# Cardiovascular Recommendation Tables

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The first publication of the Cardiovascular Recommendation Tables occurred in the October 2002, **Cardiovascular Advisory Panel Guidelines for the Medical Examination of Commercial Motor Vehicle Drivers,** FMCSA-MCP-02-002.
PDF Version - HTML Version

Effort has been made to ensure the accuracy of data conversion when creating these tables. Please Contact NRCME if you identify an issue.

**Important Note: If you print the tables**, you should periodically verify that the print file is current with the last update posted on the NRCME Web site at: http://nrcme.fmcsa.dot.gov/part_4_guide_ep.htm#lastup.

See the Cardiovascular Table Archives for descriptions of the updates. A log of changes made is posted on the NRCME Web site, on the Cardiovascular Table Archives Web page located at http://nrcme.fmcsa.dot.gov/cvs_tables_archive.htm.

# Preface

The Federal Motor Carrier Safety Administration (FMCSA) has an ongoing process for reviewing all Federal medical standards and guidelines used to determine driver medical fitness for duty.

These tables will be updated when changes are made to FMCSA medical standards and guidelines. All proposed changes to the medical standards are subject to public notice-and-comment rulemaking.

As part of its review process, FMCSA considers medical evidence reports, medical expert panel (MEP) opinion, and Medical Review Board (MRB) recommendations. FMCSA also considers other factors such as feasibility and impact.

These tables do not include recommendations that have been submitted to FMCSA for consideration but not adopted by FMCSA. However, FMCSA posts copies of the medical evidence report executive summaries and MEP recommendations on the FMCSA Web page Reports - How Medical Conditions Impact Driving found at http://www.fmcsa.dot.gov/rules-regulations/topics/mep/mep-reports.htm.

Reports of MRB proceedings are posted on the MRB Web site at http://www.mrb.fmcsa.dot.gov/proceedings.htm, and the MRB public meeting schedule at http://www.mrb.fmcsa.dot.gov/meetings_scheduled.htm.

Medical examiners may submit questions or comments to the FMCSA Office of Medical Programs by sending an email to fmcsamedical@dot.gov.

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## ANEURYSMS

2002 Cardiovascular Conference Report Recommendation Tables, Page 145

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Abdominal Aortic Aneurysm (AAA) | Evaluate for associated cardiovascular diseases. | | |
| | Aneurysm <4.0 cm. | Yes, if asymptomatic. | Annual |
| | Aneurysm 4.0 to <5.0 cm.<br><br>Ultrasound to identify change in size. | Yes if:<br>Asymptomatic;<br>Cleared by vascular specialist.<br><br>No, if:<br>Symptomatic;<br>Surgery recommended by vascular specialist. | Annual<br>Ultrasound for change in size. |
| | | Yes if:<br>At least 3 months after surgical repair;<br>Cleared by cardiovascular specialist. | Annual |
| | Aneurysm >5.0 cm. | No.<br><br>Yes if:<br>At least 3 months after surgical repair;<br>Cleared by cardiovascular specialist. | Annual |
| Thoracic Aneurysm | Evaluate for associated cardiovascular diseases. | No, if >3.5 cm.<br><br>Yes if:<br>At least 3 months after surgical repair;<br>Cleared by cardiovascular specialist. | Annual |
| Aneurysms of Other Vessels | Assess for risk of rupture and for associated cardiovascular diseases. | No<br><br>Yes if:<br>At least 3 months after surgical repair;<br>Cleared by cardiovascular specialist. | Annual |

## AORTIC CONGENITAL HEART DISEASE

2002 Cardiovascular Conference Report Recommendation Tables, Page 122

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Bicuspid Aortic Valve | May result in aortic stenosis or regurgitation (see section on Valvular Diseases), aortic root enlargement, aortic aneurysm formation and aortic rupture. | See section on Valvular Diseases.<br><br>No if:<br>Aortic transverse diameter >5.5 cm.<br><br>Yes if:<br>Surgical intervention successfully performed. | See section on Valvular Diseases.<br><br>Annual |
| Subvalvular Aortic Stenosis | Mild = favorable.<br>Has potential for progression.<br><br>Moderate or severe = unfavorable. | Yes if:<br>Aortic;<br>No valvular abnormality or hypertrophic cardiomyopathy.<br><br>No if:<br>Symptomatic and mean pressure gradient >30 mm Hg.<br><br>Yes if:<br>At least 3 months after successful surgical resection when cleared by cardiologist knowledgeable in congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease is required.<br><br>Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease required, including echocardiogram. |
| Discrete Supravalvular Aortic Stenosis | Unfavorable prognosis due to associated coronary and aortic disorder. | No, unless surgery.<br><br>Yes if:<br>At least 3 months post-surgical intervention;<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease is recommended. |

