33016

33016 Pericardiocentesis, including imaging guidance, when performed

The physician drains excess fluid from around the heart. This is a life-saving procedure used to treat cardiac tamponade and for diagnosis and treatment of pericardial effusion. Pericardiocentesis may be performed as a "blind" subxiphoid procedure or with imaging guidance, such as CT, fluoroscopy, or echocardiography to visualize the heart and adjacent organs. Under local anesthesia, the patient is positioned supine or semirecumbent at a 30-60 degree angle to bring the heart closer to the anterior chest wall. A nasogastric tube may be placed to reduce the risk of gastric perforation. A long needle is inserted below the sternum or the left sternocostal margin through the chest wall and into the pericardium, the protective tissue around the heart. When the needle is within the pericardial space, a small catheter and syringe are connected to the needle and excess fluid is aspirated or withdrawn. The needle is removed when no more fluid can be aspirated.

33017-33019

33017 Pericardial drainage with insertion of indwelling catheter, percutaneous, including fluoroscopy and/or ultrasound guidance, when performed; 6 years and older without congenital cardiac anomaly

33018 Pericardial drainage with insertion of indwelling catheter, percutaneous, including fluoroscopy and/or ultrasound guidance, when performed; birth through 5 years of age or any age with congenital cardiac anomaly

33019 Pericardial drainage with insertion of indwelling catheter, percutaneous, including CT guidance

The pericardial sac is a thin, 2-layer membrane surrounding the heart containing a small amount of fluid between the layers that reduces friction. Excess fluid (pericardial effusion) can accumulate between the layers due to infection, malignancy, inflammation, injury, drug reactions, or metabolic disorders and interfere with cardiac function. Pericardial drainage through a percutaneous, indwelling catheter may be performed under fluoroscopy, ultrasound, and/or CT. Under a local anesthetic, a needle is inserted through the chest wall into the tissue surrounding the heart and carefully advanced through the outer membrane of the pericardial sac into the fluid filled cavity. A thin, flexible catheter is threaded through the needle into the pericardial sac and the needle is removed. The catheter is then secured to the chest wall by sutures and/or tape. Once the catheter is secure, fluid may be aspirated initially via a syringe connected to the end of the catheter or the catheter is attached immediately to a drainage bag. Ultrasound guidance requires skin contact with a probe, which is not suitable if the patient has had recent cardiothoracic surgery as probe movement may be impeded by chest incisions and/or dressings. Fluoroscopic guidance does not require contact but may not provide a wide enough field of view or the detailed spatial resolution necessary. Computed tomography (CT) guidance provides enhanced visualization of thoracic and cardiac anatomy including air-filled and bony structures and may be necessary for complicated approaches to the pericardial sac. These codes report percutaneous insertion of an indwelling catheter for pericardial fluid drainage. Code 33019 reports this under CT guidance. Codes 33017-33018 include fluoroscopy and/or ultrasound guidance; 33017 is for patients 6 years or older without a congenital cardiac anomaly and 33018 is for patients from birth through the age of 5 years, or of any age with a congenital cardiac anomaly.

33020

33020 Pericardiotomy for removal of clot or foreign body (primary procedure)

The physician performs a pericardiotomy to remove a blood clot or foreign body from the pericardium via an open approach. The pericardium is the fibrous membrane that covers the heart. The heart is exposed by a subxiphoid approach, median sternotomy, or anterior thoracotomy depending on the planned pericardiotomy site. In the case of blunt trauma resulting in pericardial blood clot, the pericardium is grasped and retracted away from the heart. The pericardium is nicked and blood and fluid are evacuated. The pericardial space is examined, and the blood clot is located and removed. In the case of a foreign body, it is located, grasped with forceps, and removed. A chest tube is placed into the pericardial cavity to drain the pericardial space and additional chest tubes are placed as needed.

