DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
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Agenda
ICD-9-CM Coordination and Maintenance Committee
Department of Health and Human Services
Centers for Medicare & Medicaid Services
CMS Auditorium
7500 Security Boulevard
Baltimore, MD 21244-1850
ICD-9-CM Volume 3, Procedures
March 19 – March 20, 2008

Patricia E. Brooks – Introductions and committee overview
Co-Chairperson
March 19, 2008

9:00 AM **ICD-9-CM Volume 3, Procedure presentations and public comments**
Topics:

1. Laparoscopic Robotic Assisted Surgery Pages 7-10	Mady Hue Robert W. Holloway, MD Florida Hospital Cancer Inst.
2. Other Robotic Assisted Surgery Pages 11-14	Mady Hue Devanand A. Dominique, MD Temple University Hospital
3. Total Reconstruction of the Breast Pages 15-20	Amy L. Gruber Bernard T. Lee, MD Beth Israel Deaconess Medical Center
4. Episiotomy and Repair of Spontaneous Lacerations Pages 21- 22	Amy L. Gruber Laurel Durham, MPH, RN Council of Women's and Infant's Specialty Hospitals

5.	Endoscopic Pulmonary Airway Flow Measurement Pages 23-24	Patricia E. Brooks Armin Ernst, MD Beth Israel Deaconess Medical Center
6.	Bilateral Ventricular Assist Devices Pages 25-27	Ann B. Fagan Mark Anderson, MD Robert Wood Johnson Hospital
7.	Addenda Pages 28-32	Mady Hue
8.	ICD-10 Procedure Classification System (PCS) Update	Patricia E. Brooks Rhonda Butler 3M

Registering for the meeting:
Information on registering online to attend the meeting can be found at:
http://www.cms.hhs.gov/apps/events/
For questions about the registration process, please contact Mady Hue at 410-786-4510 or marilu.hue@cms.hhs.gov.

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Summary of Meeting:
A complete report of the procedure part of the meeting, including handouts, will be available on CMS's homepage within one month of the meeting. The summary can be accessed at:

http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes/03_meetings.asp

A summary of the diagnosis part of the meeting held on March 20 can be found at:
http://www.cdc.gov/nchs/icd9.htm

ICD-9-CM TIMELINE

A timeline of important dates in the ICD-9-CM process is described below:

March 19 – March 20 2008	ICD-9-CM Coordination and Maintenance Committee meeting.
April 1, 2008	There will **not** be any new ICD-9-CM codes implemented on April 1, 2008 to capture new technology.
April 11, 2008	Deadline for receipt of public comments on proposed code revisions discussed at the March 19-20, 2008 ICD-9-CM Coordination and Maintenance Committee meetings for implementation on October 1, 2008.
April 2008	Notice of Proposed Rulemaking to be published in the Federal Register as mandated by Public Law 99-509. This notice will include final ICD-9-CM diagnosis and procedure codes for the upcoming fiscal year. It will also include proposed revisions to the DRG system on which the public may comment. The proposed rule can be accessed at: http://www.cms.hhs.gov/AcuteInpatientPPS/IPPS/list.asp
April 2008	Summary report of the Procedure part of the March 19, 2008 ICD-9-CM Coordination and Maintenance Committee meeting will be posted on the CMS homepage as follows: http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes Summary report of the Diagnosis part of the March 20, 2008 ICD-9-CM Coordination and Maintenance Committee meeting report will be posted on the NCHS homepage as follows: http://www.cdc.gov/nchs/icd9.htm
June 2008	Final addendum posted on web pages as follows: Diagnosis addendum at - http://www.cdc.gov/nchs/icd9.htm Procedure addendum at – http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes

June 20, 2008	Deadline for receipt of public comments on proposed **diagnosis** code revisions discussed at the March 19-20, 2008 ICD-9-CM Coordination and Maintenance Committee meetings for implementation on **October 1, 2009.**
July 25, 2008	Those members of the public requesting that topics be discussed at the September 24 – 25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting must have their requests to CMS for procedures and NCHS for diagnoses.
August 1, 2008	Hospital Inpatient Prospective Payment System final rule to be published in the Federal Register as mandated by Public Law 99-509. This rule will also include all the final codes to be implemented on October 1, 2008. This rule can be accessed at: http://www.cms.hhs.gov/AcuteInpatientPPS/IPPS/list.asp
August 2008	Tentative agenda for the Procedure part of the September 24 – 25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting will be posted on CMS homepage at - http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes Tentative agenda for the Diagnosis part of the September 24 – 25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting will be posted on NCHS homepage at - http://www.cdc.gov/nchs/icd9.htm Federal Register notice for the September 24 – 25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting will be published. This will include the tentative agenda.
August 15, 2008	**On-line registration opens for the September 24-25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting at:** **http://www.cms.hhs.gov/apps/events**
September 12, 2008	Because of increased security requirements, those wishing to attend the September 24 - 25, 2008 ICD-9-CM

	Coordination and Maintenance Committee meeting must register for the meeting online at: http://www.cms.hhs.gov/apps/events Attendees must register online by September 12, 2008; failure to do so may result in lack of access to the meeting.
September 24 – 25, 2008	ICD-9-CM Coordination and Maintenance Committee meeting. Those who wish to attend the ICD-9-CM Coordination and Maintenance Committee meeting **must have registered for the meeting online by September 12, 2008.** You must bring an official form of picture identification (such as a drivers license) in order to be admitted to the building.
October 2008	Summary report of the Procedure part of the September 24 – 25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting will be posted on CMS homepage as follows: http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes Summary report of the Diagnosis part of the September 24–25, 2008 ICD-9-CM Coordination and Maintenance Committee meeting report will be posted on NCHS homepage as follows: http://www.cdc.gov/nchs/icd9.htm
October 1, 2008	New and revised ICD-9-CM codes go into effect along with DRG changes. Final addendum posted on web pages as follows: Diagnosis addendum - http://www.cdc.gov/nchs/icd9.htm Procedure addendum at - http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes
October 10, 2008	**Deadline for receipt of public comments on proposed code revisions discussed at the September 24-25, 2008 ICD-9-CM Coordination and Maintenance Committee meetings for implementation of April 1, 2009.**

November 2008	Any new ICD-9-CM codes required to capture new technology that will be implemented on the following April 1 will be announced. Information on any new codes to be implemented April 1, 2009 will be posted on the following websites: http://www.cms.hhs.gov/ICD9ProviderDiagnosticCodes http://www.cdc.gov/nchs/icd9.htm
December 5, 2008	Deadline for receipt of public comments on proposed code revisions discussed at the September 24-25, 2008 ICD-9-CM Coordination and Maintenance Committee meetings for implementation of October 1, 2009.

