دائـــــرة الـصـــحـــة
DEPARTMENT OF HEALTH

JAWDA KPI Quarterly Guidelines for pediatric and congenital cardiac Surgery Service Providers

Issue August 2022

Table of Contents

Executive Summary

The Department of Health– Abu Dhabi (DOH) is the regulatory body of the healthcare sector in the Emirate of Abu Dhabi and ensures excellence in healthcare for the community by monitoring the health status of its population.

The Emirate of Abu Dhabi is experiencing a substantial growth in the number of hospitals, centers and clinics. This is ranging from school clinics and mobile units to internationally renowned specialist and tertiary academic centers. Although, access and quality of care has improved dramatically over the last couple of decades, mirroring the economic upturn and population boom of Emirate of Abu Dhabi, however challenges remain in addressing further improvements.

The main challenges that are presented with increasingly dynamic population include an aging population with increased expectation for treatment, utilization of technology and diverse workforce leading to increased complexity of healthcare provision in Abu Dhabi. All of this results in an increased and inherent risk to quality and patient safety.

DOH has developed dynamic and comprehensive quality framework in order to bring about improvements across the health sector. This guidance relates to the quality indicators that DOH is mandating the quarterly reporting against by the operating general and specialist hospitals in Abu Dhabi.

The guidance sets out the full definition and method of calculation for patient safety and clinical effectiveness indicators. For enquiries about this guidance, please contact jawda@DoH.gov.ae

This document is subject for review and therefore it is advisable to utilize online versions available on the DOH at all times.

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About this Guidance

The guidance sets out the definitions and reporting frequency of JAWDA Cardiac Surgery (CS) performance indicators. The Department of Health (DoH), with consultation from local and international expertise of cardiac surgeons, has developed Cardiac Surgery Performance Indicators that are aimed for assessing the degree to which a provider competently and safely delivers the appropriate clinical services to the patient within the optimal period of time.

The Jawda KPI for cardiac surgery patients in this guidance include measures to monitor morbidity and mortality in patients undergoing cardiac surgery procedures. . Healthcare providers are the most qualified professionals to develop and evaluate quality of care for cardiac surgery patients; therefore, it is crucial that clinicians retain a leadership position in defining performance among cardiac surgery healthcare providers.

Who is this guidance for?

All DoH licensed healthcare facilities providing Cardiac Surgery in the Emirate of Abu Dhabi.

How do I follow this guidance?

Each provider will nominate one member of staff to coordinate, collect, monitor and report Cardiac Surgery quality indicators data as per communicated dates. The nominated healthcare facility lead must in the first instance e-mail their contact details (if different from previous submission) to JAWDA@doh.gov.ae and submit the required quarterly quality performance indicators through Jawda online portal.

What are the Regulation related to this guidance?

- Legislation establishing the Health Sector
- As per DoH Policy for Quality and Patient Safety issued January 15th 2017, this guidance applies to all DOH Licensed Hospital Healthcare Facilities in the Emirate of Abu Dhabi in accordance with the requirements set out in this Standard
- DOH Standard for Centers of Excellence in the Emirate of Abu Dhabi issued March 2019

Pediatric Cardiac Surgery Quality Performance Indicators

Type: PCS Quality Indicator **Indicator Number: PCS 01**

<table>
<tr><td>KPI Description (title):</td><td>Post-operative complications for patient who Undergoing pediatric and congenital cardiac surgery</td></tr>
<tr><td>Domain</td><td>Patient Safety</td></tr>
<tr><td>Sub-Domain</td><td>Complication</td></tr>
<tr><td>Definition:</td><td>Percent of patients (less than 16 years) undergoing pediatric and congenital cardiac surgery that develop postoperative complications within the first 30 days after surgery; or before hospital discharge</td></tr>
<tr><td>Calculation:</td><td>
Numerator
Number of patients (less than 16 years old) undergoing pediatric and congenital cardiac surgery who develop postoperative complication within the first 30 days after surgery; or before hospital discharge

Numerator Inclusions:

<table>
<tr><th colspan="3">Complications list include but not limited to</th></tr>
<tr><td>Bleeding requiring reoperation</td><td>Hemothorax requiring intervention</td><td>Hepatic failure</td></tr>
<tr><td>Arrythmia requiring therapy</td><td>Chylothorax requiring intervention</td><td>Hepatic injury</td></tr>
<tr><td>Endocarditis</td><td>Intracranial hemorrhage</td><td>Intracranial hemorrhage non-stroke</td></tr>
<tr><td>CLABSI, VAP, UTI</td><td>CRRT for acute renal failure</td><td></td></tr>
</table>

Numerator exclusions:

• Pediatric patients who have the above listed conditions/complications which are present on admission

Age category (at date of surgery):
• 1-3 months
• 4-6 months
• 1 year
• 2 year
• 2-16 years

Denominator
All pediatric patients (less than 16 years old) discharged during the reporting period that have undergone a pediatric and congenital cardiac surgery

Denominator exclusion:

• Pediatric patients discharged against medical advice
</td></tr>
</table>

Reporting Frequency:	Quarterly
Unit of Measure:	Percentage
International comparison if available	https://www.sts.org/registries/sts-national-database/congenital-heart-surgery-database
Desired direction:	Lower numbers are better
Data sources and guidance:	-Patient medical record -Hospital administrative data

Type: PCS Quality Indicator **Indicator Number: PCS 02**

KPI Description (title):	**Percent of operative mortality occurring during pediatric and congenital cardiac Surgery**
Domain	Patient Safety
Sub-Domain	Complication
Definition:	Percent of operative mortality in pediatric patients who have undergone pediatric and congenital cardiac Surgery
Calculation:	**Numerator** Number of patients (less than 16 years) undergoing pediatric and congenital cardiac surgery who expire within 30 days after surgery in or out of the hospital. Inclusion: The first operation of hospitalization that has an operation type of cardiopulmonary bypass, Ventricular assist devices (VAD) with cardiopulmonary bypass, VAD without cardiopulmonary bypass **Age category (at date of surgery):** • 1-3 months • 4- 6 months • 1 year • 2 year • 2-16 years **Denominator** All patients (less than 16 years) discharged during the reporting period that have undergone a pediatric and congenital cardiac Surgery
Reporting Frequency:	Quarterly
Unit of Measure:	Percentage
International comparison if available	https://www.sts.org/registries/sts-national-database/congenital-heart-surgery-database

Desired direction:	Lower numbers are better
Data sources and guidance:	-Patient medical record -Hospital administrative data

Type: PCS Quality Indicator **Indicator Number: PCS 03**

KPI Description (title):	**Surgical Site infection for pediatric and congenital cardiac Surgery**
Domain	Patient Safety
Sub-Domain	Complication
Definition:	Percent of patients (less than 16 years) undergoing major cardiac surgery who, within 90 days postoperatively, develop surgical site wound infection involving muscle, bone, and/or mediastinum requiring operative intervention.