## AORTIC CONGENITAL HEART DISEASE (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 123

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Marfan Syndrome | Cardiovascular disorders are the major cause of morbidity and mortality including risk of sudden death. | Yes if:<br>No cardiovascular involvement.<br><br>No if:<br>Any aortic root enlargement;<br>Moderate or more severe aortic regurgitation;<br>> mild mitral regurgitation related to mitral valve prolapse;<br>LV dysfunction with EF <40% and no associated valve disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease required including aortic root imaging and echocardiography. |

## AORTIC REGURGITATION

2002 Cardiovascular Conference Report Recommendation Tables, Page 79

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Mild Aortic Regurgitation | | Yes, if asymptomatic. | Annual Echocardiogram every 2 to 3 years. |
| Moderate Aortic Regurgitation | | Yes, if:<br>Normal LV function;<br>No or mild LV enlargement. | Annual Echocardiogram every 2 to 3 years. |
| Severe Aortic Regurgitation | | Yes if:<br>Asymptomatic;<br>Normal LV function (EF = 50%);<br>LV dilatation (LVEDD <60mm, LVESD <50mm).<br><br>If LVEDD = 60mm or LVESD = 50mm.<br><br>No if:<br>Symptoms;<br>Unable to complete Bruce protocol Stage II;<br>Reduced EF <50%,<br>LV dilatation LVEDD >70mm or LVESD >55mm.<br><br>Yes if:<br>Valve surgery and at least 3 months post surgery;<br>Asymptomatic;<br>Cleared by cardiologist. | Every 6 months Echocardiogram every 6 to 12 months.<br><br>Every 4–6 months Echocardiogram every 4–6 months if no surgery performed.<br><br>Annual |

EF=Ejection fraction
LVESD=Left ventricular end-systolic dimension
LVEDD=Left ventricular end-diastolic dimension

## AORTIC STENOSIS

2002 Cardiovascular Conference Report Recommendation Tables, Page 78

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Mild Aortic Stenosis (AVA >1.5 $cm^2$) | If symptoms are consistent with aortic stenosis but calculated valve area suggests mild aortic stenosis, the severity of the stenosis and an alternative explanation for symptoms needs to be reassessed. | Yes, if Asymptomatic. | Annual Echocardiogram every 5 years. |
| Moderate Aortic Stenosis (AVA ≥1.0-1.5 $cm^2$) | | Yes, if: Asymptomatic;<br><br>Yes if: At least 3 months after surgery.<br><br>No if: Angina, heart failure, syncope; Atrial fibrillation; LV dysfunction with EF <50%; Thromboembolism. | Annual Echocardiogram every 1 to 2 years.<br><br>Annual |
| Severe Aortic Stenosis (AVA <1.0 $cm^2$) | | No, irrespective of symptoms or LV function.<br><br>Yes, if at least 3 months after surgery. | <br><br>Annual |

AVA = aortic valve area

## ATRIAL SEPTAL DEFECTS

2002 Cardiovascular Conference Report Recommendation Tables, Page 124

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION RECERTIFICATION | |
|---|---|---|---|
| Atrial Septal Defect (ASD): Ostium Secundum | Small ASD = favorable. | Yes if:<br>Asymptomatic. | Annual<br>Evaluation by cardiologist knowledgeable in congenital heart disease including echocardiogram. |
| | Moderate to large ASD = unfavorable. | No if:<br>Symptoms of dyspnea, palpitations or a paradoxical embolus;<br>Pulmonary hypertension;<br>Right-to-left shunt;<br>Pulmonary to systemic flow ratio >1.5 to 1. | |
| | | Yes if:<br>At least 3 months after surgery or at least 4 weeks after device closure;<br>Asymptomatic and clearance by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease every 2 years. |

## ATRIAL SEPTAL DEFECTS (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 125

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| ASD:<br>Ostium<br>Primum | Small ASD = favorable prognosis. | Yes if:<br>Asymptomatic. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease required including echocardiogram. |
| | Moderate to large ASD = unfavorable prognosis. | No if:<br>Symptoms of dyspnea, palpitations or a paradoxical embolus;<br>Echo-Doppler demonstrates pulmonary artery pressure >50% systemic;<br>Echo-Doppler demonstrates right-to-left shunt;<br>Pulmonary to systemic flow ratio greater than 1.5 to 1;<br>Heart block on an electrocardiogram;<br>More than mild mitral valve regurgitation;<br>Left ventricular outflow tract obstruction with a gradient >30 mm Hg. | |
| | | Yes if:<br>At least 3 months after surgical intervention if none of the above disqualifying criteria;<br>No symptomatic arrhythmia and no significant residual shunt;<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease. |