Laparoscopic Robotic Assisted Surgery

Issue: The ICD-9-CM volume 3, procedure index was updated effective October 1, 2007 to reflect that the classification system does not recognize the use of robotics in surgical procedures. Currently, the index instructs you to only code the actual procedure performed. It has come to our attention that the addition of robotic-assistance to laparoscopic surgery has become a standard surgical approach in the following surgical specialties for select procedures: Urology, Gynecology, General Surgery, Pediatrics and Cardiothoracic Surgery. Should new codes be created to describe the use of robotic assistance in laparoscopic procedures?

New Technology?
No.

Background: The technology associated with robotic laparoscopy is unrelated to computer assisted surgery, considered by the ICD-9-CM Coordination and Maintenance Committee on April 1, 2004. Robotic-assistance is a technology enabler for surgeons performing complex laparoscopic procedures. With it, skilled laparoscopic surgeons obtain 7-degrees of freedom from wristed laparoscopic instruments, a unique three-dimensional view, magnified visualization, elimination of hand tremor and refined ergonomics. These technical advantages give the laparoscopic surgeon increased range of motion, dexterity, precision and reproducibility that are not available with open and/or conventional laparoscopic surgeries. In contrast, computer assisted surgery is associated with image-guided navigation, markers, reference frames, and intra-operative sensing used in intracranial, ENT, orthopedic and spinal surgeries.

During conventional laparoscopic surgery, the surgeon operates standing; using hand-held, long-shafted, straight, rigid laparoscopic instruments; while looking up and away from the instruments, to a nearby 2-D video monitor to see an image of the target anatomy. While laparoscopy has become the standard-of-care for certain surgical procedures, such as laparoscopic cholecystectomy, it has not been widely adopted for more complex or delicate procedures that require fine-tissue manipulation, such as extensive dissection and suturing.

Prior to the introduction of robotic assistance with the *da Vinci* Surgical System, manufactured by Intuitive Surgical (Sunnyvale, California), conversion of complex open procedures to laparoscopy has been hampered by the technical limitations of conventional laparoscopic equipment and instruments. The lack of 3-D visualization of the operative field, the poor ergonomic design and limited control of straight laparoscopic instruments are the primary reasons why adoption of laparoscopic surgery has been limited to a narrow range of procedures.

Description of the Technology: The *da Vinci* Surgical System consists of a(n):

- Ergonomic surgeon's viewing and control console.
- Patient-side cart with four interactive robotic arms.
- High-performance 3-D high-definition (HD) vision system.
- Proprietary *EndoWrist*® (laparoscopic) instruments.

The system seamlessly and directly translates the surgeon's natural hand, wrist and finger movements on instrument controls at the surgeon's console outside the patient's body into corresponding micro-movements of the instrument tips positioned in the patient through 1-2 cm laparoscopic port incisions. When using robotic-assistance, the surgeon operates from a comfortable, seated position at a console that provides superior 3-D HD visualization. While sitting in the console, the high-resolution 3-D stereo viewer provides the surgeon with an immersive experience. Immersed within this console, robotic-assistance permits the surgeon to preserve a natural eye-hand-instrument alignment, depth of field and instrument control similar to that experienced during an open surgical procedure.

The surgeon's eyes and hands are positioned in line with the wristed laparoscopic robotic instruments. These instruments uniquely provide the surgeon with 7-degrees of rotating freedom. In addition, robotic-assisted motion scaling and tremor reduction further interpret and refine the surgeon's hand movements. To move the instruments or to reposition the camera, the surgeon simply moves his/her hands. During a robotic procedure, the surgeon is always in control. The procedure is completed by the surgeon. The system is designed to replicate the surgeon's movements in real time. It cannot make decisions, nor can it perform any type of movement or maneuver without the surgeon's direct input.

Unlike conventional laparoscopic surgery, the target anatomy appears at high magnification, in brilliant color and with natural depth of field for more accurate tissue identification and tissue layer differentiation. This improved visualization enables the surgeon to perform delicate tissue handling and dissection with added precision even in confined spaces. This is especially important to the gynecologic oncologist who needs to visualize and access suspicious tissue and delicately retrieve lymph nodes. With robotic assistance, the gynecologic oncologist is enabled to retrieve difficult to reach left-sided paraortic lymph nodes during a complex laparoscopic hysterectomy on a woman suspected of having cancer. In addition, this robotic precision allows the surgeon to avoid trauma to surrounding structures and tissues, such as the neurovascular bundle located near the prostate during a laparoscopic radical prostatectomy.

In addition, robotic laparoscopic instruments rotate like the human wrist, allowing the surgeon to perform not only complex dissections, but also master difficult suturing and reconstructive surgery within a closed chest, abdomen or pelvis. Hand tremor reduction, motion control and the *EndoWrist*® 7-degrees of freedom enhance ambidexterity.

Together, this achieves a level of surgical precision and control that is beyond the capabilities of the human hand. Finally, the added mechanical strength of the robotic arms permit the surgeon to offer a minimally invasive approach to higher-BMI patients.

Benefits: The major advantages to the surgeon using robotic assistance during a laparoscopic procedure include greater surgical precision, increased range of motion, improved dexterity, motion scaling, natural hand tremor filtration, enhanced visualization and improved access in a closed abdomen, pelvis and chest. With robotic-assistance, surgeons are enabled to more accurately and easily perform complex surgical maneuvers through small "ports," eliminating the need for a large traumatic open surgical wound.

Benefits experienced by the patient who undergoes a robotic laparoscopic procedure, compared to an open surgical procedure, include a shorter hospital stay, less pain, reduced need for post-op pain medication, less risk of infection, less blood loss, fewer transfusions, less scarring, faster recovery and a quicker return to normal daily activities. Post-op recovery from a laparoscopic robotic procedure occurs within days, compared to 6-8 weeks following an open surgical procedure.

Approved Surgical Procedures: The U.S. Food and Drug Administration (FDA) has cleared the *da Vinci*® Surgical System for adult and pediatric use in urologic surgical procedures, general laparoscopic surgical procedures, gynecologic laparoscopic surgical procedures, general non-cardiovascular thoracoscopic surgical procedures and thoracoscopically assisted cardiotomy procedures. Robotic assistance may also be employed with adjunctive mediastinotomy to perform coronary anastomosis during cardiac revascularization. The following laparoscopic procedures are routinely completed with robotic-assistance:

- Urology: Radical prostatectomy, pyeloplasty, cystectomy, nephrectomy, and ureteral reimplantation.
- Gynecology: Hysterectomy, myomectomy and sacrocolpopexy.
- General Surgery: Cholecystectomy, nissen fundoplication, heller myotomy, gastric bypass, donor nephrectomy, adrenalectomy, splenectomy and bowel resection.
- Cardiothoracic: Internal mammary artery mobilization and cardiac tissue ablation, mitral valve repair, atrial septal defect closure, mammary to left anterior descending coronary artery anastomosis for cardiac revascularization with adjunctive mediastinotomy.

