**Table S2.** ICD-9-CM Diagnosis and Procedure Codes CPT Outpatient Procedure codes used to identify ‘high-risk’ cardiac conditions

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| **Cardiac Condition** | **ICD-9-CM Codes (and CPT outpatient procedure codes)** |
| Previous IE | **ICD-9 Diagnostic Code:**  4210 acute and subacute bacterial endocarditis  4211 acute and subacute infective endocarditis (in diseases classified elsewhere)  4219 acute endocarditis, unspecified |
| Prosthetic cardiac valve | **ICD-9 Procedure Codes:**  3505 endovascular replacement of aortic valve  3506 transapical replacement of aortic valve  3507 endovascular replacement of pulmonary valve  3508 transapical replacement of pulmonary valve  3509 endovascular replacement of unspecified heart valve  3520 open and other replacement of unspecified heart valve  3521 open and other replacement of aortic valve with tissue graft  3522 open and other replacement of aortic valve  3523 open and other replacement of mitral valve with tissue graft  3524 open and other replacement of mitral valve  3525 open and other replacement of pulmonary valve with tissue graft  3526 open and other replacement of pulmonary valve  3527 open and other replacement of tricuspid valve with tissue graft  3528 open and other replacement of tricuspid valve  3583 total repair of truncus arteriosus  **CPT Procedure Codes:**  0256T Implantation of catheter-delivered prosthetic aortic heart valve; endovascular approach  0257T Implantation of catheter-delivered prosthetic aortic heart valve; open thoracic approach (eg, transapical, transventricular)  0258T Transthoracic cardiac exposure (eg, sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; without cardiopulmonary bypass  0268T Implantation of catheter-delivered prosthetic pulmonary valve, endovascular approach  0318T Implantation of catheter-delivered prosthetic aortic heart valve, open thoracic approach, (eg, transapical, other than transaortic)  33361 Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; percutaneous femoral artery approach  33362 Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open femoral artery approach  33363 Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open axillary artery approach  33364 Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open iliac artery approach  33365 Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; transaortic approach (eg, median sternotomy, mediastinotomy)  33366 Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; transapical exposure (eg, left thoracotomy)  33405 Replacement, aortic valve, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve  33406 Replacement, aortic valve, with cardiopulmonary bypass; with allograft valve (freehand)  33410 Replacement, aortic valve, with cardiopulmonary bypass; with stentless tissue valve  33411 Replacement, aortic valve; with aortic annulus enlargement, noncoronary sinus  33412 Replacement, aortic valve; with transventricular aortic annulus enlargement (Konno procedure)  33413 Replacement, aortic valve; by translocation of autologous pulmonary valve with allograft replacement of pulmonary valve (Ross procedure)  33430 Replacement, mitral valve, with cardiopulmonary bypass  33465 Replacement, tricuspid valve, with cardiopulmonary bypass  33475 Replacement, pulmonary valve  33477 Transcatheter pulmonary valve implantation, percutaneous approach, including pre-stenting of the valve delivery site, when performed  33496 Repair of non-structural prosthetic valve dysfunction with cardiopulmonary bypass (separate procedure)  **ICD-9 Diagnostic Codes:**  99602 mechanical complication due to heart valve prosthesis  99671 other complications due to heart valve prosthesis  V433 heart valve replaced by other means |
| Prosthetic material used for valve repair | **ICD-9 Procedure Codes:**  3533 annuloplasty  3597 percutaneous mitral valve repair with implant  **CPT Procedure Codes:**  0343T Transcatheter mitral valve repair percutaneous approach including transseptal puncture when performed; initial prosthesis  0344T Transcatheter mitral valve repair percutaneous approach including transseptal puncture when performed; additional prosthesis (es) during same session (List separately in addition to code for primary procedure)  33391 Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; complex (eg, leaflet extension, leaflet resection, leaflet reconstruction, or annuloplasty)  33418 Transcatheter mitral valve repair, percutaneous approach, including transseptal puncture when performed; initial prosthesis  33419 Transcatheter mitral valve repair, percutaneous approach, including transseptal puncture when performed; additional prosthesis(es) during same session (List separately in addition to code for primary procedure)  33426 Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring  33427 Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring  33464 Valvuloplasty, tricuspid valve; with ring insertion  33468 Tricuspid valve repositioning and plication for Ebstein anomaly  33478 Outflow