Calculation:	**Numerator**
	Number of patients (less than 16 years) who within 90 days postoperatively, develop surgical site infection involving muscle, bone and/or mediastinum requiring operative intervention.
	
	Numerator Guidance:
	• Confirmation of surgical site infection is captured via the medical record
	
	Superficial Incisional SSI: Must meet the following criteria:
	• Infection occurs ≤ 90 days, and involves only skin/subcutaneous tissue of the incision, and patient has ≥ one of the following:
	  ○ Purulent drainage from the superficial incision.
	  ○ Organisms isolated from an aseptically-obtained culture of fluid or tissue from the superficial incision.
	  ○ Superficial incision that is deliberately opened by a surgeon, attending physician or other designee and is culture positive or not cultured and patient has ≥ one of the following:
	  ▪ pain or tenderness
	  ▪ localized swelling
	  ▪ redness
	  ▪ heat
	  ○ A culture with negative findings does not meet this criterion.
	• Diagnosis of a superficial incisional SSI by the surgeon or attending Physician or other designee.
	• There are two specific types of superficial incisional SSIs:
	  ○ Superficial Incisional Primary (SIP) – a superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions

- Superficial Incisional Secondary (SIS) – a superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision

Do not include:

- A stitch abscess alone (minimal inflammation and discharge confined to the points of suture penetration)
- A localized stab wound or pin site infection.
- Diagnosis of "cellulitis" by itself

Deep incisional SSI: Must meet the following criteria

- Infection occurs within 30 days after the operative procedure, AND involves deep soft tissues of the incision (e.g., fascial and muscle layers) AND patient has at least one of the following:
  - Purulent drainage from the deep incision.
  - organism(s) identified from the deep soft tissues of the incision by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST)) or culture or nonculture based microbiologic testing method is not performed, AND patient has at least one of the following signs or symptoms:
    - Fever (>38°C)
    - Localized pain or tenderness
    - An abscess or other evidence of infection involving the deep incision that is detected on direct examination, during invasive procedure, or by histopathologic examination or imaging test.
  - A culture with negative findings does not meet this criterion.

There are two specific types of deep incisional SSIs:

- Deep Incisional Primary (DIP) – a deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions
- Deep Incisional Secondary (DIS) – a deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision

Organ/Space SSI: Must meet the following criteria

- Infection occurs within 30 days after the operative procedure, and infection involves any part of the body, deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure, and patient has at least one of the following:
  - Purulent drainage from a drain that is placed into the organ/space
  - Organisms isolated from an aseptically-obtained culture of fluid or tissue in the organ/space
  - An abscess or other evidence of infection involving the organ/space that is detected on direct examination, during invasive procedure, or by histopathologic examination or imaging test, and meets at least one criterion for a specific organ/space infection of mediastinitis below:

Mediastinitis: Must meet at least 1 of the following criteria:

	• Patient has organisms cultured from mediastinal tissue or fluid obtained during an invasive procedure.
	• Patient has evidence of mediastinitis seen during an invasive procedure or histopathologic examination.
	• Patient has at least 1 of the following signs or symptoms:
	  ○ Fever (>38°C)
	  ○ Chest pain*
	  ○ Sternal instability* and at least 1 of the following:
	  ▪ Purulent discharge from mediastinal area
	• Patient ≤1 year of age has at least one of the following signs or symptoms: fever (>38.0°C), hypothermia (<36.0°C), apnea, bradycardia, or sternal instability And at least one of the following:
	a. purulent drainage from mediastinal area.
	b. mediastinal widening on imaging test
	
	Numerator guidance: SSI Data will be reported to allow infections occurring within 90 days of surgery date to be associated with the surgical procedures as follows:
	For SSI procedures performed in Q1 and required 90 days surveillance , this infection will be reported in Q3 as Q1 data (two quarters behind)
	
	Denominator: All patients (less than 16 years) undergoing major cardiac surgery procedure during the reporting period

Reporting Frequency:	Quarterly
Unit of Measure:	Percentage
International comparison if available	https://www.sts.org/registries/sts-national-database/congenital-heart-surgery-database
Desired direction:	Lower numbers are better
Data sources and guidance:	-Patient medical record -Hospital administrative data

Appendix-1 - Pediatric Cardiac CPT Codes

CPT	Code Description	Category
33010	Pericardiocentesis; initial	Pericardium
33011	Pericardiocentesis; subsequent	Pericardium
33015	Tube pericardiostomy	Pericardium
33020	Pericardiotomy for removal of clot or foreign body (primary procedure)	Pericardium
33025	Creation of pericardial window or partial resection for drainage	Pericardium
33030	Pericardiectomy, subtotal or complete; without cardiopulmonary bypass	Pericardium
33031	Pericardiectomy, subtotal or complete; with cardiopulmonary bypass	Pericardium
33050	Resection of pericardial cyst or tumor	Pericardium
33120	Excision of intracardiac tumor, resection with cardiopulmonary bypass	Cardiac Tumor
33130	Resection of external cardiac tumor	Cardiac Tumor
33140	Transmyocardial laser revascularization, by thoracotomy; (separate procedure)	Transmyocardial revascularization
33141	Transmyocardial laser revascularization, by thoracotomy; performed at the time of other open cardiac procedure(s) (List separately in addition to code for primary procedure)	Transmyocardial revascularization
33202	Insertion of epicardial electrode(s); open incision (eg, thoracotomy, median sternotomy, subxiphoid approach)	Pacemaker or IACD
33203	Insertion of epicardial electrode(s); endoscopic approach (eg, thoracoscopy, pericardioscopy)	Pacemaker or IACD
33206	Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial	Pacemaker or IACD
33207	Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); ventricular	Pacemaker or IACD
33208	Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial and ventricular	Pacemaker or IACD
33210	Insertion or replacement of temporary transvenous single chamber cardiac electrode or pacemaker catheter (separate procedure)	Pacemaker or IACD
33211	Insertion or replacement of temporary transvenous dual chamber pacing electrodes (separate procedure)	Pacemaker or IACD
33212	Insertion of pacemaker pulse generator only; with existing single lead	Pacemaker or IACD
33213	Insertion of pacemaker pulse generator only; with existing dual leads	Pacemaker or IACD
33214	Upgrade of implanted pacemaker system, conversion of single chamber system to dual chamber system (includes removal of previously placed pulse generator, testing of	Pacemaker or IACD