33025

33025 Creation of pericardial window or partial resection for drainage

The physician creates a pericardial window or performs a partial resection of the pericardium for drainage using an open approach, which includes subxiphoid approach, median sternotomy, or anterior thoracotomy. Using the preferred subxiphoid approach, the linea alba is divided just below the xiphoid process, which is excised if needed. The peritoneum is retracted and the pericardium is exposed and incised. Fluid is aspirated and sent to the laboratory for culture. A pericardial window or partial resection of the pericardial sac is then performed by resecting a 3-4 cm section of the pericardial sac. The pericardium is examined and a sponge is introduced to break up loculations. A second window may be created in the same manner. A chest tube is placed into the pericardial window to drain the pericardial space.

33030-33031

33030 Pericardiectomy, subtotal or complete; without cardiopulmonary bypass

33031 Pericardiectomy, subtotal or complete; with cardiopulmonary bypass

The physician performs a subtotal or complete pericardiectomy via an open approach. Excision of most or all of the pericardium is typically performed to treat constrictive pericarditis, which is a chronic inflammatory process leading to thickening and fibrosis of the pericardium. A median sternotomy or anterolateral thoracotomy is used to expose the heart. The thickened fibrotic pericardium is incised and anterior dissection of the pericardium is initiated taking care to identify and protect the right and left phrenic nerves. Beginning at the ascending aorta the pericardium is excised using blunt and sharp dissection. Dissection continues over the lateral and posterior walls of the left ventricle, the pulmonary veins, and the pulmonary artery. The diaphragmatic surface of the heart is addressed next, followed by resection over the free wall of the right ventricle, right atrium, and vena cava. Use code 33030 if the procedure is performed without cardiopulmonary bypass. Code 33031 is used when cardiopulmonary bypass is required.

33050

33050 Resection of pericardial cyst or tumor

The physician resects a pericardial cyst or tumor via an open approach. The pericardium is the fibrous membrane that covers the heart. A median sternotomy or anterolateral thoracotomy is used to expose the heart. The thoracic cavity is inspected and the cyst or tumor is located. The right and left phrenic nerves are identified and protected. If the lesion is a cyst, it may be opened with fluid and debris evacuated. The cyst, tumor, or mass is then dissected free of surrounding tissue and removed along with a margin of healthy pericardium. The defect in the pericardium may be covered with a synthetic patch or left open to drain. If it is left open, a chest tube is placed into the defect and an additional chest tube is placed in the pleural space.

33120

33120 Excision of intracardiac tumor, resection with cardiopulmonary bypass

A tumor is removed from the inside of the heart (intracardiac) and any defects caused by the removal are repaired. An incision is made in the skin of the chest and the heart is exposed by median sternotomy. Cardiopulmonary bypass is initiated by cannulating the aorta and the inferior and superior vena cava. Systemic hypothermia is also initiated and the heart is stopped. An incision is made into the involved heart chamber (atriotomy and/or ventriculotomy) and the tumor is exposed and resected. If it is possible to resect the tumor in its entirety and obtain a clear margin of tumor-free heart tissue, then this is performed. If this is not possible, as much of the tumor is excised as possible. The heart defect caused by the tumor excision is then repaired. The patient is weaned off cardiopulmonary bypass, chest tubes are placed as needed, and the chest incision is closed.

33130

33130 Resection of external cardiac tumor

An external cardiac tumor is resected. Cardiac neoplasms may be benign or malignant and may involve the endocardium, myocardium, and/or epicardium. External cardiac tumors are those that lie below the parietal pericardium (the fibrous membrane that surrounds the heart) and involve the epicardium or external surface of the heart muscle. An incision is made in the skin of the chest and the heart is exposed by median sternotomy. The thorax is inspected. The pericardium is incised at the site of the external cardiac tumor, which is exposed and resected. If it is possible to resect the tumor in its entirety and to obtain a clear margin of tumor-free heart tissue, this is performed. If this is not possible, as much of the tumor is excised as is possible. The heart defect caused by the tumor excision is then repaired. Chest tubes are placed as needed and the chest incision is closed.