In Urology, laparoscopic prostatectomy with robotic assistance has become the standard of care for the treatment of localized prostate cancer. Clinicians and investigators consistently report that, when compared to open and conventional laparoscopic radical prostatectomy, robotic-assistance yields superior oncologic and favorable functional outcomes, evidenced by margin measurements, urinary continence and sexual potency.

In gynecology, surgeons consistently report the importance of precise dissection, especially as it relates to the excision of suspicious tissue and superior lymph node retrieval.

Conclusion: By providing surgeons with superior visualization, enhanced dexterity, greater precision and ergonomic comfort, robotic-assistance makes it possible for more surgeons to perform minimally invasive procedures involving complex dissection or reconstruction. This ultimately raises the standard of care for complex open surgeries that, with the addition of robotic-assistance, can be completed minimally invasively.

It is believed that distinct ICD-9-CM procedure codes are needed for surgeons and their hospitals to track and report the specific clinical and economic outcomes associated with laparoscopic surgeries completed with robotic assistance

Coding Options:
The next topic will be presented prior to reviewing the coding proposal. Please refer to the next agenda topic, Other Robotic Assisted Surgery, for the coding options.

Other Robotic Assisted Surgery

Issue: The ICD-9-CM volume 3, procedure index was updated effective October 1, 2007 to reflect that the classification system does not recognize the use of robotics in surgical procedures. Currently, the index instructs you to only code the actual procedure performed. Existing ICD-9-CM codes describe posterior, lumbar, thoracic or cervical spinal fusion but do not describe the use of a robotic system during these procedures. Should new ICD-9-CM codes that describe robotic assisted [spinal] surgery be created?

New Technology?
No.

Background: Spinal fusion procedures have been performed for many years. Placement of pedicle or facet screws is performed free hand by the surgeon with no real time detailed images or trajectories that account for patient movement, respiration, etc. Using the robot allows the surgeon to most accurately plan the trajectory of the implants to avoid critical structures such as the spinal cord, nerve roots, aorta and vena cava.

Robotic assisted spinal fusion also allows surgeons to percutaneously place pedicle and facet screws, where they may not have been able to in the past because of difficult anatomy, prior surgery or multi-level disease. Surgeons are able to perform multi-level deformity procedures that they were not able to in the past due to the ability to use the robot to visualize and guide the trajectory of the implants.

Technology: The SpineAssist™ System is a bone mounted robotic system that allows surgeons the ability to more accurately place pedicle and facet screws in either open or percutaneous procedures. The System guides and assists the surgeon in placing these devices but does not perform the implant. The SpineAssist™ is used during single or multi-level spinal fusion surgery.

The System consists of two units; the robot and the workstation that performs the pre-planning, image acquisition and control of the robot. The surgeon will first perform the pre-planning where he chooses the implants and plans the trajectory of each implant using the pre-operative CT images on the workstation. Once the pre-planning is complete, the surgeon performs a routine surgical exposure at the desired spinal level(s) and mounts the targeting device to the spinous process or other bony anatomy (for minimally invasive or percutaneous procedures). A CT to Fluoroscopy image registration is performed and the surgeon verifies and approves the results.

The targeting device is then removed and the robotic device is attached. The robot is guided to the appropriate positions and the surgeon performs the implantation of either pedicle or facet screws.

Accurate positioning of pedicle or facet screws is critical given the proximity of the spinal cord, nerve roots, aorta and vena cava. The robot can guide surgeons to precisely place these devices even when anatomical structures are missing.

Indications: Any patient who has spinal fusion with insertion of pedicle or facet screws could be a candidate for robotic assisted spinal fusion. It is believed that robotic assisted surgery offers significant benefits for multi-level spinal fusions, spinal deformity, revision procedures, and minimally invasive, percutaneous procedures.

Benefits:
The goal of the procedure is to aid the surgeon in positioning pedicle and facet screws. Accurate placement of these devices is critical to ensuring the stability of the spine which helps alleviate pain. Accurate placement ensures the best bone/device interface which helps promote fusion. Accurate placement also helps prevents device breakage, which has been widely reported in the literature and can lead to revisions and further surgery.

Conclusion: The SpineAssist™ System may offer surgeons the ability to perform robotic assisted surgery on patients with difficult anatomy, multi-level disease, or severe deformity that previously they were not able to try because of the limitation with manual methods. The ability to register CT scans to the patient's anatomy real time eliminates errors in placement due to patient movement, respiration, or surgical interference.

Studies [1] have shown the SpineAssist™ to have accurate placement in 93% of case with clinically accepted placement of pedicle or facet screws in 99% of cases.

Coding Options:

Option 1: Do not create new codes. Continue to follow the index as currently instructed and only code the procedure being performed.

Robotic assisted surgery- *see* specific procedure (surgery), by site

Option 2: Create a new subcategory and two new codes to identify that the use of robotics was used in the procedure that was performed.

New subcategory 17.4 Robotic assisted procedures
Code first primary procedure
Excludes: computer assisted surgery (00.31-00.35, 00.39)

New code 17.41 Laparoscopic robotic assisted procedure

[1] Shoman M, Lieberman H, Benzel D. Robotic assisted spinal surgery – from concept to clinical practice. Computer Aided Surgery, 2007; 12(2): 105-115.

New code 17.49 Other and unspecified robotic assisted procedure
Excludes: laparoscopic robotic assisted procedure (17.41)

Revise subterm Robotic assisted surgery ~~– *see* specific procedure (surgery), by site~~
Add subterm laparoscopic 17.41
Add subterm other and unspecified 17.49

36.33 Endoscopic transmyocardial revascularization
Delete inclusion term ~~Robot-assisted transmyocardial revascularization~~

Option 3: Create a new subcategory and six new codes to identify that the use of robotics was used in the procedure that was performed.