	existing lead, insertion of new lead, insertion of new pulse generator)	
33215	Repositioning of previously implanted transvenous pacemaker or implantable defibrillator (right atrial or right ventricular) electrode	Pacemaker or IACD
33216	Insertion of a single transvenous electrode, permanent pacemaker or implantable defibrillator	Pacemaker or IACD
33217	Insertion of 2 transvenous electrodes, permanent pacemaker or implantable defibrillator	Pacemaker or IACD
33218	Repair of single transvenous electrode, permanent pacemaker or implantable defibrillator	Pacemaker or IACD
33220	Repair of 2 transvenous electrodes for permanent pacemaker or implantable defibrillator	Pacemaker or IACD
33221	Insertion of pacemaker pulse generator only; with existing multiple leads	Pacemaker or IACD
33222	Relocation of skin pocket for pacemaker	Pacemaker or IACD
33223	Relocation of skin pocket for implantable defibrillator	Pacemaker or IACD
33224	Insertion of pacing electrode, cardiac venous system, for left ventricular pacing, with attachment to previously placed pacemaker or implantable defibrillator pulse generator (including revision of pocket, removal, insertion, and/or replacement of existing generator)	Pacemaker or IACD
33225	Insertion of pacing electrode, cardiac venous system, for left ventricular pacing, at time of insertion of implantable defibrillator or pacemaker pulse generator (eg, for upgrade to dual chamber system) (List separately in addition to code for primary procedure)	Pacemaker or IACD
33226	Repositioning of previously implanted cardiac venous system (left ventricular) electrode (including removal, insertion and/or replacement of existing generator)	Pacemaker or IACD
33227	Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; single lead system	Pacemaker or IACD
33228	Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; dual lead system	Pacemaker or IACD
33229	Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; multiple lead system	Pacemaker or IACD
33230	Insertion of implantable defibrillator pulse generator only; with existing dual leads	Pacemaker or IACD
33231	Insertion of implantable defibrillator pulse generator only; with existing multiple leads	Pacemaker or IACD
33233	Removal of permanent pacemaker pulse generator only	Pacemaker or IACD
33234	Removal of transvenous pacemaker electrode(s); single lead system, atrial or ventricular	Pacemaker or IACD
33235	Removal of transvenous pacemaker electrode(s); dual lead system	Pacemaker or IACD

33236	Removal of permanent epicardial pacemaker and electrodes by thoracotomy; single lead system, atrial or ventricular	Pacemaker or IACD
33237	Removal of permanent epicardial pacemaker and electrodes by thoracotomy; dual lead system	Pacemaker or IACD
33238	Removal of permanent transvenous electrode(s) by thoracotomy	Pacemaker or IACD
33240	Insertion of implantable defibrillator pulse generator only; with existing single lead	Pacemaker or IACD
33241	Removal of implantable defibrillator pulse generator only	Pacemaker or IACD
33243	Removal of single or dual chamber implantable defibrillator electrode(s); by thoracotomy	Pacemaker or IACD
33244	Removal of single or dual chamber implantable defibrillator electrode(s); by transvenous extraction	Pacemaker or IACD
33249	Insertion or replacement of permanent implantable defibrillator system, with transvenous lead(s), single or dual chamber	Pacemaker or IACD
33250	Operative ablation of supraventricular arrhythmogenic focus or pathway (eg, Wolff-Parkinson-White, atrioventricular node re-entry), tract(s) and/or focus (foci); without cardiopulmonary bypass	Electrophysiologic Operative Procedures
33251	Operative ablation of supraventricular arrhythmogenic focus or pathway (eg, Wolff-Parkinson-White, atrioventricular node re-entry), tract(s) and/or focus (foci); with cardiopulmonary bypass	Electrophysiologic Operative Procedures
33254	Operative tissue ablation and reconstruction of atria, limited (eg, modified maze procedure)	Electrophysiologic Operative Procedures
33255	Operative tissue ablation and reconstruction of atria, extensive (eg, maze procedure); without cardiopulmonary bypass	Electrophysiologic Operative Procedures
33256	Operative tissue ablation and reconstruction of atria, extensive (eg, maze procedure); with cardiopulmonary bypass	Electrophysiologic Operative Procedures
33257	Operative tissue ablation and reconstruction of atria, performed at the time of other cardiac procedure(s), limited (eg, modified maze procedure) (List separately in addition to code for primary procedure)	Electrophysiologic Operative Procedures
33258	Operative tissue ablation and reconstruction of atria, performed at the time of other cardiac procedure(s), extensive (eg, maze procedure), without cardiopulmonary bypass (List separately in addition to code for primary procedure)	Electrophysiologic Operative Procedures
33259	Operative tissue ablation and reconstruction of atria, performed at the time of other cardiac procedure(s), extensive (eg, maze procedure), with cardiopulmonary bypass (List separately in addition to code for primary procedure)	Electrophysiologic Operative Procedures
33261	Operative ablation of ventricular arrhythmogenic focus with cardiopulmonary bypass	Electrophysiologic Operative Procedures