33140-33141

33140 Transmyocardial laser revascularization, by thoracotomy; (separate procedure)

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 laser revascularization (TMR or TMLR) is performed using an open approach. TMR is performed to improve blood flow in the myocardium (heart muscle). General anesthesia is administered and a double lumen endotracheal tube inserted so that right lung ventilation can be employed allowing better exposure of the heart. The heart is exposed using either a midline sternotomy or anterolateral thoracotomy and the pericardium is incised. The energy level and pulse duration of the laser is set. The laser probe is positioned over the left ventricle in contact with the epicardium. With the aid of a computer the laser beam is directed to the appropriate area of the heart and the laser is fired between heartbeats. The laser creates a one-millimeter channel in the left ventricle that extends from the surface of the heart to internal ventricular chamber. This is repeated 20 to 40 times. The channels on the external surface of the heart typically close quickly. If bleeding from the epicardial surface continues, local pressure or sutures are used to control the bleeding. The channels inside the left ventricle remain open, and as the left ventricle pumps oxygen-rich blood into the aorta, it also sends blood through the laser channels restoring blood flow to the heart muscle. Following completion of TMR, the pericardium is reapproximated and one or more chest tubes placed in the pericardial cavity. Use code 33140 when TMR is performed alone as a separate procedure. Use 33141 when TMR is performed at the time of another open cardiac procedure.

33202-33203

33202 Insertion of epicardial electrode(s); open incision (eg, thoracotomy, median sternotomy, subxiphoid approach)

33203 Insertion of epicardial electrode(s); endoscopic approach (eg, thoracoscopy, pericardioscopy)

Epicardial electrode(s) or lead(s) are inserted through open chest incision in 33202, such as a thoracotomy, median sternotomy, and subxiphoid approach. Epicardial leads are placed on the outer surface of the heart muscle to be stimulated electrically. The chest cavity is opened and the heart is exposed. The electrode(s) are positioned in the appropriate area(s) of heart muscle and affixed there, depending on which device the lead(s) are placed for--whether a single or dual chamber permanent pacemaker or pacing cardioverter defibrillator. Single chamber devices require one electrode inserted into either the atrium or the ventricle. Dual chamber devices require one electrode in the atrium and one in the ventricle. A subcutaneous tunnel is then created from the heart to the pocket under the skin where the device's generator is located, which is usually in the chest under the clavicle or in the upper abdomen under the costal margin. After the lead(s) are placed on the heart muscle, they are tested, guided through the subcutaneous tunnel, connected to the generator, and tested again before incision is closed. These codes report insertion of the epicardial electrode lead(s) only, not the generator. Code 33203 when the lead(s) are placed using an endoscopic approach, such as thoracoscopy or pericardioscopy, as opposed to an open chest incision.

33206

33206 Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial

A permanent cardiac pacemaker system is inserted or replaced, including subcutaneous insertion of the pulse generator and transvenous placement of the endocardial electrodes (leads). Cardiac pacemakers deliver an electronic impulse to the heart at a programmed rate to help the heart maintain a normal heart rhythm. Permanent pacemaker systems may be single chamber (atrial or ventricular) or dual chamber (atrial and ventricular) systems and the leads may be placed either on the surface of the heart (epicardial) or within the heart chamber (endocardial). An incision is made in the skin of the upper chest and the cephalic, subclavian, or jugular vein is exposed. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the selected heart chamber. The lead is positioned against the wall of the heart chamber. If a dual chamber device is required, the second wire is threaded to the selected chamber and the lead positioned against the heart wall. The leads are then tested to verify that they are functioning properly. Next, an incision is made in the skin, typically in the left pectoral region, and a subcutaneous pocket is fashioned. The lead(s) is then connected to the pulse generator and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed. Code 33206 is used for a single chamber pacemaker with the lead in the right atrium and 33207 for a single chamber pacemaker with the lead in the right ventricle. Code 33208 is used for a dual-chamber pacemaker with leads in both the right atrium and right ventricle.