New subcategory 17.4 Robotic assisted procedures
Code first primary procedure
Excludes: computer assisted surgery (00.31-00.35, 00.39)

New code 17.41 Open robotic assisted procedure

New code 17.42 Laparoscopic robotic assisted procedure

New code 17.43 Percutaneous robotic assisted procedure

New code 17.44 Endoscopic robotic assisted procedure

New code 17.45 Thoracoscopic robotic assisted procedure

New code 17.49 Other and unspecified robotic assisted procedure
Excludes: endoscopic robotic assisted procedure (17.44)
laparoscopic robotic assisted procedure (17.42)
open robotic assisted procedure (17.41)
percutaneous robotic assisted procedure (17.43)
thoracoscopic robotic assisted procedure (17.45)

Revise subterm Robotic assisted surgery ~~– *see* specific procedure (surgery), by site~~
Add subterm endoscopic 17.44
Add subterm laparoscopic 17.42
Add subterm open 17.41
Add subterm other and unspecified 17.49
Add subterm percutaneous 17.43

Add subterm thoracoscopic 17.45

36.33 Endoscopic transmyocardial revascularization

Delete inclusion term ~~Robot-assisted transmyocardial revascularization~~

CMS Recommendation: CMS recommends option 3, create a new subcategory and six new codes to identify the use of robotics was used during a procedure and revising the current index and tabular entries.

Interim coding:
Continue to follow the index as currently instructed and only code the procedure being performed.

Total Reconstruction of the Breast

Issue:
Reconstruction of the breast after mastectomy is an evolving field. With the development of increasingly complex procedures, the current ICD-9-CM procedure code 85.7, Total reconstruction of breast, no longer sufficiently distinguishes among the different types of breast reconstruction after mastectomy. The surgical techniques vary greatly in complexity and amount of resources used. The lack of specificity of this code makes it difficult to accurately track the type of breast reconstruction performed.

New Technology Application? No.

Background:
One in eight women in the United States will develop breast cancer. Despite the many changes in breast cancer care, surgery remains the primary approach to treating patients with breast cancer. Removal of the cancerous tissue can be achieved through either breast conserving surgery (partial mastectomy) or removal of the entire breast (total mastectomy). Both of these treatments can result in considerable asymmetry of the breasts.

Due to the multiple advances in reconstructive techniques, breast reconstruction has become an essential component of the overall treatment plan of breast cancer patients. Breast reconstruction offers restoration of breast symmetry by creating a breast mound that is similar in size, shape, contour, and position to the opposite breast.

The goal of breast reconstruction is to deliver care that incorporates the six Institute of Medicine dimensions of care: safe, effective, patient-centered, timely, efficient, and equitable. The ideal reconstructive procedure would be performed at the time of mastectomy or soon after (timely), have the quickest recovery (efficient) with the least amount of disturbance to the surrounding structures (safe). It would be the most natural appearing (patient centered) and the longest lasting (effective). Finally, the patient would have equal access to choose among the multiple reconstructive types that exist (equitable). Unfortunately, no one reconstructive procedure fits all six criteria. Instead, the reconstructive techniques vary greatly in complexity and amount of resources used, requiring the patient to carefully choose the procedure that best suits her needs.

Overall, the wide spectrum of reconstructive techniques can be divided into seven main categories: 1) implant, 2) latissimus flap, 3) pedicled transverse rectus abdominis musculocutanous (TRAM) flap, 4) free TRAM flap, 5) deep inferior epigastric perforator (DIEP) flap, 6) superficial inferior epigastric artery (SIEA) flap, and 7) gluteal artery perforator (GAP) flap. The following section will provide a historical context to the current status of breast reconstruction.

Implant: The earliest type of reconstruction was the implant, which was developed in the 1960s using saline or silicone breast prostheses. Implants are attractive because they provide a relatively simple solution to a difficult problem. This procedure is by far the

easiest to perform, with shorter operative times and postoperative recovery than other methods. It has few short term complications and does not require any additional incisions beyond the mastectomy site. Despite the appeal, implant reconstruction has some significant limitations. The list of implant-related complications is lengthy and their frequency increases over time. The most common complications include asymmetry, malposition, implant rupture, deflation, and capsular contracture in which the scar tissue around the implant contracts causing distortion and pain. Up to 57% of women who have undergone implant reconstruction will return for reoperation to correct these complications. Moreover, women's satisfaction with the cosmetic results begins at a lower level and deteriorates over time. While implant reconstruction continues to be a popular option, its high failure rate has led to the development of autologous breast reconstruction in which the patient's own muscle, fat, and skin are used to create a new breast; these techniques are described below.

Latissimus flap: In the 1970s, the latissimus flap became popular due to its promise of better results with less scarring. This technique is an example of a pedicled flap in which the flap remains attached to its original blood supply while being rotated to a new location. The back's latissimis dorsi muscle and its overlying skin and fat are raised and transferred to the anterior chest wall. The limited volume of this flap allows the reconstruction of small to moderate sized breasts. Due to the size limitation, this technique is most commonly used in combination with an implant. The implant provides adequate volume for breast reconstruction while the latissimus flap serves as a flat muscle layer for protection from capsular contracture. The latissimus flap is known to be a safe and reliable flap with a good blood supply minimizing the risk of fat necrosis or flap loss. The main disadvantage of this procedure is a high rate of donor-site seroma in up to 80% of patients. The use of this flap also results in a donor scar where the flap was designed on the back. Despite the total loss of the latissimus dorsi function, multiple studies have demonstrated that patients have few subjective complaints and objective findings related to loss of shoulder motion and strength.

Transverse Rectus Abdominis Myocutaneous (TRAM) flap: In 1982, Hartrampf and colleagues described a new flap for breast reconstruction based off the rectus abdominis muscle in the abdomen. The rectus abdominis muscle receives a dual blood supply from the superior epigastric and the inferior epigastric vasculatures. These arteries and veins run beneath the rectus muscle and send perforating vessels outwards to the overlying fat and skin. This dual blood supply and its proximity to the breast make the tissue ideal for breast reconstruction. Furthermore, the abdominal flap provides enough bulk to eliminate the need of implants, creating a true autologous breast reconstruction. Today, this flap is widely known as the TRAM flap. The TRAM flap, along with its many surgical variations, has become the most popular choice for autologous breast reconstruction.

Pedicled TRAM flap: In the pedicled TRAM technique, the flap has its blood supply based on the superior epigastric artery and veins. The flap of muscle, fat and skin is dissected free and rotated through a subcutaneous tunnel into the mastectomy defect. The flap is then shaped into the form of a breast and sutured to its proper location.

Free TRAM flap: In the early 1990s, the technological advance of microvascular anastomosis allowed the development of the free TRAM. In this case, the flap is based on the inferior blood supply, the deep inferior epigastric artery and veins. The flap, along with the inferior vascular pedicle, is dissected free and detached from the patient's body. Then, the flap is brought to mastectomy site where the deep inferior epigastric vessels are reconnected to vessels in the chest. These vessels are 1 to 3 mm in diameter, and a microscope is usually used for the anastomosis.