33262	Removal of implantable defibrillator pulse generator with replacement of implantable defibrillator pulse generator; single lead system	Pacemaker or IACD
33263	Removal of implantable defibrillator pulse generator with replacement of implantable defibrillator pulse generator; dual lead system	Pacemaker or IACD
33264	Removal of implantable defibrillator pulse generator with replacement of implantable defibrillator pulse generator; multiple lead system	Pacemaker or IACD
33265	Endoscopy, surgical; operative tissue ablation and reconstruction of atria, limited (eg, modified maze procedure), without cardiopulmonary bypass	Electrophysiologic Operative Procedures
33266	Endoscopy, surgical; operative tissue ablation and reconstruction of atria, extensive (eg, maze procedure), without cardiopulmonary bypass	Electrophysiologic Operative Procedures
33270	Insertion or replacement of permanent subcutaneous implantable defibrillator system, with subcutaneous electrode, including defibrillation threshold evaluation, induction of arrhythmia, evaluation of sensing for arrhythmia termination, and programming or reprogramming of sensing or therapeutic parameters, when performed	Pacemaker or IACD
33271	Insertion of subcutaneous implantable defibrillator electrode	Pacemaker or IACD
33272	Removal of subcutaneous implantable defibrillator electrode	Pacemaker or IACD
33273	Repositioning of previously implanted subcutaneous implantable defibrillator electrode	Pacemaker or IACD
33282	Implantation of patient-activated cardiac event recorder	Patient-Activated Event Recorder
33284	Removal of an implantable, patient-activated cardiac event recorder	Patient-Activated Event Recorder
33300	Repair of cardiac wound; without bypass	Heart (Including Valves) and Great Vessels
33305	Repair of cardiac wound; with cardiopulmonary bypass	Heart (Including Valves) and Great Vessels
33310	Cardiotomy, exploratory (includes removal of foreign body, atrial or ventricular thrombus); without bypass	Heart (Including Valves) and Great Vessels
33315	Cardiotomy, exploratory (includes removal of foreign body, atrial or ventricular thrombus); with cardiopulmonary bypass	Heart (Including Valves) and Great Vessels
33320	Suture repair of aorta or great vessels; without shunt or cardiopulmonary bypass	Heart (Including Valves) and Great Vessels
33321	Suture repair of aorta or great vessels; with shunt bypass	Heart (Including Valves) and Great Vessels
33322	Suture repair of aorta or great vessels; with cardiopulmonary bypass	Heart (Including Valves) and Great Vessels
33330	Insertion of graft, aorta or great vessels; without shunt, or cardiopulmonary bypass	Heart (Including Valves) and Great Vessels
33335	Insertion of graft, aorta or great vessels; with cardiopulmonary bypass	Heart (Including Valves) and Great Vessels
33340	Percutaneous transcatheter closure of the left atrial appendage with endocardial implant, including fluoroscopy,	Heart (Including Valves) and Great Vessels

	transseptal puncture, catheter placement(s), left atrial angiography, left atrial appendage angiography, when performed, and radiological supervision and interpretation	
33361	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; percutaneous femoral artery approach	Cardiac Valves
33362	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open femoral artery approach	Cardiac Valves
33363	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open axillary artery approach	Cardiac Valves
33364	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open iliac artery approach	Cardiac Valves
33365	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; transaortic approach (eg, median sternotomy, mediastinotomy)	Cardiac Valves
33366	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; transapical exposure (eg, left thoracotomy)	Cardiac Valves
33367	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; cardiopulmonary bypass support with percutaneous peripheral arterial and venous cannulation (eg, femoral vessels) (List separately in addition to code for primary procedure)	Cardiac Valves
33368	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; cardiopulmonary bypass support with open peripheral arterial and venous cannulation (eg, femoral, iliac, axillary vessels) (List separately in addition to code for primary procedure)	Cardiac Valves
33369	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; cardiopulmonary bypass support with central arterial and venous cannulation (eg, aorta, right atrium, pulmonary artery) (List separately in addition to code for primary procedure)	Cardiac Valves
33390	Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; simple (ie, valvotomy, debridement, debulking, and/or simple commissural resuspension)	Cardiac Valves
33391	Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; complex (eg, leaflet extension, leaflet resection, leaflet reconstruction, or annuloplasty)	Cardiac Valves
33404	Construction of apical-aortic conduit	Cardiac Valves
33405	Replacement, aortic valve, open, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve	Cardiac Valves
33406	Replacement, aortic valve, open, with cardiopulmonary bypass; with allograft valve (freehand)	Cardiac Valves
33410	Replacement, aortic valve, open, with cardiopulmonary bypass; with stentless tissue valve	Cardiac Valves
33411	Replacement, aortic valve; with aortic annulus enlargement, noncoronary sinus	Cardiac Valves
33412	Replacement, aortic valve; with transventricular aortic annulus enlargement (Konno procedure)	Cardiac Valves

33413	Replacement, aortic valve; by translocation of autologous pulmonary valve with allograft replacement of pulmonary valve (Ross procedure)	Cardiac Valves
33414	Repair of left ventricular outflow tract obstruction by patch enlargement of the outflow tract	Cardiac Valves
33415	Resection or incision of subvalvular tissue for discrete subvalvular aortic stenosis	Cardiac Valves
33416	Ventriculomyotomy (-myectomy) for idiopathic hypertrophic subaortic stenosis (eg, asymmetric septal hypertrophy)	Cardiac Valves
33417	Aortoplasty (gusset) for supravalvular stenosis	Cardiac Valves
33418	Transcatheter mitral valve repair, percutaneous approach, including transseptal puncture when performed; initial prosthesis	Cardiac Valves
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)	Cardiac Valves
33420	Valvotomy, mitral valve; closed heart	Cardiac Valves
33422	Valvotomy, mitral valve; open heart, with cardiopulmonary bypass	Cardiac Valves
33425	Valvuloplasty, mitral valve, with cardiopulmonary bypass;	Cardiac Valves
33426	Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring	Cardiac Valves
33427	Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring	Cardiac Valves
33430	Replacement, mitral valve, with cardiopulmonary bypass	Cardiac Valves
33460	Valvectomy, tricuspid valve, with cardiopulmonary bypass	Cardiac Valves
33463	Valvuloplasty, tricuspid valve; without ring insertion	Cardiac Valves
33464	Valvuloplasty, tricuspid valve; with ring insertion	Cardiac Valves
33465	Replacement, tricuspid valve, with cardiopulmonary bypass	Cardiac Valves
33468	Tricuspid valve repositioning and plication for Ebstein anomaly	Cardiac Valves
33470	Valvotomy, pulmonary valve, closed heart; transventricular	Cardiac Valves
33471	Valvotomy, pulmonary valve, closed heart; via pulmonary artery	Cardiac Valves
33474	Valvotomy, pulmonary valve, open heart, with cardiopulmonary bypass	Cardiac Valves
33475	Replacement, pulmonary valve	Cardiac Valves
33476	Right ventricular resection for infundibular stenosis, with or without commissurotomy	Cardiac Valves
33477	Transcatheter pulmonary valve implantation, percutaneous approach, including pre-stenting of the valve delivery site, when performed	Cardiac Valves
33478	Outflow tract augmentation (gusset), with or without commissurotomy or infundibular resection	Cardiac Valves
33496	Repair of non-structural prosthetic valve dysfunction with cardiopulmonary bypass (separate procedure)	Cardiac Valves