33207-33208

33207 Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); ventricular

33208 Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial and ventricular

A permanent cardiac pacemaker system is inserted or replaced, including subcutaneous insertion of the pulse generator and transvenous placement of the endocardial electrodes (leads). Cardiac pacemakers deliver an electronic impulse to the heart at a programmed rate to help the heart maintain a normal heart rhythm. Permanent pacemaker systems may be single chamber (atrial or ventricular) or dual chamber (atrial and ventricular) systems and the leads may be placed either on the surface of the heart (epicardial) or within the heart chamber (endocardial). An incision is made in the skin of the upper chest and the cephalic, subclavian or jugular vein exposed. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the selected heart chamber. The lead is positioned against the wall of the heart chamber. If a dual chamber device is required, the second wire is threaded to the selected chamber and the lead positioned against the heart wall. The leads are then tested to verify that they are functioning properly. Next, an incision is made in the skin, typically in the left pectoral region, and a subcutaneous pocket fashioned. The lead(s) is(are) then connected to the pulse generator and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed. Code 33206 is used for a single chamber pacemaker with the lead in the right atrium and 33207 for a single chamber pacemaker with the lead in the right ventricle. Code 33208 is used for a dual-chamber pacemaker with leads in both the right atrium and right ventricle.

33210

33210 Insertion or replacement of temporary transvenous single chamber cardiac electrode or pacemaker catheter (separate procedure)

A temporary cardiac pacemaker transvenous electrode or catheter is inserted or replaced. Cardiac pacemakers deliver an electronic impulse to the heart at a programmed rate to help the heart maintain a normal heart rhythm. Temporary pacemakers are used to treat temporary arrhythmias that are expected to resolve or they are used until a permanent pacemaker can be placed. Temporary pacemaker systems may be single chamber (atrial or ventricular) or dual chamber (atrial and ventricular) systems and the leads may be placed either on the surface of the heart (epicardial) or within the heart chamber (endocardial). Transvenous electrode or catheter placement is used when the leads are placed within the heart chamber (endocardial). An incision is made in the skin of the upper chest and the cephalic, subclavian or jugular vein exposed. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the selected heart chamber. The lead is positioned against the wall of the heart chamber. If a dual chamber device is required, the second wire is threaded to the selected chamber and the lead positioned against the heart wall. The leads are then tested to verify that they are functioning properly. The lead(s) is then connected to the pulse generator and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the temporary pulse generator is taped to the skin or attached to a belt worn by the patient. Code 33210 is used for a single chamber pacemaker with the lead placed in the right atrium or right ventricle. Code 33211 is used for a dual chamber pacemaker with leads in both the right atrium and right ventricle.

33211

33211 Insertion or replacement of temporary transvenous dual chamber pacing electrodes (separate procedure)

A temporary cardiac pacemaker transvenous electrode or catheter is inserted or replaced. Cardiac pacemakers deliver an electronic impulse to the heart at a programmed rate to help the heart maintain a normal heart rhythm. Temporary pacemakers are used to treat temporary arrhythmias that are expected to resolve or they are used until a permanent pacemaker can be placed. Temporary pacemaker systems may be single chamber (atrial or ventricular) or dual chamber (atrial and ventricular) systems and the leads may be placed either on the surface of the heart (epicardial) or within the heart chamber (endocardial). Transvenous electrode or catheter placement is used when the leads are placed within the heart chamber (endocardial). An incision is made in the skin of the upper chest and the cephalic, subclavian or jugular vein exposed. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the selected heart chamber. The lead is positioned against the wall of the heart chamber. If a dual chamber device is required, the second wire is threaded to the selected chamber and the lead positioned against the heart wall. The leads are then tested to verify that they are functioning properly. The lead(s) is(are) then connected to the pulse generator and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the temporary pulse generator is taped to the skin or attached to a belt worn by the patient. Code 33210 is used for a single chamber pacemaker with the lead placed in the right atrium or right ventricle. Code 33211 is used for a dual chamber pacemaker with leads in both the right atrium and right ventricle.

