in a single obtuse marginal). The advice of a Panel member had been that the applicant was probably at low cardiac risk and it had been recommended that re-licensing was offered subject to satisfactory enquiry about the sleep apnoea, and then subject to annual review.

The Panel confirmed that this was in accord with the advice agreed earlier in the meeting. However, it noted again the difficulty posed in assessing risk levels for licensing purposes in those cases where there is co-morbidity and no specific debarring level of pathology, despite well-documented high cardiac risk levels for example in patients with high Body Mass Index. It was agreed that this topic should be brought again to the Panel Chairmen's meeting in 2005.

#### Case 4/04/04

This 61 year old Group 2 driver has a history of rheumatoid arthritis and a previous Transient Ischaemic Attack. Exercise ECG could not be completed because of physical difficulty. Thallium scan indicated a blood pool LVEF of 39%. The Panel was advised that the normal range for LVEF using this method of measurement is 40-45. There is an anterior reversible perfusion defect, which is described as very small, and the consultant is supportive that this does not equate to a defect that would give a greater than 2mm ST depression on exercise ECG.

Although there is only 1 small reversible defect, the LVEF requirement is not met. It was therefore advised that the applicant could not meet the standard.

The Panel asked if there is the facility for the applicant to be advised that further information, such as an angiography, may be submitted in the future, and that this information would be scrutinised by a Panel member before a decision was made as to whether to allow reapplication.

#### Case 5/05/04

This 54 year old hypertensive previous Group 2 driver had been suspected of having angina, and the entitlement had been revoked. Mild changes in exercise ECG and angiogram were found. The applicant claimed that all symptoms had gone since cholecystectomy earlier in the year.

The Panel noted that chest tightness had developed during the exercise ECG prior to having the cholecystectomy, and there were some obstructive lesions in angiography. It was recommended that DVLA should invite reapplication and that a repeat exercise test, using the Bruce protocol, should be commissioned on reapplication, and if necessary reviewed by a Panel member.

#### 16. Number Of Cases Referred To Members Of Panel Since Last Meeting

16.1 The Secretary reported that she was aware of 9 cases referred to individual Panel members since the last meeting and provided the analysis.

Angiograms 4  
Congenital 1  
HOCM 1  
Imaging 1  
LVAD 1  
Exercise ECG 1

#### 17. Research Update

17.1 The following topics have been proposed:

Longitudinal study of the prognostic value of Exercise ECG, Dukes score and ABPI (proposed from the Combined Panel)

Looking at the BMI as a risk factor

The level of risk of sudden cardiac event in the 6 months post new implantation of a Defibrillator. Very large number of Group 1 drivers would be needed to produce meaningful results or there could be a retrospective analysis using the DVLA database. It was felt that the information was needed specifically on Drivers.

A literature review on the comparison between the prognostic value of the Exercise test and the perfusion scan

A literature review on the prognostic indication of one, two and three vessel coronary artery disease.

17.2 It was hoped that a literature researcher would be appointed in DVLA some time this year.

17.3 Dr Read advised that she would be interested to know of any clinical research that was being considered that DfT could link to, to obtain maximum benefit without much extra change to the protocol.

17.4 The Panel was advised that a literature review had been commissioned on the value of a single acute cardiac event as a prognostic indicator of a further acute cardiac event. All Panel members will be circulated with the search criteria and invited to comment.

17.5 It had not been possible to organise the 2-day workshop on arrhythmia. It was felt that this topic did not currently have a high priority from the perspective of driver licensing. However, the panel was asked to submit topics that would lend themselves to a 1-day workshop in the future. The following were proposed.

The prognostic indicator of angiographic results and the stratification of these results after the exercise ECG and perfusion scan and the identification of core cardiac assessment centres

Aneurysms

#### 18. Dates of Next Meetings

The date of the next meeting is 24 November 2004. Time and place to be advised.

The date of the subsequent meeting was agreed as 3 March 2005.

#### 19. Any Other Business

There being no other business the meeting closed at 3.10 pm.

Important: These advisory notes represent the balanced judgement of the Secretary of State's Honorary Medical Advisory Panel as a whole. If they are quoted, they should be reproduced as such and not as the views of individual Panel members.