33500	Repair of coronary arteriovenous or arteriocardiac chamber fistula; with cardiopulmonary bypass	Coronary Artery Anomalies
33501	Repair of coronary arteriovenous or arteriocardiac chamber fistula; without cardiopulmonary bypass	Coronary Artery Anomalies
33502	Repair of anomalous coronary artery from pulmonary artery origin; by ligation	Coronary Artery Anomalies
33503	Repair of anomalous coronary artery from pulmonary artery origin; by graft, without cardiopulmonary bypass	Coronary Artery Anomalies
33504	Repair of anomalous coronary artery from pulmonary artery origin; by graft, with cardiopulmonary bypass	Coronary Artery Anomalies
33505	Repair of anomalous coronary artery from pulmonary artery origin; with construction of intrapulmonary artery tunnel (Takeuchi procedure)	Coronary Artery Anomalies
33506	Repair of anomalous coronary artery from pulmonary artery origin; by translocation from pulmonary artery to aorta	Coronary Artery Anomalies
33507	Repair of anomalous (eg, intramural) aortic origin of coronary artery by unroofing or translocation	Coronary Artery Anomalies
33508	Endoscopy, surgical, including video-assisted harvest of vein(s) for coronary artery bypass procedure (List separately in addition to code for primary procedure)	Endoscopy
33510	Coronary artery bypass, vein only; single coronary venous graft	Venous Grafting Only for Coronary Artery Bypass
33511	Coronary artery bypass, vein only; 2 coronary venous grafts	Venous Grafting Only for Coronary Artery Bypass
33512	Coronary artery bypass, vein only; 3 coronary venous grafts	Venous Grafting Only for Coronary Artery Bypass
33513	Coronary artery bypass, vein only; 4 coronary venous grafts	Venous Grafting Only for Coronary Artery Bypass
33514	Coronary artery bypass, vein only; 5 coronary venous grafts	Venous Grafting Only for Coronary Artery Bypass
33516	Coronary artery bypass, vein only; 6 or more coronary venous grafts	Venous Grafting Only for Coronary Artery Bypass
33517	Coronary artery bypass, using venous graft(s) and arterial graft(s); single vein graft (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas
33518	Coronary artery bypass, using venous graft(s) and arterial graft(s); 2 venous grafts (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas
33519	Coronary artery bypass, using venous graft(s) and arterial graft(s); 3 venous grafts (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas
33521	Coronary artery bypass, using venous graft(s) and arterial graft(s); 4 venous grafts (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas
33522	Coronary artery bypass, using venous graft(s) and arterial graft(s); 5 venous grafts (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas

33523	Coronary artery bypass, using venous graft(s) and arterial graft(s); 6 or more venous grafts (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas
33530	Reoperation, coronary artery bypass procedure or valve procedure, more than 1 month after original operation (List separately in addition to code for primary procedure)	Combined Arterial-Venous Grafting for Coronary Bypas
33533	Coronary artery bypass, using arterial graft(s); single arterial graft	Arterial Grafting for Coronary Artery Bypass
33534	Coronary artery bypass, using arterial graft(s); 2 coronary arterial grafts	Arterial Grafting for Coronary Artery Bypass
33535	Coronary artery bypass, using arterial graft(s); 3 coronary arterial grafts	Arterial Grafting for Coronary Artery Bypass
33536	Coronary artery bypass, using arterial graft(s); 4 or more coronary arterial grafts	Arterial Grafting for Coronary Artery Bypass
33542	Myocardial resection (eg, ventricular aneurysmectomy)	Arterial Grafting for Coronary Artery Bypass
33545	Repair of postinfarction ventricular septal defect, with or without myocardial resection	Arterial Grafting for Coronary Artery Bypass
33548	Surgical ventricular restoration procedure, includes prosthetic patch, when performed (eg, ventricular remodeling, SVR, SAVER, Dor procedures)	Arterial Grafting for Coronary Artery Bypass
33572	Coronary endarterectomy, open, any method, of left anterior descending, circumflex, or right coronary artery performed in conjunction with coronary artery bypass graft procedure, each vessel (List separately in addition to primary procedure)	Coronary Endarterectomy
33600	Closure of atrioventricular valve (mitral or tricuspid) by suture or patch	Single Ventricle and Other Complex Cardiac Anomalies
33602	Closure of semilunar valve (aortic or pulmonary) by suture or patch	Single Ventricle and Other Complex Cardiac Anomalies
33606	Anastomosis of pulmonary artery to aorta (Damus-Kaye-Stansel procedure)	Single Ventricle and Other Complex Cardiac Anomalies
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	Single Ventricle and Other Complex Cardiac Anomalies
33610	Repair of complex cardiac anomalies (eg, single ventricle with subaortic obstruction) by surgical enlargement of ventricular septal defect	Single Ventricle and Other Complex Cardiac Anomalies
33611	Repair of double outlet right ventricle with intraventricular tunnel repair;	Single Ventricle and Other Complex Cardiac Anomalies
33612	Repair of double outlet right ventricle with intraventricular tunnel repair; with repair of right ventricular outflow tract obstruction	Single Ventricle and Other Complex Cardiac Anomalies
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)	Single Ventricle and Other Complex Cardiac Anomalies
33617	Repair of complex cardiac anomalies (eg, single ventricle) by modified Fontan procedure	Single Ventricle and Other Complex Cardiac Anomalies