The pedicled and free TRAM flaps have several differences. Most reconstructive surgeons would agree that the perfusion of the free TRAM is superior to that of the pedicled TRAM. The better blood supply of the free TRAM allows a more consistent and reliable healing with lower rates of fat necrosis or partial flap loss due to ischemia. On the down side, however, free TRAM flap reconstruction is generally more costly and more time-consuming. It carries a small risk of total flap loss due to thrombosis in either the artery or vein, resulting in emergent reoperation. Overall, there is no consensus among surgeons as to which technique is the preferred procedure for routine autologous reconstruction based on the abdominal tissues.

The TRAM flap can create a soft and symmetrical breast mound. Despite the many surgical variations, all methods of the TRAM flap reconstruction are subject to hernias, contour abnormalities, and weakness of the abdominal wall. Because a portion of rectus muscle and fascia is harvested, the abdominal hernia rate can be up to 11.6%. Furthermore, studies on abdominal wall strength indicate a decreased ability to do sit-ups.

Deep Inferior Epigastric Perforator (DIEP) flap: In the late 1990s and into the third millennium, we have seen refinements of these autologous techniques, including the development of the DIEP flap. This flap is composed of abdominal skin and fat and is based on the deep inferior epigastric vessels. The important difference between the DIEP flap and the free TRAM flap is that the DIEP flap does not depend on harvest of the rectus muscle as a vascular carrier. Instead, the rectus muscle remains intact as the perforating blood vessels are dissected free, hence the term "perforator flap." By preserving the abdominal muscle as much as possible, the risk of complications such as abdominal weakness and herniation is markedly lower. Proponents of this technique report that the DIEP flap is associated with less postoperative pain, shorter hospitalization, prompter recovery, and little or no functional deficit in the abdominal donor site. With increased understanding of the anatomy and physiology of the DIEP flap, many surgeons have chosen to primarily use the DIEP flap, with the free TRAM as a back-up procedure for autologous reconstruction. Despite the reported advantages, the DIEP flap has been slow to gain widespread popularity due to the high consumption of hospital resources, long operating times, and need of microsurgical expertise. The DIEP flap is technically demanding, requiring surgeons trained in microsurgery to finely dissect the perforating vessels from the surrounding muscle. The microvascular dissection period typically adds another 2 hours to the operative time of the free TRAM flap. Furthermore, intense nursing care is required for the first 12 to 24 hours to ensure that the breast flap remains viable in the immediate postoperative period. Since this technique's inception in 1992, more than 50 institutions across the country have adopted this

procedure. Due to the low rate of complication and high patient satisfaction, many of these institutions offer the DIEP flap as the ideal reconstructive procedure.

Superficial Inferior Epigastric Artery (SIEA) flap: The SIEA flap is very similar to the DIEP flap in that it uses the same abdominal tissue for breast reconstruction, but instead the flap is supplied by the superficial inferior epigastric artery and veins. This superficial vessel has a unique anatomy that arises from the common femoral artery and directly supplies the abdominal subcutaneous tissue without traversing through the abdominal muscle. Due to this unique anatomy, no microvascular dissection is performed through the rectus abdominis muscle. Thus, there is no risk of a new abdominal hernia and even less abdominal pain compared with other abdominal flaps. However, the SIEA flap is limited by the variability in its vascular anatomy and skin territory. The SIEA and vein are only consistently present in 65% of patients. Furthermore, the caliber of the vessels is often too small to reliably support sufficient tissue for a breast reconstruction. Overall, the complications for the SIEA flap are similar to those for the DIEP flap. While the SIEA flap is a safe procedure, patients must be carefully selected before undergoing this procedure.

Gluteal Artery Perforator (GAP) flap: Many other perforator flaps are available if the patient is unable to have autologous reconstruction based on the abdominal tissues. Skin and fat from the lower buttock region can be used to reconstruct a breast. Depending on the vasculature of the flap, the variations may be known as the superior gluteal artery perforator (SGAP) flap or the inferior gluteal artery perforator (IGAP) flap. Like the DIEP flap, the GAP flap requires a lengthy period of microdissection to isolate the perforating vessels from the surrounding muscle. By preserving the gluteus maximus muscle, the donor-site morbidity is minimal. The total complication rate for the GAP flap is similar to the other perforator flap procedures.

Overall, the multiple reconstructive options are significantly different in terms of resources consumed and final outcomes. The following chart highlights the major differences among the autologous reconstructive techniques:

	Pedicled Latissimus flap	**Pedicled TRAM flap**	**Free TRAM flap**	**DIEP flap**	**SIEA flap**	**GAP flap**
Historical development	1970s	1980s	Early 1990s	Mid 1990s	Late 1990s	Late 1990s
Donor location	Back	Abdomen	Abdomen	Abdomen	Abdomen	Gluteal
Tissues used	Muscle, fat, skin	Muscle, fat, skin	Muscle, fat, skin	Fat, skin	Fat, skin	Fat, skin
Surgical technique	Remains attached	Remains attached	Dissected free, Microvascular anastomosis	Dissected free, Microvascular dissection, Microvascular anastomosis	Dissected free, Microvascular anastomosis	Dissected free, Microvascular dissection, Microvascular anastomosis
Implant	Sometimes	None	None	None	None	None

Specific factors: – OR time (hours) – Days in ICU – Length of stay (days) – Total flap loss (%) – Total complication rate (%) – Good cosmetic appearance (%) – High patient satisfaction (%)	 3.6 * 0 * 7.1 [33] 1.0 [15] 48–81 [13, 15, 16] 69–85 [13, 15] 87 [13]	 4.1*–4.8 [21] 0.1 * 4.7–5.8 [21, 22] 0–1.1 [20, 24] 25–41 [20-22] 67–83 [20, 25] 76–79 [20, 25]	 6.5*–11 [21, 36] 1.8 * 5.1–7.7 [21, 32, 36] 0.9–4.9 [20, 21] 38–54 [20, 30] 65–70 [20, 25] 78–80 [20, 25]	 5.8–11 [36-38] 1.1 * 4.7–8.5 [32, 33, 38] 0.5–5.9 [28, 35] 30 [28] 93 [43] 93 [43]	 8.6–9.0 [38, 40] 1.3 * 4.2–9.3 [38, 40] 0–7.1 [40, 41] 27–32 [40, 41] 100 [44] 100 [44]	 5.3–12* [42] 1.2 * 4.2 [42] 3 [42] 22 [42] --- ---
Current ICD-9-CM code	85.85	85.7	85.7	85.7	85.7	85.7

* Based on Beth Israel Deaconess Medical Center's experience with unilateral breast reconstruction

Current Coding:

Breast implants for reconstruction are assigned code 85.53, Unilateral breast implant, and 85.54, Bilateral breast implant. The latissimus dorsi myocutaneous flap is assigned code 85.85, Muscle flap graft to breast. However, all other breast reconstructions, including the pedicled TRAM, free TRAM, DIEP, SIEA, and GAP flaps are assigned to code 85.7, Total reconstruction of breast.