## ATRIAL SEPTAL DEFECTS (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 126

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Sinus Venosus Atrial Septal Defect | Usually associated with anomalous pulmonary venous connection.<br>Prognosis depends on size of atrial septal defect.<br>Commonly associated with sinus node dysfunction, particularly after surgery. | Yes if:<br>Small shunt and hemodynamically insignificant.<br><br>No if:<br>Symptoms of dyspnea, palpitations or a paradoxical embolus;<br>Echo-Doppler examination demonstrating pulmonary artery pressure greater than 50% systemic;<br>Echo-Doppler examination demonstrating a right-to-left shunt;<br>Pulmonary to systemic flow ratio greater than 1.5 to 1;<br>Heart block or sinus node dysfunction on an electrocardiogram.<br><br>Yes if:<br>At least 3 months after surgical intervention;<br>Hemodynamics are favorable;<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease.<br><br>Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease, including Holter Monitor. |

## BUNDLE BRANCH BLOCKS AND HEMIBLOCKS

2002 Cardiovascular Conference Report Recommendation Tables, Page 100

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Bundle Branch Block<br><br>Axis Deviation | Progression of disease in the conduction system can lead to third degree heart block with total loss of electrical connection between the atria and ventricles causing syncope or sudden death. | Yes if:<br>Asymptomatic.<br>(Depends on risk from underlying heart disease.)<br><br>Yes, if treated for symptomatic disease (see pacemaker);<br>No disqualifying heart disease;<br>Cleared by cardiologist.<br><br>No, if symptomatic. | Every 2 years<br><br>Annual |

## CARDIOMYOPATHIES AND CONGESTIVE HEART FAILURE (CHF)

2002 Cardiovascular Conference Report Recommendation Tables, Page 82

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Hypertrophic Cardiomyopathy | | No. | |
| Idiopathic Dilated Cardiomyopathy and Congestive Heart Failure | | No, if symptomatic CHF. | |
| | | No if:<br>Asymptomatic;<br>Ventricular arrhythmias present;<br>LVEF ≤50%. | |
| | | No if:<br>Asymptomatic;<br>No ventricular arrhythmias;<br>LVEF <40%. | |
| | | Yes if:<br>Asymptomatic;<br>No ventricular arrhythmias;<br>LVEF 40% to 50%. | Annual<br>Requires annual cardiology evaluation including Echocardiography and Holter monitoring. |
| Restrictive Cardiomyopathy | | No | |

**Important Note:** This print file was current as of "February 2009." Check for more recent updates at http://nrcme.fmcsa.dot.gov/part_4_guide_ep.htm#lastup.htm.

## COMMERCIAL DRIVERS WITH KNOWN CORONARY HEART DISEASE (CHD)

2002 Cardiovascular Conference Report Recommendation Tables, Page 36

| DIAGNOSIS | PHYSIOLOGIC/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Post Myocardial Infarction (MI) | Risk of recurrent major cardiac event highest within the first months post-MI.<br>Drivers in a rehabilitation program can receive comprehensive secondary prevention therapy. | No if:<br>Recurrent angina symptoms;<br>Post-MI ejection fraction <40% (by echocardiogram or ventriculogram);<br>Abnormal ETT demonstrated prior to planned work return;<br>Ischemic changes on rest ECG;<br>Poor tolerance to current cardiovascular medications.<br><br>Yes if:<br>At least 2 months post-MI;<br>Cleared by cardiologist;<br>No angina;<br>Post-MI ejection fraction ≥40% (by echocardiogram or ventriculogram);<br>Tolerance to current cardiovascular medications. | Annual<br>Biennial ETT at minimum (If test positive or inconclusive, imaging stress test may be indicated).<br>Cardiologist examination recommended. |
| Angina Pectoris | Lower end of spectrum among CHD patients for risk of adverse clinical outcomes.<br>Condition usually implies at least one coronary artery has hemodynamically significant narrowing. | Yes, if asymptomatic.<br><br>No if:<br>Rest angina or change in angina pattern within 3 months of examination;<br>Abnormal ETT;<br>Ischemic changes on rest ECG;<br>Intolerance to cardiovascular therapy. | Annual<br><br>Biennial ETT at minimum (If test positive or inconclusive, imaging stress test may be indicated).<br>Cardiologist examination recommended. |

## COMMERCIAL DRIVERS WITH KNOWN CORONARY HEART DISEASE (CHD) (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 37

| DIAGNOSIS | PHYSIOLOGIC/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Post Percutaneous Coronary Intervention (PCI) | Rapid recovery for elective PCIs for stable angina. Delayed re-stenosis is the major PCI limitation and requires intensive secondary prevention. | Yes if:<br>At least 1 week after procedure;<br>Approval by cardiologist;<br>Tolerance to medications.<br><br>ETT 3 to 6 months after PCI.<br><br>No if:<br>Incomplete healing or complication at vascular access site;<br>Rest angina;<br>Ischemic ECG changes. | Annual<br>Recommend cardiologist examination.<br><br>Biennial ETT at minimum (If test positive or inconclusive, imaging stress test may be indicated). |
| Post Coronary Artery Bypass Surgery (CABG) | Delay in return to work to allow sternal incision healing. Because of increasing risk of graft closure over time, ETT is obtained. | Yes if:<br>At least 3 months after CABG;<br>LVEF ≥40% post CABG;<br>Approval by cardiologist;<br>Asymptomatic;<br>Tolerance to medications. | Annual<br>After 5 years: Annual ETT. Imaging stress test may be indicated. |