33619	Repair of single ventricle with aortic outflow obstruction and aortic arch hypoplasia (hypoplastic left heart syndrome) (eg, Norwood procedure)	Single Ventricle and Other Complex Cardiac Anomalies
33620	Application of right and left pulmonary artery bands (eg, hybrid approach stage 1)	Single Ventricle and Other Complex Cardiac Anomalies
33621	Transthoracic insertion of catheter for stent placement with catheter removal and closure (eg, hybrid approach stage 1)	Single Ventricle and Other Complex Cardiac Anomalies
33622	Reconstruction of complex cardiac anomaly (eg, single ventricle or hypoplastic left heart) with palliation of single ventricle with aortic outflow obstruction and aortic arch hypoplasia, creation of cavopulmonary anastomosis, and removal of right and left pulmonary bands (eg, hybrid approach stage 2, Norwood, bidirectional Glenn, pulmonary artery debanding)	Single Ventricle and Other Complex Cardiac Anomalies
33641	Repair atrial septal defect, secundum, with cardiopulmonary bypass, with or without patch	Septal Defect
33645	Direct or patch closure, sinus venosus, with or without anomalous pulmonary venous drainage	Septal Defect
33647	Repair of atrial septal defect and ventricular septal defect, with direct or patch closure	Septal Defect
33660	Repair of incomplete or partial atrioventricular canal (ostium primum atrial septal defect), with or without atrioventricular valve repair	Septal Defect
33665	Repair of intermediate or transitional atrioventricular canal, with or without atrioventricular valve repair	Septal Defect
33670	Repair of complete atrioventricular canal, with or without prosthetic valve	Septal Defect
33675	Closure of multiple ventricular septal defects;	Septal Defect
33676	Closure of multiple ventricular septal defects; with pulmonary valvotomy or infundibular resection (acyanotic)	Septal Defect
33677	Closure of multiple ventricular septal defects; with removal of pulmonary artery band, with or without gusset	Septal Defect
33681	Closure of single ventricular septal defect, with or without patch;	Septal Defect
33684	Closure of single ventricular septal defect, with or without patch; with pulmonary valvotomy or infundibular resection (acyanotic)	Septal Defect
33688	Closure of single ventricular septal defect, with or without patch; with removal of pulmonary artery band, with or without gusset	Septal Defect
33690	Banding of pulmonary artery	Septal Defect
33692	Complete repair tetralogy of Fallot without pulmonary atresia;	Septal Defect
33694	Complete repair tetralogy of Fallot without pulmonary atresia; with transannular patch	Septal Defect
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	Septal Defect

33702	Repair sinus of Valsalva fistula, with cardiopulmonary bypass;	Sinus of Valsalva
33710	Repair sinus of Valsalva fistula, with cardiopulmonary bypass; with repair of ventricular septal defect	Sinus of Valsalva
33720	Repair sinus of Valsalva aneurysm, with cardiopulmonary bypass	Sinus of Valsalva
33722	Closure of aortico-left ventricular tunnel	Sinus of Valsalva
33724	Repair of isolated partial anomalous pulmonary venous return (eg, Scimitar Syndrome)	Venous Anomalies
33726	Repair of pulmonary venous stenosis	Venous Anomalies
33730	Complete repair of anomalous pulmonary venous return (supracardiac, intracardiac, or infracardiac types)	Venous Anomalies
33732	Repair of cor triatriatum or supravalvular mitral ring by resection of left atrial membrane	Venous Anomalies
33735	Atrial septectomy or septostomy; closed heart (Blalock-Hanlon type operation)	Shunting Procedures
33736	Atrial septectomy or septostomy; open heart with cardiopulmonary bypass	Shunting Procedures
33737	Atrial septectomy or septostomy; open heart, with inflow occlusion	Shunting Procedures
33750	Shunt; subclavian to pulmonary artery (Blalock-Taussig type operation)	Shunting Procedures
33755	Shunt; ascending aorta to pulmonary artery (Waterston type operation)	Shunting Procedures
33762	Shunt; descending aorta to pulmonary artery (Potts-Smith type operation)	Shunting Procedures
33764	Shunt; central, with prosthetic graft	Shunting Procedures
33766	Shunt; superior vena cava to pulmonary artery for flow to 1 lung (classical Glenn procedure)	Shunting Procedures
33767	Shunt; superior vena cava to pulmonary artery for flow to both lungs (bidirectional Glenn procedure)	Shunting Procedures
33768	Anastomosis, cavopulmonary, second superior vena cava (List separately in addition to primary procedure)	Shunting Procedures
33770	Repair of transposition of the great arteries with ventricular septal defect and subpulmonary stenosis; without surgical enlargement of ventricular septal defect	Transposition of the Great Vessels
33771	Repair of transposition of the great arteries with ventricular septal defect and subpulmonary stenosis; with surgical enlargement of ventricular septal defect	Transposition of the Great Vessels
33774	Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass;	Transposition of the Great Vessels
33775	Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass; with removal of pulmonary band	Transposition of the Great Vessels
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	Transposition of the Great Vessels

33777	Repair of transposition of the great arteries, atrial baffle procedure (eg, Mustard or Senning type) with cardiopulmonary bypass; with repair of subpulmonic obstruction	Transposition of the Great Vessels
33778	Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type);	Transposition of the Great Vessels
33779	Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type); with removal of pulmonary band	Transposition of the Great Vessels
33780	Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type); with closure of ventricular septal defect	Transposition of the Great Vessels
33781	Repair of transposition of the great arteries, aortic pulmonary artery reconstruction (eg, Jatene type); with repair of subpulmonic obstruction	Transposition of the Great Vessels
33782	Aortic root translocation with ventricular septal defect and pulmonary stenosis repair (ie, Nikaidoh procedure); without coronary ostium reimplantation	Transposition of the Great Vessels
33783	Aortic root translocation with ventricular septal defect and pulmonary stenosis repair (ie, Nikaidoh procedure); with reimplantation of 1 or both coronary ostia	Transposition of the Great Vessels
33786	Total repair, truncus arteriosus (Rastelli type operation)	Truncus Arteriosus
33788	Reimplantation of an anomalous pulmonary artery	Truncus Arteriosus
33800	Aortic suspension (aortopexy) for tracheal decompression (eg, for tracheomalacia) (separate procedure)	Aortic Anomalies
33802	Division of aberrant vessel (vascular ring);	Aortic Anomalies
33803	Division of aberrant vessel (vascular ring); with reanastomosis	Aortic Anomalies
33813	Obliteration of aortopulmonary septal defect; without cardiopulmonary bypass	Aortic Anomalies
33814	Obliteration of aortopulmonary septal defect; with cardiopulmonary bypass	Aortic Anomalies
33820	Repair of patent ductus arteriosus; by ligation	Aortic Anomalies
33822	Repair of patent ductus arteriosus; by division, younger than 18 years	Aortic Anomalies
33824	Repair of patent ductus arteriosus; by division, 18 years and older	Aortic Anomalies
33840	Excision of coarctation of aorta, with or without associated patent ductus arteriosus; with direct anastomosis	Aortic Anomalies
33845	Excision of coarctation of aorta, with or without associated patent ductus arteriosus; with graft	Aortic Anomalies
33851	Excision of coarctation of aorta, with or without associated patent ductus arteriosus; repair using either left subclavian artery or prosthetic material as gusset for enlargement	Aortic Anomalies
33852	Repair of hypoplastic or interrupted aortic arch using autogenous or prosthetic material; without cardiopulmonary bypass	Aortic Anomalies