tract augmentation (gusset), with or without commissurotomy or infundibular resection  33600 Closure of atrioventricular valve (mitral or tricuspid) by suture or patch  33602 Closure of semilunar valve (aortic or pulmonary) by suture or patch  33612 Repair of double outlet right ventricle with intraventricular tunnel repair; with repair of right ventricular outflow tract obstruction  33860 Ascending aorta graft, with cardiopulmonary bypass, includes valve suspension, when performed  33861 Ascending aorta graft, with cardiopulmonary bypass, with or without valve suspension; with coronary reconstruction  33863 Ascending aorta graft, with cardiopulmonary bypass, with aortic root replacement using valved conduit and coronary reconstruction (eg, Bentall)  33864 Ascending aorta graft, with cardiopulmonary bypass with valve suspension, with coronary reconstruction and valve-sparing aortic root remodeling (eg, David Procedure, Yacoub Procedure) |
| Unrepaired cyanotic congenital heart disease (CHD) | **ICD-9 Diagnostic Codes:**  7450 common truncus  74510 complete transposition of great vessels  74511 double outlet right ventricle  74519 other transposition of great vessels  7452 tetralogy of Fallot  7453 common ventricle  74560 endocardial cushion defects  7457 cor biloculare  74741 total anomalous pulmonary venous connection |
| CHC in whom a palliative shunt or conduit has been used | **ICD-9 Procedure Codes:**  3541 enlargement of existing arterial septal defect  3542 creation of septal defect in heart  3591 interatrial transposition of venous return  3592 creation of conduit between right ventricle and pulmonary artery  3593 creation of conduit between left ventricle and aorta  3594 creation of conduit between atrium and pulmonary artery  390 systemic to pulmonary shunt  3921 caval-pulmonary artery anastomosis  **CPT Procedure Codes:**  33404 Construction of apical-aortic conduit  33606 Anastomosis of pulmonary artery to aorta (Damus-Kaye-Stansel procedure)  33608 Repair of complex cardiac anomaly other than pulmonary atresia with ventricular septal defect by construction or replacement of conduit from right or left ventricle to pulmonary artery  33610 Repair of complex cardiac anomalies (eg, single ventricle with subaortic obstruction) by surgical enlargement of ventricular septal defect  33611 Repair of double outlet right ventricle with intraventricular tunnel repair;  33612 Repair of double outlet right ventricle with intraventricular tunnel repair; with repair of right ventricular outflow tract obstruction  33615 Repair of complex cardiac anomalies (eg, tricuspid atresia) by closure of atrial septal defect and anastomosis of atria or vena cava to pulmonary artery (simple Fontan procedure)  33617 Repair of complex cardiac anomalies (eg, single ventricle) by modified Fontan procedure  33619 Repair of single ventricle with aortic outflow obstruction and aortic arch hypoplasia (hypoplastic left heart syndrome) (eg, Norwood procedure)  33697 Complete repair tetralogy of Fallot with pulmonary atresia including construction of conduit from right ventricle to pulmonary artery and closure of ventricular septal defect  33735 Atrial septectomy or septostomy; closed heart (Blalock-Hanlon type operation)  33736 Atrial septectomy or septostomy; open heart with cardiopulmonary bypass  33737 Atrial septectomy or septostomy; open heart, with inflow occlusion  33750 Shunt; subclavian to pulmonary artery (Blalock-Taussig type operation)  33755 Shunt; ascending aorta to pulmonary artery (Waterston type operation)  33762 Shunt; descending aorta to pulmonary artery (Potts-Smith type operation)  33764 Shunt; central, with prosthetic graft  33766 Shunt; superior vena cava to pulmonary artery for flow to 1 lung (classical Glenn procedure)  33767 Shunt; superior vena cava to pulmonary artery for flow to both lungs (bidirectional Glenn procedure)  33768 Anastomosis, cavopulmonary, second superior vena cava (List separately in addition to primary procedure)  33774 Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass;  33775 Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass; with removal of pulmonary band  33776 Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass; with closure of ventricular septal defect  33777 Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass; with repair of subpulmonic obstruction  33782 Aortic root translocation with ventricular septal defect and pulmonary stenosis repair (ie, Nikaidoh procedure); without coronary ostium reimplantation  33783 Aortic root translocation with ventricular septal defect and pulmonary stenosis repair (ie, Nikaidoh procedure); with reimplantation of 1 or both coronary ostia  33786 Total repair, truncus arteriosus (Rastelli type operation)  33918 Repair of pulmonary atresia with ventricular septal defect, by unifocalization of pulmonary arteries; without cardiopulmonary bypass  33920 Repair of pulmonary atresia with ventricular septal defect, by construction or replacement of conduit from right or left ventricle to pulmonary artery  92992 Atrial septectomy or septostomy; transvenous method, balloon (eg, Rashkind type) (includes cardiac catheterization)  92993 Atrial septectomy or septostomy; blade method (Park septostomy) (includes cardiac catheterization) |