## COMMERCIAL DRIVERS WITHOUT KNOWN CORONARY HEART DISEASE (CHD)

2002 Cardiovascular Conference Report Recommendation Tables, Page 35

| DIAGNOSIS | PHYSIOLOGIC/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Asymptomatic, healthy | Low CHD event risk.<br>Assess for clinically apparent risk factors.<br>Use, when possible, Framingham risk score model to predict 10-year CHD event risk.<br>Increasing age is a surrogate marker for increasing atherosclerotic plaque burden. | Yes, if asymptomatic;<br>Rarely disqualifying alone. | Biennial |
| Asymptomatic, high risk person (as designated by CHD risk-equivalent condition)*<br><br>Asymptomatic, high risk person >45 years with multiple risk factors for CHD | Sub-clinical coronary atherosclerosis is a concern.<br>High-risk status requires close physician follow-up and aggressive comprehensive risk factor management. | Yes if: asymptomatic.<br><br>No if:<br>Abnormal ETT;**<br>Ischemic changes on ECG;†<br>Functional incapacitation by one of conditions. | Annual |

*CHD risk equivalent is defined as presence of diabetes mellitus, peripheral vascular disease, or Framingham risk score predicting a 20% CHD event risk over the next 10 years.

** Abnormal Exercise Tolerance Test (ETT) is defined by an inability to exceed 6 METS (beyond completion of Stage II, or 6 minutes) on a standard Bruce protocol or the presence of ischemic symptoms and/or signs (e.g., characteristic angina pain or 1 mm ST depression or elevation in 2 or more leads), inappropriate SBP and/or heart rate responses (e.g., inability in the maximal heart rate to meet or exceed 85% of age-predicted maximal heart rate), or ventricular dysrhythmia.

† Ischemic ECG changes are defined by the presence of new 1 mm ST-segment elevation or depression and/or marked T wave abnormality.

## CONGENITAL HEART DISEASE

2002 Cardiovascular Conference Report Recommendation Tables, Page 128

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Patent Ductus Arteriosus (PDA) | Small = favorable.<br><br>Moderate to large = unfavorable | Yes, if small shunt.<br><br>No if:<br>Symptoms of dyspnea or palpitations;<br>Pulmonary hypertension;<br>Right to left shunt;<br>Progressive LV enlargement or decreased systolic function.<br><br>Yes if:<br>At least 3 months after surgery or 1 month after device closure;<br>None of above disqualifying criteria;<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br><br>Annual<br>Should have evaluation by cardiologist knowledgeable in adult congenital heart disease. |
| Coarctation of the Aorta | Mild = favorable.<br><br>Moderate or severe = unfavorable prognosis. | Yes if:<br>Mild and unoperated;<br>BP controlled;<br>No associated disqualifying disease.<br><br>No | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease recommended. |
| Coarctation of the Aorta after intervention | Unfavorable prognosis with persistent risk of cardiovascular events. | Yes, if<br>perfect repair (see text p. 115 and 116). | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease required. |

## CONGENITAL HEART DISEASE (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 129

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Pulmonary Valve Stenosis (PS) | Mild and moderate = favorable.<br><br>Severe PS may be unfavorable, associated with arrhythmias and rarely sudden death. | Yes, if mild or moderate.<br><br>No if:<br>Symptoms of dyspnea, palpitations or syncope;<br>Pulmonary valve peak gradient >50 mm Hg with normal output;<br>RV pressure >50% systemic pressure;<br>>mild RVH;<br>>mild RV dysfunction;<br>>moderate pulmonary valve regurgitation;<br>Main pulmonary artery >5 cm.<br><br>Yes if:<br>3 months after surgical valvotomy or 1 month after balloon valvuloplasty;<br>None of above disqualifying criteria;<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease.<br><br>Annual<br>Recommend evaluation by cardiologist knowledgeable in adult congenital heart disease. |
| Other causes of right ventricular outflow obstruction in persons with congenital heart disease | Double chambered right ventricle.<br>Infundibular pulmonary stenosis.<br>Supravalvar pulmonary stenosis.<br>Pulmonary artery stenosis. | Yes if:<br>Hemodynamic data and criteria similar to individuals with isolated pulmonary valve stenosis who are eligible for certification. | Annual<br>Recommend evaluation by cardiologist knowledgeable in adult congenital heart disease. |