33212-33213

33212 Insertion of pacemaker pulse generator only; with existing single lead
33213 Insertion of pacemaker pulse generator only; with existing dual leads

A permanent cardiac pacemaker pulse generator is inserted and attached to an existing lead(s). Cardiac pacemakers deliver an electronic impulse to the heart at a programmed rate to help the heart maintain a normal rhythm. Permanent pacemaker systems have a single lead, dual leads, or multiple leads. The leads may be placed either on the surface of the heart (epicardial) or within the heart chamber (endocardial). For insertion of the pacemaker generator performed alone or at the time of a separately reportable epicardial lead insertion, an incision is made in the skin, typically in the left pectoral region, and a subcutaneous pocket is fashioned. The lead(s) is then connected to the pulse generator and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed. Code 33212 is used for insertion of a pacemaker pulse generator with an existing single lead and 33213 is for insertion of the pulse generator only with existing dual leads.

33214

33214 Upgrade of implanted pacemaker system, conversion of single chamber system to dual chamber system (includes removal of previously placed pulse generator, testing of existing lead, insertion of new lead, insertion of new pulse generator)

The physician upgrades a previously implanted pacemaker system by converting a single chamber system to a dual chamber system. This procedure is typically performed with an existing single chamber ventricular system. Upgrade of the pacemaker system may be performed for a condition referred to as pacemaker syndrome, in which the patient presents with symptoms of heart failure due to retrograde P wave conduction, or for idiopathic hypertrophic subaortic stenosis initially treated with a ventricular pacemaker that needs to be converted to a dual chamber. The pacemaker pocket is opened and the single chamber pulse generator is removed. An incision is made in the skin of the upper chest and the cephalic, subclavian, or jugular vein is exposed. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the right atrium. The lead is positioned against the wall of right atrium. The new right atrial lead is tested to verify that it is functioning properly. The existing right ventricular lead is also tested. The leads are then connected to the pulse generator, and the generator is tested. Once it has been determined that the leads and generator are working properly, the pulse generator is placed into the pocket and sutured to underlying tissue, and the pocket is closed.

33215

33215 Repositioning of previously implanted transvenous pacemaker or implantable defibrillator (right atrial or right ventricular) electrode

Using separately reportable fluoroscopic guidance, a previously placed transvenous pacemaker or implantable defibrillator that has become malpositioned is manipulated into correct position against the wall of the right atrium or right ventricle. Once it has been determined that the leads and generator are working as desired, the pulse generator pocket is closed.

33216-33217

33216 Insertion of a single transvenous electrode, permanent pacemaker or implantable defibrillator
33217 Insertion of 2 transvenous electrodes, permanent pacemaker or implantable defibrillator

The existing electrode wire(s) of a permanent pacemaker or implantable defibrillator is first tested and then removed, if defective, and a new wire is inserted and positioned in either the right atrium and/or right ventricle and reattached to the old, existing generator. Code 33216 is for a single chamber permanent pacemaker or implantable defibrillator electrode and code 33217 is for a dual chambered device with two transvenous electrode wires in the right atrium and the right ventricle. An incision is made in the skin of the upper chest to expose the appropriate vein, such as the cephalic, subclavian, or jugular vein. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the selected heart chamber. The lead is positioned against the wall of the heart chamber. If a dual chamber device is required, the second wire is threaded to the selected chamber and the lead positioned against the heart wall. The leads are then tested to verify that they are functioning properly. The lead(s) is then connected to the pulse generator and the pulse generator is tested.

33218

33218 Repair of single transvenous electrode, permanent pacemaker or implantable defibrillator

A transvenous electrode for a permanent pacemaker or implantable defibrillator is repaired. The electrode wire is first tested. If it is found to malfunction, then the electrode wire is repaired. Types of problems that can be repaired include an electrode fracture, an insulation defect, or a terminal pin defect. An incision is made in the skin of the upper chest and the malfunctioning electrode wire is located. In the case of an electrode fracture, an in-situ repair is performed by placing a sheath and inserting a guidewire into the blood vessel containing the electrode wire. The broken section is then bypassed with a new section of wire. In situ repair of insulation defects or terminal pin defect are performed in a similar fashion by passing a guidewire and then bypassing or repairing the defect. The lead is then tested to verify that it is functioning properly. Code 33218 is used for repair of a single electrode. Code 33220 is used for repair of two transvenous electrodes.