33853	Repair of hypoplastic or interrupted aortic arch using autogenous or prosthetic material; with cardiopulmonary bypass	Aortic Anomalies
33860	Ascending aorta graft, with cardiopulmonary bypass, includes valve suspension, when performed	Thoracic Aortic Aneurysm
33863	Ascending aorta graft, with cardiopulmonary bypass, with aortic root replacement using valved conduit and coronary reconstruction (eg, Bentall)	Thoracic Aortic Aneurysm
33864	Ascending aorta graft, with cardiopulmonary bypass with valve suspension, with coronary reconstruction and valve-sparing aortic root remodeling (eg, David Procedure, Yacoub Procedure)	Thoracic Aortic Aneurysm
33870	Transverse arch graft, with cardiopulmonary bypass	Thoracic Aortic Aneurysm
33875	Descending thoracic aorta graft, with or without bypass	Thoracic Aortic Aneurysm
33877	Repair of thoracoabdominal aortic aneurysm with graft, with or without cardiopulmonary bypass	Thoracic Aortic Aneurysm
33880	Endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); involving coverage of left subclavian artery origin, initial endoprosthesis plus descending thoracic aortic extension(s), if required, to level of celiac artery origin	Endovascular Repair of Descending Thoracic Aorta
33881	Endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); not involving coverage of left subclavian artery origin, initial endoprosthesis plus descending thoracic aortic extension(s), if required, to level of celiac artery origin	Endovascular Repair of Descending Thoracic Aorta
33883	Placement of proximal extension prosthesis for endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); initial extension	Endovascular Repair of Descending Thoracic Aorta
33884	Placement of proximal extension prosthesis for endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); each additional proximal extension (List separately in addition to code for primary procedure)	Endovascular Repair of Descending Thoracic Aorta
33886	Placement of distal extension prosthesis(s) delayed after endovascular repair of descending thoracic aorta	Endovascular Repair of Descending Thoracic Aorta
33889	Open subclavian to carotid artery transposition performed in conjunction with endovascular repair of descending thoracic aorta, by neck incision, unilateral	Endovascular Repair of Descending Thoracic Aorta
33891	Bypass graft, with other than vein, transcervical retropharyngeal carotid-carotid, performed in conjunction with endovascular repair of descending thoracic aorta, by neck incision	Endovascular Repair of Descending Thoracic Aorta
33910	Pulmonary artery embolectomy; with cardiopulmonary bypass	Pulmonary Artery

33915	Pulmonary artery embolectomy; without cardiopulmonary bypass	Pulmonary Artery
33916	Pulmonary endarterectomy, with or without embolectomy, with cardiopulmonary bypass	Pulmonary Artery
33917	Repair of pulmonary artery stenosis by reconstruction with patch or graft	Pulmonary Artery
33920	Repair of pulmonary atresia with ventricular septal defect, by construction or replacement of conduit from right or left ventricle to pulmonary artery	Pulmonary Artery
33922	Transection of pulmonary artery with cardiopulmonary bypass	Pulmonary Artery
33924	Ligation and takedown of a systemic-to-pulmonary artery shunt, performed in conjunction with a congenital heart procedure (List separately in addition to code for primary procedure)	Pulmonary Artery
33925	Repair of pulmonary artery arborization anomalies by unifocalization; without cardiopulmonary bypass	Pulmonary Artery
33926	Repair of pulmonary artery arborization anomalies by unifocalization; with cardiopulmonary bypass	Pulmonary Artery
33927	Implantation of a total replacement heart system (artificial heart) with recipient cardiectomy	Heart/Lung Transplantation
33928	Removal and replacement of total replacement heart system (artificial heart)	Heart/Lung Transplantation
33929	Removal of a total replacement heart system (artificial heart) for heart transplantation (List separately in addition to code for primary procedure)	Heart/Lung Transplantation
33930	Donor cardiectomy-pneumonectomy (including cold preservation)	Heart/Lung Transplantation
33933	Backbench standard preparation of cadaver donor heart/lung allograft prior to transplantation, including dissection of allograft from surrounding soft tissues to prepare aorta, superior vena cava, inferior vena cava, and trachea for implantation	Heart/Lung Transplantation
33935	Heart-lung transplant with recipient cardiectomy-pneumonectomy	Heart/Lung Transplantation
33940	Donor cardiectomy (including cold preservation)	Heart/Lung Transplantation
33944	Backbench standard preparation of cadaver donor heart allograft prior to transplantation, including dissection of allograft from surrounding soft tissues to prepare aorta, superior vena cava, inferior vena cava, pulmonary artery, and left atrium for implantation	Heart/Lung Transplantation
33945	Heart transplant, with or without recipient cardiectomy	Heart/Lung Transplantation
33946	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; initiation, veno-venous	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33947	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; initiation, veno-arterial	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services

33948	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; daily management, each day, veno-venous	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33949	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; daily management, each day, veno-arterial	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33951	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33952	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), percutaneous, 6 years and older (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33953	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), open, birth through 5 years of age	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33954	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), open, 6 years and older	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33955	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of central cannula(e) by sternotomy or thoracotomy, birth through 5 years of age	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33956	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of central cannula(e) by sternotomy or thoracotomy, 6 years and older	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33957	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33958	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), percutaneous, 6 years and older (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33959	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), open, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services