## CONGENITAL HEART DISEASE (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 130

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RE-CERTIFICATION |
|---|---|---|---|
| Ebstein Anomaly | Mild = favorable.<br><br>Moderate and severe variants = unfavorable. | Yes if:<br>Mild;<br>Asymptomatic;<br>No intracardiac lesions;<br>No shunt;<br>No symptomatic arrhythmia or accessory conduction;<br>Only mild cardiac enlargement;<br>Only mild RV dysfunction.<br><br>No if:<br>(see text, p. 117).<br><br>Yes if:<br>At least 3 months post-surgical intervention;<br>None of above disqualifying features. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease.<br><br>Annual<br>Echocardiogram and evaluation by cardiologist knowledgeable in adult congenital heart disease required. |
| Tetralogy of Fallot | Unfavorable in the unrepaired state.<br><br>Repaired = variable prognosis. | No, if uncorrected.<br><br>Yes if:<br>Excellent result obtained from surgery;<br>Asymptomatic;<br>No significant pulmonary or tricuspid valve regurgitation;<br>No pulmonary stenosis;<br>No history of arrhythmias;<br>No residual shunt. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease required, including EKG, 24-hour Holter Monitor, exercise testing, Doppler Echocardiogram. |

## CONGENITAL HEART DISEASE (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 131

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Transposition of the Great Vessels | Unfavorable if uncorrectable. | No | |
| | Atrial switch repair (Mustard or Senning procedures). Unfavorable long-term prognosis. | No | |
| | After Rastelli repair. | Yes if: Asymptomatic and excellent result obtained from surgery<br><br>No if: (see text p.119). | Annual Evaluation by cardiologist knowledgeable in adult congenital heart disease. |
| | After arterial switch repair, prognosis appears favorable. | No (Data currently not sufficient to support qualification in this group). | |

## CONGENITAL HEART DISEASE (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 132

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Congenitally Corrected Transposition | 95% have associated intracardiac lesions. Conduction system is inherently abnormal. | Yes if:<br>None of below disqualifying criteria.<br><br>No if:<br>Symptoms of dyspnea, palpitations, syncope or paradoxical embolus;<br>Intracardiac lesion such as VSD;<br>>moderate pulmonary stenosis with a pulmonary ventricular pressure >50% systemic;<br>>mild RV or LV enlargement or dysfunction;<br>Moderate or greater tricuspid valve (systemic atrioventricular valve) regurgitation;<br>History of atrial or ventricular arrhythmia;<br>ECG with heart block;<br>Right-to-left shunt or significant residual left-to-right shunt.<br><br>Yes if:<br>At least 3 months after surgery;<br>None of above disqualifying criteria;<br>Prosthetic valve–must meet requirements for that valve;<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Required annual evaluation by cardiologist knowledgeable in adult congenital heart disease includes echocardiography and 24-hour Holter Monitor.<br><br>Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease. |

## HEART TRANSPLANTATION

2002 Cardiovascular Conference Report Recommendation Tables, Page 154

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Heart Transplantation | Special attention to: Accelerated atherosclerosis, transplant rejection, general health. | Yes if:<br>At least 1 year post-transplant;<br>Asymptomatic;<br>Stable on medications;<br>No rejection;<br>Consent from cardiologist to drive commercially. | Biannual<br>Clearance by cardiologist required. |

**Important Note:** This print file was current as of "February 2009." Check for more recent updates at http://nrcme.fmcsa.dot.gov/part_4_guide_ep.htm#lastup.htm.

## HYPERTENSION

2002 Cardiovascular Conference Report Recommendation Tables, Page 55

| DIAGNOSIS | PHYSIOLOGIC/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Essential Hypertension | Evaluate for other clinical CVD including TOD.†<br>Presence of TOD, CVD or diabetes may affect therapy selected. | Yes, if asymptomatic.<br>Rarely disqualifying alone. | Biennial |
| Stage 1 (140-159/90-99 mm Hg) | Usually asymptomatic.<br>Low risk for near-term incapacitating event. | Yes<br>Rarely disqualifying alone. | Annual<br>BP <140/90 at annual exam.<br>If not, but <160/100, certification extended one time for 3 months. |
| Stage 2 (160–179/100–109 mm Hg) | Low risk for incapacitating event.<br>Risk increased in presence of TOD.<br>Indication for pharmacologic therapy. | Yes<br>One time certification for 3 months.<br><br>Yes, at recheck if:<br>BP ≤140/90 mm Hg;<br>Certify for 1 year from date of initial exam. | <br><br><br>Annual<br>BP ≤140/90. |
| Stage 3 (≥180/110 mm Hg) | High risk for acute hypertension-related event. | No<br>Immediately disqualifying.<br><br>Yes, at recheck if:<br>BP ≤140/90 mm Hg;<br>Treatment is well tolerated;<br>Certify for 6 months from date of initial exam. | <br><br><br>Every 6 months<br>BP ≤140/90. |
| Secondary Hypertension | Evaluation warranted if persistently hypertensive on maximal or near-maximal doses of 2-3 pharmacologic agents.<br>May be amenable to surgical/specific therapy. | Based on above stages.<br><br>Yes if:<br>Stage 1 or nonhypertensive;<br>At least 3 months after surgical correction. | <br><br>Annual<br>BP ≤140/90. |

† TOD – Target Organ Damage – Heart Failure, Stroke or Transient Ischemic Attack, Peripheral Artery Disease, Retinopathy, Left Ventricular Hypertrophy, Nephropathy. Examiner may disqualify a driver if TOD significantly impairs driver's work capacity. Driver should have no excess sedation or orthostatic change in BP.