33220

33220 Repair of 2 transvenous electrodes for permanent pacemaker or implantable defibrillator

A transvenous electrode for a permanent pacemaker or implantable defibrillator is repaired. The electrode wire is first tested. If it is found to malfunction, then the electrode wire is repaired. Types of problems that can be repaired include an electrode fracture, an insulation defect, or a terminal pin defect. An incision is made in the skin of the upper chest and the malfunctioning electrode wire is located. In the case of an electrode fracture, an in-situ repair is performed by placing a sheath and inserting a guide-wire into the blood vessel containing the electrode wire. The broken section is then bypassed with a new section of wire. In situ repair of insulation defects or terminal pin defects are performed in a similar fashion by passing a guide wire and then bypassing or repairing the defect. The lead is then tested to verify that it is functioning properly. Code 33218 is used for repair of a single electrode. Code 33220 is used for repair of two transvenous electrodes.

33221

33221 Insertion of pacemaker pulse generator only; with existing multiple leads

A permanent cardiac pacemaker pulse generator is inserted and attached to multiple existing leads. Cardiac pacemakers deliver an electronic impulse to the heart at a programmed rate to help the heart maintain a normal rhythm. Permanent pacemaker systems may have a single lead, dual leads, or multiple leads. The leads may be placed either on the surface of the heart (epicardial) or within the heart chamber (endocardial). If this is the initial insertion of the pacemaker generator performed alone or at the time of a separately reportable epicardial lead insertion, an incision is made in the skin, typically in the left pectoral region, and a subcutaneous pocket is fashioned. The multiple leads are then connected to the pulse generator and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed.

33222-33223

33222 Relocation of skin pocket for pacemaker
33223 Relocation of skin pocket for implantable defibrillator

The skin pocket for the generator of a cardiac device may need to be relocated due to pain or discomfort at the existing site caused by pressure, necrosis, or erosion of the surrounding tissue, a skin pocket hematoma, or an infection. An incision is made over the pacemaker or implantable defibrillator generator and the skin pocket is opened. The generator is removed and the skin pocket is inspected. If a hematoma is present it is evacuated. If an infection is present, the skin pocket may be flushed with an antibiotic solution. The skin and subcutaneous tissue may be debrided. The old skin pocket is then closed. A new site is selected and a skin pocket is fashioned. The leads are connected to the pulse generator and it is tested. Once it has been determined that the leads and generator are functioning properly, the generator is inserted into the new pocket and sutured to underlying tissue. The new skin pocket is closed over the generator. Use 33222 for relocation of the skin pocket for a pacemaker. Use 33223 for relocation of the skin pocket for an implantable defibrillator.

33224-33226

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)
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)
33226 Repositioning of previously implanted cardiac venous system (left ventricular) electrode (including removal, insertion and/or replacement of existing generator)

The physician inserts a pacing electrode in the cardiac venous system for left ventricular pacing and attaches it to a pacemaker or implantable defibrillator. A pacing electrode is placed in the cardiac venous system to pace the left ventricle to treat patients with advanced heart failure. This type of therapy is sometimes referred to as cardiac resynchronization therapy (CRT) or biventricular pacing. Advanced heart failure with a bundle branch block can cause a delay in contraction of the right and left ventricles as well as asynchronous contraction. CRT improves heart function by causing the walls of