Options:

1. Continue to code reconstruction of the breast to code 85.7, Total reconstruction of breast.
2. Create a new subcategory 85.7, Total reconstruction of breast, and add new codes to differentiate the various autologous reconstructive procedures.

85.7 Total reconstruction of breast

New code 85.70 Total reconstruction of breast, not otherwise specified
Perforator flap, free

New code 85.71 Latissimus dorsi myocutaneous flap

New code 85.72 Transverse rectus abdominis myocutaneous (TRAM) flap, not otherwise specified
Excludes: transverse rectus abdominis myocutaneous (TRAM) flap, free (85.74)
transverse rectus abdominis myocutaneous (TRAM) flap, pedicled (85.73)

New code 85.73 Transverse rectus abdominis myocutaneous (TRAM) flap, pedicled
Excludes: transverse rectus abdominis myocutaneous (TRAM) flap, free (85.74)
transverse rectus abdominis myocutaneous (TRAM) flap, not otherwise specified (85.72)

New code 85.74 Transverse rectus abdominis myocutaneous (TRAM) flap, free

Excludes: transverse rectus abdominis myocutaneous (TRAM) flap, not otherwise specified (85.72)
transverse rectus abdominis myocutaneous (TRAM) flap, pedicled (85.73)

New code 85.75 Deep inferior epigastric artery perforator (DIEP) flap, free

New code 85.76 Superficial inferior epigastric artery (SIEA) flap, free

New code 85.77 Gluteal artery perforator (GAP) flap, free

New code 85.79 Other total reconstruction of breast

Excludes: deep inferior epigastric artery perforator (DIEP) flap, free (85.75)
gluteal artery perforator (GAP) flap, free (85.77)
latissimus dorsi myocutaneous flap (85.71)
superficial inferior epigastric artery (SIEA) flap, free (85.76)
total reconstruction of breast, not otherwise specified perforator flap, free (85.70)
transverse rectus abdominis myocutaneous (TRAM) flap, free (85.74)
transverse rectus abdominis myocutaneous (TRAM) flap, not otherwise specified (85.72)
transverse rectus abdominis myocutaneous (TRAM) flap, pedicled (85.73)

CMS's Recommendation:

Option 2. As stated above.

In the interim, continue to assign total reconstructive procedures of the breast to code 85.7, Total reconstruction of breast.

Episiotomy and Repair of Spontaneous Lacerations

Issue:
Current coding guidance states that an episiotomy that extends spontaneously is considered to be a laceration. Repair of the extension and laceration is assigned to the appropriate code under category 75.6, Repair of other current obstetric laceration, (codes 75.61-75.69). Code 73.6, Episiotomy, would not be assigned. (AHA Coding Clinic, First Quarter 1992, pages 10-11). However, clinically it is important to note all patients who have an episiotomy, and further have access to data that can differentiate those patients who have an extension of this episiotomy from those having a spontaneous laceration.

New Technology Application? No.

Background:
Episiotomy is a surgical incision through the perineum made to enlarge the vagina and assist childbirth. The American College of Obstetrics and Gynecology (ACOG) recommends restricted, rather than routine, use of episiotomy. ACOG suggests that routine episiotomy does not prevent pelvic floor damage leading to incontinence; while there is concern that episiotomy (particularly with operative vaginal deliveries) may actually increase the risk of perineal lacerations.

Patients are increasingly interested in the episiotomy rates of providers, and provider rates are often gathered through the use of ICD-9-CM procedure coded data. This coded information will likely be available to the public sector and transparency is a goal of health care systems across the country. It is critical that the coded information accurately reflect the clinical practice that is being represented. It is felt that the above guidance and practice of coding episiotomy and lacerations does not accurately reflect clinical practice; it inaccurately reports the episiotomy rate, and does not allow proper tracking of episiotomies that extend spontaneously. This is a disservice to both the public sector that does not have access to an accurate report of the information they often request, as well as to the providers who may be inaccurately described. Lastly, the relative ease of obtaining coded data make this data the primary source for many efforts to identify areas of clinical concern and to improve quality of care. Accurate information is critical to the success of these efforts.

Options:

Option 1: Continue to code repair of the extension of the episiotomy and laceration to the appropriate code under category 75.6, Repair of other current obstetric laceration (codes 75.61-75.69).

Option 2: Allow for the coding of episiotomy and laceration codes if the episiotomy extends spontaneously.

75.6 Repair of other current obstetric laceration
Add code also note <u>Code also episiotomy, if performed (73.6)</u>

75.61 Repair of current obstetric laceration of bladder and urethra
75.62 Repair of current obstetric laceration of rectum and sphincter ani
75.69 Repair of other current obstetric laceration
Episioperineorrhaphy
Repair of:
pelvic floor
perineum
vagina
vulva
Secondary repair of episiotomy
Delete exclusion term Excludes: repair of routine episiotomy (73.6)

CMS's Recommendation:

Option 2. As stated above.

In the interim, continue to code repair of the extension of the episiotomy and laceration to the appropriate code under category 75.6, Repair of other current obstetric laceration (codes 75.61-75.69).

Endoscopic Pulmonary Airway Flow Measurement

Issue:
A new type of assessment of intrapulmonary air flow may be important in evaluating patients with various types of lung disease. There is not a unique code to identify patients undergoing endoscopic pulmonary air flow assessment.

New Technology: Undecided.

Background:
Pulmonx is developing a new technology called the Chartis System Functional Assessment System (FAS) that provides information on a patient's pulmonary airflow. Specifically, the company is developing a means of measuring intrapulmonary airflow using intrapulmonary balloon catheters inserted into diseased portions of the lung during bronchoscopy. This information may help in such clinical scenarios as selecting appropriate patients for endobronchial valve therapy or lung volume reduction surgery.

The Chartis System FAS is not currently approved by the Food and Drug Administration (FDA). However, Pulmonx is hoping for FDA approval in the spring of 2008. The company anticipates the Chartis System FAS will be on the market by October 1, 2008.