## IMPLANTABLE DEFIBRILLATORS

2002 Cardiovascular Conference Report Recommendation Tables, Page 104

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Primary Prevention | Patient has high risk for death and sudden incapacitation. | No | |
| Secondary Prevention | Patient demonstrated to have high risk for death and sudden incapacitation. | No | |

## MITRAL REGURGITATION

2002 Cardiovascular Conference Report Recommendation Tables, Page 77

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Mild Mitral Regurgitation | | Yes, if:<br>Asymptomatic;<br>Normal LV size and function;*<br>Normal PAP. | Annual<br>Annual echo not necessary. |
| Moderate Mitral Regurgitation | | Yes, if:<br>Asymptomatic;<br>Normal LV size and function;*<br>Normal PAP. | Annual<br>Annual Echocardiogram. |
| Severe Mitral Regurgitation | | Yes, if asymptomatic.<br><br>Yes if:<br>At least 3 months post-surgery;<br>Asymptomatic;<br>Cleared by cardiologist.<br><br>No if:<br>Symptomatic;<br>Inability to achieve >6 METS on Bruce protocol;<br>Ruptured chordae or flail leaflet;<br>Atrial fibrillation;<br>LV dysfunction;*<br>Thromboembolism;<br>Pulmonary artery pressure >50% of systolic arterial pressure. | Annual<br>Echocardiogram every 6-12 months.<br>Exercise testing may be helpful to assess symptoms.<br><br>Annual |

EF = Ejection fraction; LVESD = Left ventricular end-systolic dimension
LVEDD = Left ventricular end-diastolic dimension;
PAP = Pulmonary artery pressure
*Measures include: LVEF <60%; LVESD ≥45mm; LVEDD ≥70mm

## MITRAL STENOSIS

2002 Cardiovascular Conference Report Recommendation Tables, Page 76

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| *Mild Mitral Stenosis<br>MVA ≥1.6 $cm^2$ | In the presence of symptoms consistent with moderate to severe mitral stenosis but a calculated valve area suggesting mild mitral stenosis, the severity of the stenosis should be reassessed and an alternative explanation for symptoms should be considered. | Yes, if asymptomatic. | Annual |
| *Moderate Mitral Stenosis<br>MVA 1.0 to 1.6 $cm^2$ | | Yes, if asymptomatic. | Annual |
| *Severe Mitral Stenosis<br>MVA ≤1.0 $cm^2$ | | No if:<br>NYHA Class II or higher;<br>Atrial fibrillation;<br>Pulmonary artery pressure >50% of systemic pressure;<br>Inability to exercise for >6 Mets on Bruce protocol (Stage II).<br><br>Yes if:<br>At least 4 weeks post percutaneous balloon mitral valvotomy;<br>At least 3 months post surgical commissurotomy;<br>Clearance by cardiologist. | <br><br><br><br><br><br><br><br>Annual<br>Annual evaluation by a cardiologist. |

MVA = mitral valve area

*See text p.61 for additional echocardiogram criteria.

## PACEMAKERS

2002 Cardiovascular Conference Report Recommendation Tables, Page 101

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION RE | CERTIFICATION |
|---|---|---|---|
| Sinus Node Dysfunction | Va riable long-term prognosis depending on underlying disease, but cerebral hypoperfusion corrected by support of heart rate by pacemaker. | No<br><br>Yes if:<br>1 month after pacemaker implantation;<br>Documented correct function by pacemaker center;<br>Underlying disease is not disqualifying. | <br><br>Annual<br>Documented pacemaker checks. |
| Atrioventricular (AV) Block | Variable long-term prognosis depending on underlying disease, but cerebral hypoperfusion corrected by support of heart rate by pacemaker. | No<br><br>Yes if:<br>1 month after pacemaker implantation and documented correct function by pacemaker center;<br>Underlying disease is not disqualifying. | <br><br>Annual<br>Documented pacemaker checks. |

**PACEMAKERS (Continued)**

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION RE | CERTIFICATION |
|---|---|---|---|
| Neurocardiogenic Syncope | Excellent long-term survival prognosis, but there is risk for syncope that may be due to cardioinhibitory (slowing heart rate) or vasodepressor (drop in blood pressure) components, or both. Pacemaker will affect only cardioinhibitory component, but will lessen effect of vasodepressor component. | No, with symptoms.<br><br>Yes if:<br>3 months* after pacemaker implantation;<br>Documented correct function by pacemaker center;<br>Absence of symptom recurrence. | <br><br>Annual<br>Documented pacemaker checks.<br>Absence of symptom recurrence. |

*Three months recommended due to possible vasodepressor component of syndrome not necessarily treated by pacing.