the right and left ventricles to contract together in a synchronous fashion. In 33224, a pacing electrode is placed into the coronary sinus vein to pace the left ventricle and attached to a previously placed pacemaker or implantable defibrillator pulse generator. The existing pacemaker or implantable defibrillator generator skin pocket is opened. If the existing generator needs to be replaced, the existing atrial and/or ventricular electrodes are disconnected from the generator, and the existing generator is removed. An incision is made in the skin of the upper chest and the cephalic, subclavian, or jugular vein is exposed. A sheath is inserted into the selected vessel and the pacemaker wire is advanced under radiological guidance into the coronary sinus vein. The lead is then tested to verify that it is functioning properly. The new coronary sinus vein lead and the existing atrial and/or ventricular leads are connected to the new or existing pulse generator, and the pulse generator is tested. Once it has been determined that the leads and generator are working as desired, the pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed. In 33225, a pacing electrode is placed in the coronary sinus vein and a pacemaker or implantable defibrillator generator is inserted at the same encounter. The pacing electrode may be placed at the same encounter as the initial insertion of the generator or when the pacing system is upgraded. In 33226, a malpositioned pacing electrode in the coronary sinus vein is repositioned using separately reportable fluoroscopic guidance.

33227-33228

33227 Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; single lead system

33228 Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; dual lead system

A permanent pacemaker pulse generator is removed, usually due to malfunction or because the generator battery is nearing its end of life, and a new pulse generator is inserted. An incision is made in the skin overlying the existing pulse generator, and the skin pocket is opened. The electrodes are disconnected and the pulse generator is dissected free of surrounding tissue and removed. The new pacemaker pulse generator is then attached to the existing lead(s) and tested. Once it has been determined that the leads and new pulse generator are working as desired, the new pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed. Use 33227 for replacement of the pulse generator in a single lead system. Use 33228 for replacement of the pulse generator in a dual lead system. Use 33229 for replacement of a pulse generator in a multiple lead system.

33229

33229 Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; multiple lead system

A permanent pacemaker pulse generator is removed, usually due to malfunction or when the generator battery is nearing the end of its life, and a new pulse generator is inserted. An incision is made in the skin overlying the existing pulse generator, and the skin pocket is opened. The electrodes are disconnected and the pulse generator is dissected free of surrounding tissue and removed. The new pacemaker pulse generator is then attached to the existing lead(s) and tested. Once it has been determined that the leads and new pulse generator are working as desired, the new pulse generator is placed into the pocket, sutured to underlying tissue, and the pocket is closed. Use 33227 for replacement of the pulse generator in a single lead system. Use 33228 for replacement of the pulse generator in a dual lead system. Use 33229 for replacement of a pulse generator in a multiple lead system.

33230-33231

33230 Insertion of implantable defibrillator pulse generator only; with existing dual leads

33231 Insertion of implantable defibrillator pulse generator only; with existing multiple leads

The physician inserts an implantable defibrillator pulse generator, also referred to as an automatic implantable cardioverter-defibrillator (AICD or ICD), in a patient with dual or multiple existing leads. An AICD is used to monitor the heart's electrical activity continuously as well as provide anti-tachycardia pacing to prevent rapid irregular heart rhythm, backup pacing to maintain a healthy heart rhythm, cardioversion using a mild shock to convert an abnormal heart rhythm to a normal rhythm, or defibrillation using a stronger shock to convert a dangerously abnormal rhythm or restore the heart beat when cardiac arrest has occurred. For insertion of the implantable defibrillator pulse generator only, performed alone or at the time of a separately reportable epicardial lead insertion, an incision is made in the skin, typically in the left pectoral region, and a subcutaneous pocket is fashioned. The leads are then connected to the pulse generator and the generator is tested. Once it has been determined that the leads and generator are working, the pulse generator is placed into the pocket and sutured to underlying tissue, and the pocket is closed. Use 33230 for insertion of an AICD pulse generator only with existing dual leads. Use 33231 for insertion of an AICD pulse generator only with existing multiple leads.

33233

33233 Removal of permanent pacemaker pulse generator only

A permanent pacemaker pulse generator is removed without replacement. The pulse generator may be removed due to pressure necrosis, skin pocket hematoma, or infection. An incision is made in the skin overlying the existing pulse generator, and the skin pocket is opened. The electrodes are disconnected and the pulse generator is dissected free of surrounding tissue and removed. If the pulse generator is being removed because of malfunction or because the battery needs to be replaced, a new pulse generator is inserted. If the pulse generator is being removed for another reason, the skin pocket may be debrided, left open to drain, or closed.