33962	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), open, 6 years and older (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33963	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition of central cannula(e) by sternotomy or thoracotomy, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33964	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition central cannula(e) by sternotomy or thoracotomy, 6 years and older (includes fluoroscopic guidance, when performed)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33965	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33966	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), percutaneous, 6 years and older	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33967	Insertion of intra-aortic balloon assist device, percutaneous	
33968	Removal of intra-aortic balloon assist device, percutaneous	
33969	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), open, birth through 5 years of age	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33970	Insertion of intra-aortic balloon assist device through the femoral artery, open approach	Cardiac Assist
33971	Removal of intra-aortic balloon assist device including repair of femoral artery, with or without graft	Cardiac Assist
33973	Insertion of intra-aortic balloon assist device through the ascending aorta	Cardiac Assist
33974	Removal of intra-aortic balloon assist device from the ascending aorta, including repair of the ascending aorta, with or without graft	Cardiac Assist
33975	Insertion of ventricular assist device; extracorporeal, single ventricle	Cardiac Assist
33976	Insertion of ventricular assist device; extracorporeal, biventricular	Cardiac Assist
33977	Removal of ventricular assist device; extracorporeal, single ventricle	Cardiac Assist
33978	Removal of ventricular assist device; extracorporeal, biventricular	Cardiac Assist
33979	Insertion of ventricular assist device, implantable intracorporeal, single ventricle	Cardiac Assist

33980	Removal of ventricular assist device, implantable intracorporeal, single ventricle	Cardiac Assist
33981	Replacement of extracorporeal ventricular assist device, single or biventricular, pump(s), single or each pump	Cardiac Assist
33982	Replacement of ventricular assist device pump(s); implantable intracorporeal, single ventricle, without cardiopulmonary bypass	Cardiac Assist
33983	Replacement of ventricular assist device pump(s); implantable intracorporeal, single ventricle, with cardiopulmonary bypass	Cardiac Assist
33984	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), open, 6 years and older	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33985	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of central cannula(e) by sternotomy or thoracotomy, birth through 5 years of age	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33986	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of central cannula(e) by sternotomy or thoracotomy, 6 years and older	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33987	Arterial exposure with creation of graft conduit (eg, chimney graft) to facilitate arterial perfusion for ECMO/ECLS (List separately in addition to code for primary procedure)	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33988	Insertion of left heart vent by thoracic incision (eg, sternotomy, thoracotomy) for ECMO/ECLS	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33989	Removal of left heart vent by thoracic incision (eg, sternotomy, thoracotomy) for ECMO/ECLS	Extracorporeal Membrane Oxygenation or Extracorporeal Life Support Services
33990	Insertion of ventricular assist device, percutaneous including radiological supervision and interpretation; arterial access only	Cardiac Assist
33991	Insertion of ventricular assist device, percutaneous including radiological supervision and interpretation; both arterial and venous access, with transseptal puncture	Cardiac Assist
33992	Removal of percutaneous ventricular assist device at separate and distinct session from insertion	Cardiac Assist
33993	Repositioning of percutaneous ventricular assist device with imaging guidance at separate and distinct session from insertion	Cardiac Assist
33999	Unlisted procedure, cardiac surgery	Other Cardiac Surgery
92992	Atrial septectomy or septostomy; transvenous method, balloon (eg, Rashkind type) (includes cardiac catheterization)	Shunting Procedures
92993	Atrial septectomy or septostomy; blade method (Park septostomy) (includes cardiac catheterization)	Shunting Procedures

93580	Percutaneous transcatheter closure of congenital interatrial communication (ie, Fontan fenestration, atrial septal defect) with implant	Repair of Structural Heart Defect
93581	Percutaneous transcatheter closure of a congenital ventricular septal defect with implant	Repair of Structural Heart Defect
93582	Percutaneous transcatheter closure of patent ductus arteriosus	Repair of Structural Heart Defect
93583	Percutaneous transcatheter septal reduction therapy (eg, alcohol septal ablation) including temporary pacemaker insertion when performed	Repair of Structural Heart Defect
93590	Percutaneous transcatheter closure of paravalvular leak; initial occlusion device, mitral valve	Repair of Structural Heart Defect
93591	Percutaneous transcatheter closure of paravalvular leak; initial occlusion device, aortic valve	Repair of Structural Heart Defect
93592	Percutaneous transcatheter closure of paravalvular leak; each additional occlusion device (List separately in addition to code for primary procedure)	Repair of Structural Heart Defect

Excludes:

- Percutaneous coronary intervention
- Cardioversion
- Brachytherapy
- Thrombolysis
- Cardiac Catheterization
- Echocardiography for congenital cardiac anomalies (Transesophageal/Transthoracic)
- Coronary Angiography
- Intracardiac catheter ablation

Appendix 2 Complications ICD Codes

ICD 10 CM Codes	Code Description
Bleeding requiring reoperation	
I97618	Postprocedural hemorrhage of a circulatory system organ or structure following other circulatory system procedure
I97648	Postprocedural seroma of a circulatory system organ or structure following other circulatory system procedure
I97638	Postprocedural hematoma of a circulatory system organ or structure following other circulatory system procedure
Arrythmia requiring therapy	
I97190	Other postprocedural cardiac functional disturbances following cardiac surgery
UTI	
T814XXA + UTI	Infection following a procedure, initial encounter
T814XXD + UTI	Infection following a procedure, subsequent encounter
T814XXS + UTI	Infection following a procedure, sequela
CLABSI	
T80211A	Bloodstream infection due to central venous catheter, initial encounter
T80211D	Bloodstream infection due to central venous catheter, subsequent encounter
T80211S	Bloodstream infection due to central venous catheter, sequela
VAP	
J95851	Ventilator associated pneumonia
Hemothorax requiring intervention	
J95831	Postprocedural hemorrhage of a respiratory system organ or structure following other procedure
Chylothorax requiring intervention	
J940	Chylous effusion
Endocarditis	
I97190	Other postprocedural cardiac functional disturbances following cardiac surgery
CRRT for acute renal failure	
N990	Postprocedural (acute) (chronic) kidney failure
Hepatic failure	
K9182	Postprocedural hepatic failure
Intracranial hemorrhage	
G9752	Postprocedural hemorrhage of a nervous system organ or structure following other procedure
G9762	Postprocedural hematoma of a nervous system organ or structure following other procedure
G9764	Postprocedural seroma of a nervous system organ or structure following other procedure
I97820	Postprocedural cerebrovascular infarction following cardiac surgery

Other possible complications following cardiac surgery	
I97110	Postprocedural cardiac insufficiency following cardiac surgery
I97120	Postprocedural cardiac arrest following cardiac surgery
I97130	Postprocedural heart failure following cardiac surgery
I97820	Postprocedural cerebrovascular infarction following cardiac surgery
I9789	Other postprocedural complications and disorders of the circulatory system, not elsewhere classified