## PACEMAKERS (Continued)

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Hypersensitive Carotid Sinus with Syncope | Excellent long-term survival prognosis, but there is risk for syncope that may be due to cardioinhibitory (slowing heart rate) or vasodepressor (drop in blood pressure) components, or both. Pacemaker will affect only cardioinhibitory component, but will lessen effect of vasodepressor component. | No, with symptoms.<br><br>Yes if:<br>3 months* after pacemaker implantation;<br>Documented correct function by pacemaker center;<br>Absence of symptom recurrence. | Annual<br>Documented regular pacemaker checks.<br>Absence of symptom recurrence. |

*Three months recommended due to possible vasodepressor component of syndrome not necessarily treated by pacing.

## PERIPHERAL VASCULAR DISEASE

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Peripheral Vascular Disease (PVD) | Evaluate for associated cardiovascular diseases. | Yes, if no other disqualifying cardiovascular condition. | Annual |
| Intermittent Claudication | Most common presenting manifestation of occlusive arterial disease.<br><br>Rest pain. | Yes if:<br>At least 3 months after surgery;<br>Relief of symptoms;<br>No other disqualifying cardiovascular disease.<br><br>No, if symptoms.<br><br>Yes if:<br>At least 3 months after surgery;<br>Relief of symptoms and signs;<br>No other disqualifying cardiovascular disease. | Annual<br><br>Annual |

## SUPRAVENTRICULAR TACHYCARDIAS

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Atrial Fibrillation | | | |
| Lone Atrial Fibrillation | Good prognosis and low risk for stroke. | Yes | Annual |
| Atrial fibrillation as cause of or a risk for stroke | Risk for stroke decreased by anticoagulation. | Yes if:<br>Anticoagulated adequately for at least 1 month;<br>Anticoagulation monitored by at least monthly INR;<br>Rate/rhythm control deemed adequate<br>(Recommend assessment by cardiologist). | Annual |
| Atrial fibrillation following thoracic surgery | Good prognosis and duration usually limited. | In atrial fibrillation at time of return to work;<br>Yes if:<br>Anticoagulated adequately for at least 1 month;<br>Anticoagulation monitored by at least monthly INR;<br>Rate/rhythm control deemed adequate<br>(Recommend assessment by cardiologist). | Annual |

## SUPRAVENTRICULAR TACHYCARDIAS (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 97

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Atrial Flutter | Same as for atrial fibrillation. | Same as for atrial fibrillation.<br><br>Yes if:<br>Isthmus ablation performed and at least 1 month after procedure;<br>Arrhythmia successfully treated;<br>Cleared by electrophysiologist. | Same as for atrial fibrillation.<br><br>Annual |
| Multifocal Atrial Tachycardia | Often associated with comorbidities, such as lung disease, that may impair prognosis. | Yes if:<br>Asymptomatic;<br>Unless associated condition is disqualifying.<br><br>No, if symptomatic.<br><br>Yes if:<br>Symptoms controlled and secondary cause is not exclusionary. | Annual<br><br>Annual |
| Atrioventricular Nodal Reentrant Tachycardia (AVNRT)<br><br>Atrioventricular Reentrant Tachycardia (AVRT) and Wolff-Parkinson-White (WPW) Syndrome<br><br>Atrial Tachycardia<br><br>Junctional Tachycardia | Prognosis generally excellent, but may rarely have syncope or symptoms of cerebral hypoperfusion.<br>For those with WPW, pre-excitation presents risk for death or syncope if atrial fibrillation develops. | No if:<br>Symptomatic;<br>WPW with atrial fibrillation.<br><br>Yes if:<br>Asymptomatic;<br>Treated and asymptomatic for at least 1 month and assessed and cleared by expert in cardiac arrhythmias. | Annual<br>Recommend consultation with cardiologist. |

## VALVE REPLACEMENT

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION RECERTIFICATION | |
|---|---|---|---|
| Mechanical Valves | | Yes if:<br>At least 3 months post-op;<br>Asymptomatic;<br>Cleared by cardiologist.<br><br>No if:<br>Symptomatic;<br>LV dysfunction-EF <40%;<br>Thromboembolic complication post procedure;<br>Pulmonary hypertension;<br>Unable to maintain adequate anticoagulation (based on monthly INR checks). | Annual Recommend evaluation by cardiologist.* |
| Pr | osthetic valve dysfunction. | No<br><br>Yes if:<br>Surgically corrected;<br>At least 3 months post-op;<br>Asymptomatic;<br>Cleared by cardiologist. | Annual Recommend evaluation by cardiologist.* |

* Role of annual echocardiography in stable patients is controversial.