33234-33235

33234 Removal of transvenous pacemaker electrode(s); single lead system, atrial or ventricular

33235 Removal of transvenous pacemaker electrode(s); dual lead system

One or both transvenous pacemaker electrode wires are removed in an atrial or ventricular single lead system (33234) or a dual lead system (33235). One or both electrode wires may need to be removed because of damage to or malfunction of the lead(s), an infection at the site of the generator or lead(s), or interference of blood flow caused by the lead(s). An incision is made in the chest over the pacemaker generator and the lead is disconnected from the generator. There are several techniques used to remove electrodes and the technique selected depends on the amount of scar tissue present and whether the lead has become embedded in the heart muscle (myocardium). If there is not a great deal of scar tissue, an incision is made in the vein containing the electrode and the electrode is extracted by tugging on the lead. If the lead is embedded in the myocardium, the physician may attach a weight to the end of the lead to provide traction that will free the lead from the myocardium. If a great deal of scar tissue is present, a sheath is inserted into the vein containing the electrode wire. The sheath is then threaded over the existing electrode wire and guided to the tip under separately reportable fluoroscopic control. The lead is extracted. If both leads are removed the extraction procedure is repeated using one of the techniques described above.

33236-33237

33236 Removal of permanent epicardial pacemaker and electrodes by thoracotomy; single lead system, atrial or ventricular

33237 Removal of permanent epicardial pacemaker and electrodes by thoracotomy; dual lead system

The pacemaker pocket is opened and the epicardial electrode (lead, wire) disconnected from the generator. The generator is removed and the pocket closed. The physician then opens the chest using a thoracotomy, median sternotomy, subxiphoid, or subcostal approach. The heart is exposed. The epicardial pacemaker electrode is dissected free of any adherent tissue along its course through the thorax and at its attachment to the pericardium. The electrode is removed. Chest tubes are placed as needed and the chest is closed. Use 33236 when a single lead (atrial or ventricular) system is removed and 33237 when a dual lead system is removed.

33238

33238 Removal of permanent transvenous electrode(s) by thoracotomy

The physician removes one or more permanent transvenous (endocardial) electrodes by thoracotomy. Electrode wires may need to be removed because of damage to or malfunction of the lead(s), an infection at the site of the generator or lead(s), or interference of blood flow caused by the lead(s). Thoracotomy is performed when the electrodes cannot be removed via a transvenous approach due to dense scar tissue and adhesions, or because they are deeply embedded in the heart muscle (myocardium). An incision is made in the chest over the pacemaker generator and the lead is disconnected. The heart is exposed by median sternotomy. If cardiopulmonary bypass is required, the aorta is cannulated followed by the superior and inferior vena cava. To remove an atrial electrode, the right atrium is incised. The electrode is dissected free of adhesive scar tissue and removed. If the electrode is in the right ventricle, it may be approached through the right atrium or through an incision in the right ventricle. If the right atrial approach is used, the right ventricle is inverted and the electrode is dissected free of adhesive scar tissue. Heart wall incisions are closed, chest tubes are placed as needed, and the chest is closed.

33240

33240 Insertion of implantable defibrillator pulse generator only; with existing single lead

The physician inserts an implantable defibrillator pulse generator, also referred to as an automatic implantable cardioverter-defibrillator (AICD or ICD) in a patient with an existing single lead. An AICD is used to monitor the heart's electrical activity continuously as well as provide anti-tachycardia pacing to prevent rapid irregular heart rhythm, backup pacing to maintain a healthy heart rhythm, cardioversion using a mild shock to convert an abnormal heart rhythm to a normal rhythm, or defibrillation using a stronger shock to convert a dangerously abnormal rhythm or restore the heart beat when cardiac arrest has occurred.