| Completely repaired CHD defect with prosthetic material or device, whether placed by surgery or catheter intervention, **during first 6 months after the procedure only.** | **ICD-9 Procedure Codes:**  3550 repair of unspecified septal defect of heart with prosthesis  3551 repair of atrial septal defect with prosthesis, open technique  3552 repair of atrial septal defect with prosthesis, closed technique  3553 repair of ventricular septal defect with prosthesis, open technique  3554 repair of endocardial cushion defect with prosthesis  3555 repair of ventricular septal defect with prosthesis, closed technique  3560 repair of unspecified septal defect of heart with tissue graft  3561 repair of atrial septal defect with tissue graft  3562 repair of ventricular septal defect with tissue graft  3563 repair of endocardial cushion defect with tissue graft  3570 other and unspecified repair of unspecified septal defect of heart  3571 other and unspecified repair of atria septal defect  3572 other and unspecified repair of ventricular septal defect  3573 other and unspecified repair of endocardial cushion defect  3581 total repair of tetralogy of Fallot  3582 total repair of total anomalous pulmonary venous connection  3584 total correction of transposition of great vessels  3598 other operations on septa of heart  **CPT Procedure Codes**  0166T Transmyocardial transcatheter closure of ventricular septal defect, with implant; without cardiopulmonary bypass  0167T Transmyocardial transcatheter closure of ventricular septal defect, with implant; with cardiopulmonary bypass  33545 Repair of postinfarction ventricular septal defect, with or without myocardial resection  33641 Repair atrial septal defect, secundum, with cardiopulmonary bypass, with or without patch  33645 Direct or patch closure, sinus venosus, with or without anomalous pulmonary venous drainage  33647 Repair of atrial septal defect and ventricular septal defect, with direct or patch closure  33660 Repair of incomplete or partial atrioventricular canal (ostium primum atrial septal defect), with or without atrioventricular valve repair  33665 Repair of intermediate or transitional atrioventricular canal, with or without atrioventricular valve repair  33670 Repair of complete atrioventricular canal, with or without prosthetic valve  33675 Closure of multiple ventricular septal defects;  33676 Closure of multiple ventricular septal defects; with pulmonary valvotomy or infundibular resection (acyanotic)  33677 Closure of multiple ventricular septal defects; with removal of pulmonary artery band, with or without gusset  33681 Closure of single ventricular septal defect, with or without patch;  33684 Closure of single ventricular septal defect, with or without patch; with pulmonary valvotomy or infundibular resection (acyanotic)  33688 Closure of single ventricular septal defect, with or without patch; with removal of pulmonary artery band, with or without gusset  33692 Complete repair tetralogy of Fallot without pulmonary atresia;  33694 Complete repair tetralogy of Fallot without pulmonary atresia; with transannular patch  33710 Repair sinus of Valsalva fistula, with cardiopulmonary bypass; with repair of ventricular septal defect  33770 Repair of transposition of the great arteries with ventricular septal defect and subpulmonary stenosis; without surgical enlargement of ventricular septal defect  33771 Repair of transposition of the great arteries with ventricular septal defect and subpulmonary stenosis; with surgical enlargement of ventricular septal defect  33778 Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type);  33779 Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type); with removal of pulmonary band  33780 Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type); with closure of ventricular septal defect  33781 Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type); with repair of subpulmonic obstruction  93580 Percutaneous transcatheter closure of congenital interatrial communication (ie, Fontan fenestration, atrial septal defect) with implant  93581 Percutaneous transcatheter closure of a congenital ventricular septal defect with implant |

Notes:

1. Patients at “high-risk” of developing IE were identified by determining whether they had been diagnosed with a “high-risk” condition (ICD-9 codes) or undergone a “high-risk” procedure (ICD-9 or CPT procedure codes) at any time before they first developed IE or at any-time for those who did not develop IE during the study period (within the available healthcare records for that individual).
2. Since the AHA guidelines consider patients with congenital heart disease repaired with prosthetic material to be high-risk only for the first 6 months after the procedure, they were treated as high-risk for the first 6 months after the procedure only.