The data suggests that the Chartis System may be utilized to diagnose the presence of collateral airflow between lobes of the lung. Collateral airflow may be of significant interest to physicians treating patients with severe emphysema, which causes diseased portions of the lung to trap air and hyperinflate because damaged airways collapse during exhalation, preventing air from escaping. Both endobronchial valve therapy (EBV) and lung volume reduction surgery (LVRS) are predicated on the principle of reducing the volume of the diseased portion of the lung so that air is redirected to healthier areas of the lung. This provides better gas exchange and more effective pulmonary physiology. In LVRS diseased lung tissue is simply removed, and EBV therapy uses small, one way valves to allow air out of a lobe of the lung but not in, creating a state of relative atelectasis or collapse. Collateral airflow occurs when air is allowed to enter diseased portions of the lung through alternate airways, much like collateral circulation can occur around a blocked blood vessel. Collateral airflow is at odds with the intent to reduce lung volume in diseased areas. Thus, the measurement of collateral circulation may be useful in identifying which patients may benefit most from various types of therapy.

It is also theorized that the Chartis System may be used to measure the effectiveness of current treatments and the disease progression of other chronic obstructive pulmonary diseases. By evaluating the airflow in isolated lung regions, current and future therapies can be directed to the optimal site for treatment. Subsequently, the areas of the lung can be measured to evaluate the success of the treatment or progression of the disease.

Currently, these patients would be captured by a code for the lung bronchoscopy (33.22, Fiber-optic bronchoscopy).

Coding Options

Option 1. Continue capturing these procedures by assigning a code for the fiber-optic bronchoscopy (33.22)

Option 2. Create a new code for the procedure as follows:

New Code: 33.72 Endoscopic pulmonary airway flow measurement

Recommendation: CMS recommends option 2; create a new code for endoscopic pulmonary airway flow measurement. In the meantime continue to identify this procedure through code 33.22 (Fiber-optic bronchoscopy).

Implantation of Bilateral Ventricular Assist Devices

Issue:
There has been confusion regarding the implantation of bilateral external heart assist devices for temporary support, resulting in lack of data concerning these cases. A manufacturer, Abiomed, Inc. has requested that CMS clarify the coding for statistical purposes and patient follow-up

New Technology Application?
No

Food & Drug Administration (FDA) Approval:
The AB5000™ Circulatory Support System (AB5000) was approved by the FDA in 2003. The BVS® 5000 Biventricular Support System (BVS 5000) was approved by the FDA in 1993.

Background:
Heart assist devices provide temporary support for one or both sides of the native heart in circumstances where the heart has failed, potentially giving the patient's heart the opportunity to rest and possibly recover. Possible causes for the heart failure include acute cardiomyopathy, AMI, failed transplant, myocarditis, and post-cardiotomy shock.

Approximately 50 percent of the patients supported on external VADs require simultaneous support of both the right and left ventricles of the heart. Biventricular support is the preferred approach for patients who are likely to develop biventricular failure. Patients in need of biventricular support have higher survival rates if support is initiated for both ventricles at the same time, rather than sequentially. Better outcomes with biventricular support are most likely due to better end-organ function and sparing the patient from toxic inotropic medications that are frequently used to pharmacologically support the ventricle not receiving mechanical support.

Although it is preferable to initiate biventricular support concurrently, transient right-sided heart failure can occur following implantation of destination VADs and full but temporary support of the right ventricle may be needed. Often a temporary moderate-term device is used in combination with the implanted left-sided system to deliver support in these situations. The insertion of biventricular devices will increase operating room time. Post operative support has unique complex considerations differing from isolated left-sided support. Biventricular support while the native heart heals may require a lengthy period of hospital rest and recovery, averaging lengths of stay of 43 days for all AMI heart recovery patients.

Current Coding:
When ICD-9-CM does not provide a specific code distinguishing between insertion of one device and insertion of two of the same devices, the same code should be assigned twice to completely describe the procedure. Therefore, implantation of two external heart assist systems should be recorded in the medical record as 37.65 and 37.65. There is a

concern about whether or not the double coding has been performed in the hospital setting, leading to potentially incomplete data.

Temporary external heart assist systems should be coded to 37.65, Implant of external heart assist system. This code is to be used when the device is outside the body, but is connected to the heart with external circulation and pump. The code includes the open chest (sternotomy) procedure for cannulae attachments.

Coding Options:

Option 1:

Make no coding changes, as a code already exists for implantation of an external heart assist system. CMS will work with the industry to clarify coding convention so that hospital coders understand that if two devices are inserted, the code should be recorded twice.

Option 2:

Revise this section of the ICD-9-CM procedure codes to add clarity and specificity.

Revise subcategory title

37.6 Implantation of heart and circulatory assist system(s)

New code 37.60 Implantation or insertion of biventricular external heart assist system

Note: Device (outside the body but connected to heart) with external circulation pump. Ventriculotomy is included; do not code separately.

Temporary cardiac support for both left and right ventricles, inserted in the same operative episode

Includes:

open chest (sternotomy) procedure for cannulae attachments

Excludes:

implant of pulsation balloon (37.61)

implantation of internal biventricular heart replacement system (artificial heart) (37.52)

insertion of temporary non-implantable circulatory assist device (37.62)

insertion of percutaneous external heart assist device (37.68)

Revise code 37.64 Removal of external heart assist system(s) or device(s)

Add inclusion term explantation of single external device and cannulae

Add inclusion term explantation of external device(s) providing left and right ventricular support

Add excludes note Excludes: temporary non-implantable circulatory assist device (37.62)

Revise code — 37.65 Implant of single ventricular (extracorporeal) external heart assist system

Add note — Note: insertion or implantation of one external VAD for left or right heart support

Add inclusion term — insertion of one device into one ventricle

Excludes:

Add exclusion term — insertion or implantation of two external VADs for simultaneous right and left heart support (37.60)

Add exclusion term — insertion of implantable heart assist system (37.66)

37.66 Insertion of implantable heart assist system

Note: Device directly connected to the heart and implanted in the upper left quadrant of peritoneal cavity. This device can be used for either destination therapy (DT) or bridge-to-transplant (BTT).

Axial flow heart assist system
Diagonal pump heart assist system
Left ventricular assist device (LVAD)
Pulsatile heart assist system
Transportable, implantable heart assist system
Ventricular assist device (VAD) not otherwise specified

Excludes:

Revise note — implantation of ~~total~~ internal biventricular heart replacement system (artificial heart) (37.52)
implant of pulsation balloon (37.61)
insertion of percutaneous external heart assist device (37.68)

CMS Recommendation:
Adopt option 2 as outlined above.

Interim Coding:
Continue to use 37.65, Implant of external heart assist system. If more than one device is inserted during the same hospitalization, record the code twice.