## VALVE REPLACEMENT (Continued)

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| | Atrial fibrillation. | Yes if:<br>Anticoagulated adequately for at least 1 month and monitored by at least monthly INR, rate/rhythm control adequate;<br>Cleared by cardiologist. | Annual |
| Biologic Prostheses | Anticoagulant therapy not necessary in patients in sinus rhythm (after initial 3 months), in absence of prior emboli or hypercoagulable state. | Yes if:<br>At least 3 months post-op;<br>Asymptomatic;<br>None of above disqualifying criteria for mechanical valves;<br>Cleared by cardiologist. | Annual<br>Recommend evaluation by cardiologist.* |

* Role of annual echocardiography in stable patients is controversial.

## VENOUS DISEASE

2002 Cardiovascular Conference Report Recommendation Tables, Page 147

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Acute Deep Vein Thrombosis (DVT) | | No, if symptoms.<br><br>Yes if:<br>No residual acute deep venous thrombosis;<br>If on Coumadin:<br>Regulated for at least 1 month;<br>INR monitored at least monthly. | Annual |
| Superficial Phlebitis | | Yes if:<br>DVT ruled out;<br>No other disqualifying cardiovascular disease. | Biennial |
| Pulmonary Embolus | | No, if symptoms.<br><br>Yes if:<br>No pulmonary embolism for at least 3 months;<br>On appropriate long-term treatment;<br>If on Coumadin:<br>Regulated for at least 1 month;<br>INR monitored at least monthly;<br>No other disqualifying cardiovascular disease. | Annual |
| Chronic Thrombotic Venous Disease | | Yes, if no symptoms. | Biennial |
| Varicose veins | | Yes, if no complications. | Biennial |
| Coumadin | Use of INR required. | Yes if:<br>Stabilized for 1 month;<br>INR monitored at least monthly. | Annual |

## VENTRICULAR ARRHYTHMIAS

2002 Cardiovascular Conference Report Recommendation Tables, Page 98

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Coronary Heart Disease (CHD) | Sustained VT: Poor prognosis and high risk. | No | |
| | NSVT, LVEF <0.40: Unfavorable prognosis. | No | |
| | NSVT, LVEF ≥0.40: Generally considered to have good prognosis. | No, if symptomatic. | |
| | | Yes if: Asymptomatic; At least 1 month after drug or other therapy is successful; Cleared by cardiologist. | Annual Cardiology examination required. |
| Dilated Cardiomyopathy | NSVT (LVEF ≤0.40). | No | |
| | Sustained VT, any LVEF. | No | |
| | Syncope/near syncope, any LVEF: High risk. | No | |
| Hypertrophic Cardiomyopathy | Variable but uncertain prognosis. | | |

## VENTRICULAR ARRHYTHMIAS (Continued)

2002 Cardiovascular Conference Report Recommendation Tables, Page 99

| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Right Ventricular Outflow VT | Favorable prognosis and low risk for syncope. | No, if symptomatic.<br><br>Yes, if asymptomatic.<br><br>Yes if:<br>At least 1 month after drug or other therapy successful;<br>Asymptomatic;<br>Cleared by electrophysiologist. | <br><br>Annual<br>Recommend evaluation by cardiologist.<br><br>Annual<br>Evaluation by cardiologist required. |
| Idiopathic Left Ventricular VT | Favorable prognosis and low risk for syncope. | No, if symptomatic<br><br>Yes, if asymptomatic.<br><br>Yes if:<br>At least 1 month after successful drug therapy or ablation;<br>Cleared by electrophysiologist. | <br><br>Annual<br>Recommend evaluation by cardiologist.<br><br>Annual<br>Evaluation by cardiologist required. |
| Long QT Interval Syndrome | High risk for ventricular arrhythmic death. | No | |
| Brugada Syndrome | High risk for ventricular arrhythmic death. | No | |

EF = ejection fraction
LV = left ventricular
NSVT = nonsustained ventricular tachycardia
VT = ventricular tachycardia

## VENTRICULAR SEPTAL DEFECTS

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| DIAGNOSIS | PHYSIOLOGY/ FUNCTIONAL | CERTIFICATION | RECERTIFICATION |
|---|---|---|---|
| Ventricular Septal Defect | Small = favorable. | Yes, if small shunt. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease recommended. |
| | Moderate to large VSD has effect on pulmonary pressure and ventricular size and function. | No if:<br>Moderate to large VSD;<br>Symptoms of dyspnea, palpitations or syncope;<br>Pulmonary artery hypertension;<br>Right-to-left shunt, left ventricular enlargement or reduced function;<br>Pulmonary to systemic flow ratio greater than 1.5 to 1. | |
| | | Yes if:<br>At least 3 months after surgery;<br>None of above disqualifying criteria;<br>No serious dysrhythmia on 24-hour Holter Monitoring;<br>QRS interval <120 ms<br>(If right ventricle conduction delay >120 ms on ECG, can be certified if invasive HIS bundle studies show no infra-His block or other serious electrophysiologic disorder);<br>Cleared by cardiologist knowledgeable in adult congenital heart disease. | Annual<br>Evaluation by cardiologist knowledgeable in adult congenital heart disease, including 24-hour Holter Monitoring. |