Addenda

Tabular

Revise code title	37.62 Insertion of temporary non-implantable ~~heart~~ circulatory assist ~~system~~ device
Add note	Note: Includes explantation of this device; do not code separately.
Add includes note	Short-term circulatory support
	Excludes:
Revise excludes note	implantation of ~~total~~ internal biventricular heart replacement ~~heart~~ system [artificial heart] (37.52)
Add excludes note	removal of heart assist system (37.64)
Add excludes note	implant of external heart assist system (37.65)
Add excludes note	insertion of implantable heart assist system (37.66)

	38.99 Other puncture of vein
	Excludes: that for:
Revise exclusion term	angiography (88.60-~~88.69~~ 88.68)
Revise exclusion term	phlebography (88.60-~~88.69~~ 88.68)

	39 Other operations on vessels
Revise exclusion term	Excludes: those on coronary vessels (~~36.00~~ 36.03-36.99)

	44.32 Percutaneous [endoscopic] gastrojejunostomy
	Endoscopic conversion of gastrostomy to jejunostomy
Revise inclusion term	~~PEG~~ PEGJJ
Add exclusion term	Excludes: percutaneous (endoscopic) feeding jejunostomy (46.32)

	56.81 Lysis of intraluminal adhesions of ureter
Revise exclusion term	Excludes: lysis of periureteral adhesions (~~59.01 - 59.02~~) (59.02-59.03)
Revise exclusion term	ureterolysis (~~59.01 – 59.02~~) (59.02–59.03)

	77.8 Other partial ostectomy
	Excludes: excision of bone ends associated with:
Revise exclusion term	arthroplasty (81.31 – ~~81.87~~ 81.85)

Revise title	84.56 Insertion or replacement of (cement) spacer
Revise inclusion term	Insertion or replacement of joint (methylmethacrylate) spacer
	86.09 Other incision of skin and subcutaneous tissue
Add exclusion term	Excludes: that for drainage (86.04)
	87.41 Computerized axial tomography of thorax
Add inclusion term	C.A.T. scan of heart
	87.42 Other tomography of thorax
Add exclusion term	Excludes: C.A.T. scan of heart (87.41)
	88.38 Other computerized axial tomography C.A.T. scan NOS Excludes: C.A.T. scan of:
Add exclusion term	heart (87.41)
	91.6 Microscopic examination of specimen from skin and other integument
Revise exclusion term	Excludes: mucous membrane – code to organ site ~~that of operative wound~~
Revise exclusion term	that of operative wound (~~91.70~~ 91.71-91.79)
	97.14 Replacement of other device for musculoskeletal immobilization
Add inclusion term	Splinting
Add inclusion term	Strapping

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	Aneurysmectomy graft replacement abdominal
Revise subterm	aorta ~~38.44~~
Add subterm	open approach 38.44
Add subterm	endovascular approach 39.71

Add subterm — Zenith® Renu™ AAA graft 39.71

Angiography
Add subterm — by C.A.T. – *see* Scan, C.A.T., by site
Add subterm — by computed tomography – *see* Scan, C.A.T., by site

Add term — CentriMag® acute circulatory support device 37.62

Change – *see also* Replacement
Add subterm — splint 97.14

Conversion
Revise subterm — gastrostomy to jejunostomy (endoscopic) ~~44.32~~
Add subterm — for bypass 44.32
Add subterm — for feeding tube placement 46.32

Gastrojejunostomy (bypass) 44.39
with partial gastrectomy 43.7
laparoscopic 44.38
percutaneous (endoscopic) 44.32
Add subterm — for feeding tube placement 46.32

Add term — HeartMate® implantable heart assist system 37.66

Add term — HeartMate® II left ventricular assist system [LVAS] 37.66

Implant
Delete subterm — ~~half heart 37.62~~

Revise subterm — heart assist system~~, NEC 37.62~~
Add subterm — CentriMag® – *see* Insertion, circulatory support device
Add subterm — external heart assist device, percutaneous – *see* Insertion, circulatory support device
Revise subterm — external heart assist system, open approach 37.65
Add subterm — HeartMate® implantable heart assist system 37.66
Add subterm — HeartMate® II left ventricular assist system [LVAS] 37.66
Revise subterm — non-implantable ~~37.62~~ – *see* Insertion, circulatory support device

Revise subterm percutaneous external circulatory assist device – *see* Insertion, circulatory support device
Add subterm pulsation balloon 37.61
Revise subterm pVAD (percutaneous VAD) ~~37.68 –~~ *see* Insertion, circulatory support device
Add subterm TandemHeart® - *see* Insertion, circulatory support device
Add subterm temporary non-implantable circulatory assist device - *see* Insertion, circulatory support device
Add subterm that for destination therapy (DT) 37.66

Incision (and drainage)
abscess - *see also* Incision, by site
Add subterm antecubital fossa 86.04
Add subterm axilla 86.04
Add subterm cheek 86.04
Add subterm face 86.04
Add subterm gluteal 86.04
Add subterm groin region (abdominal wall) (inguinal) 54.0
Add subterm skin 86.04
Add subterm subcutaneous tissue 86.04
Add subterm hair follicle 86.04
Add subterm nailbed or nailfold 86.04
Add subterm neck 86.04
Add subterm paronychia 86.04
Add subterm perineum (female) 71.09
Add subterm male 86.04
Add subterm popliteal space 86.04
Add subterm skin 86.04
Add subterm subcutaneous tissue 86.04
Add subterm submaxillary 86.04
Add subterm supraclavicular fossa 86.04

Insertion
Add subterm circulatory support device
Add subterm CentriMag® 37.62
Add subterm external heart assist device
Add subterm percutaneous 37.68
Add subterm temporary 37.62
Add subterm non-implantable 37.62
Add subterm pVAD (percutaneous VAD) 37.68
Add subterm TandemHeart® 37.68
Add subterm temporary non-implantable circulatory assist device 37.62

Operation

Add subterm — Halsted Mastectomy 85.45

Replacement

Add subterm — spacer (cement) (joint) (methylmethacrylate) 84.56

Add subterm — splint 97.14

Scan, scanning

C.A.T. (computerized axial tomography) 88.38

Add subterm — cardiac 87.41

Add subterm — coronary 87.41

Add term — Thoratec® implantable ventricular assist device (IVAD™) 37.66

Add term — Thoratec® ventricular assist device (VAD) system 37.66

Tomography - *see also* Radiography

computerized axial NEC 88.38

Add subterm — cardiac 87.41

Add subterm — coronary 87.41

Add term — Vectra® vascular access graft 86.07