Clinic Scenario Workbook: 2018 CPT® Edition

JustCoding

Clinical Scenario Workbook: 2018 CPT® Edition

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Introduction

*JustCoding’s Clinical Scenario Workbook: 2018 CPT® Edition* contains 52 sample clinical cases to provide hands-on reinforcement of coding concepts. The cases range in difficulty, length, and medical specialty. They are designed to simulate real-life coding processes for training and assessing new coders or keeping skills sharp for experienced staff.

Each case includes provider documentation or operative reports based on real clinical scenarios. Cases offer a variety of documentation styles to reflect inconsistencies between different electronic health record systems and providers.

After reviewing the cases, coders should report the most applicable ICD-10-CM diagnosis codes and all relevant CPT procedure codes. Answer keys are included at the end of each chapter with the correct codes to report for each case. The answer keys were created by HCPro’s coding instructors and include:

- A list of reportable ICD-10-CM and CPT codes, as well as rationale for using those codes
- Applicable coding guidance, where appropriate, including references from the *ICD-10-CM Official Guidelines for Coding and Reporting*, the AHA’s *Coding Clinic, CPT Assistant*, and the *NCCI Manual*
- Instructions for looking up ICD-10-CM codes and certain CPT codes in the coding manuals
- Notation of which ICD-10-CM codes are assigned to hierarchical condition categories (HCC) to help familiarize coders with diagnoses that factor into risk adjustment

All codes and guidance are up to date as of January 1, 2018. The ICD-10-CM and CPT code sets as well as any guidance are subject to changes. These cases therefore should not be used as a guide for coding any real claims.
Cardiovascular System Scenarios
Provider documentation:

Preoperative diagnosis:

Abdominal aortic aneurysm (AAA)

Postoperative diagnosis:

AAA, right renal artery stenosis

Operation performed:

1. Endovascular repair of abdominal aortic aneurysm using fenestrated endograft system, Cook Z-Fen stent graft system
2. Reduction of a sliding inguinal hernia

3. Balloon angioplasty of right renal artery

**Anesthesia:**

General

**Complications:**

None

**Procedure:**

The patient was brought to the operative room. He underwent general anesthesia. The abdomen and lower extremities were prepped and draped in sterile fashion. Both femoral vessels were exposed through transverse bilateral inguinal incisions. There was a fairly large sliding hernia in the inguinal area with the hernia sac extending over the common femoral artery. Both femoral vessels were then exposed and circumferentially controlled proximally and distally. Both sides were then cannulated in retrograde fashion. There was a significant amount of tortuosity involving the iliac arteries.

We advanced a 6-French sheath on the left side, which was chosen as the contralateral side for delivery purposes. A Lunderquist stiff wire was advanced, allowing the iliac system to straighten out. At this time, we placed a 20-French Cook sheath in the left iliac system without difficulty. We proceeded to cannulate the hub of the 20-French sheath on the left side and successfully cannulated both renal arteries, placing a Rosen wire into the left renal artery without difficulty. There was stenosis at the origin of the right renal artery. This was cannulated and balloon angioplasty performed of the origin of the right renal artery using a 5 × 20 mm Viatrac balloon. In a similar fashion, Rosen wire was left in the right renal artery for marking purposes.

The main body of the device was chosen and had been designed using the patient’s CT scan. There were two small fenestrations for each renal vessel with a scallop for the superior mesenteric artery. The graft diameter was 30 mm and it was two main body stents. This was oriented and successfully advanced. The device was then deployed using aligning markers. We then cannulated the distal aspect of the proximal graft and were able to successfully cannulate each of the small renal fenestrations extending out into the renal vessels with Glidewires.
Case 1: Abdominal Aortic Aneurysm Repair

Six-French Ansel flex sheaths were then advanced into the origin of both renal arteries. ICast 6 × 22 stents were then advanced into the origin of both renal vessels. Two stent links were left in the main body of the device. At this time, each renal stent was successfully deployed. A 10 × 20 mm angioplasty balloon was then used to complete the deployment at the very proximal end and anchor the stent in place.

The distal body was chosen and advanced via the right iliac artery. This was advanced with approximately one stent extending distally and successfully deployed down to the contralateral gate. The contralateral gate was successfully cannulated from the left iliac artery. We then completed our left iliac deployment using a 74 × 20 mm iliac limb. At this time, on the ipsilateral right side, the final two stents of the distal body were deployed, and we completed the deployment of the right iliac system using a 56 × 20 mm iliac stent. The Coda balloon was used for the junction between the components. At this time, a completion angiogram was performed. The superior mesenteric artery was patent as were both renal stents and renal perfusion. We angioplastied just distal to the renal stent deployment.

At this time, sheaths and wires were withdrawn. The arteriotomies were closed using 5-0 Prolene suture. The large hernia on the right inguinal area was reduced, and we used a mesh Bard plug placed and secured it anteriorly with Prolene suture. Each inguinal wound was then irrigated and closed with 2-0 Vicryl, 3-0 Vircyl and 4-0 Monocryl subcuticular stitch. The patient was extubated in the operating room and transported to the recovery room in satisfactory condition. Total fluoroscopy time was 80.7 minutes. Total recorded Visipaque was 130 mL full strength.

Codes:

CPT:

ICD-10-CM:
Provider documentation:

Preoperative diagnosis:
Left carotid artery stenosis

Postoperative diagnosis:
Same

Operation performed:
Left carotid endarterectomy with bovine pericardial patch

Anesthesia:
General
Complications:

None

Procedure:

The patient was brought into the operating room. General endotracheal anesthesia was provided. The left neck was prepped and draped in a sterile fashion. We made an incision along the anterior border of the sternocleidomastoid muscle. Platysma was divided. Sternocleidomastoid muscle was retracted posterolaterally. The internal jugular vein and crossing branch including the facial vein was ligated with 2-0 silk suture. The common carotid artery was exposed. Dissection continued cephalad with exposure of both the internal and external carotid artery. There was a soft segment of the internal carotid artery without disease which was circumferentially controlled after the patient was systemically heparinized with 5000 units of intravenous heparin. The common carotid artery was also likewise circumferentially controlled as was the external and superior thyroid.

We clamped in sequence of internal followed by common, followed by external carotid artery. There were no immediate EEG changes. An arteriotomy was made in the common carotid, continuing into the internal carotid artery. Using a double-ended spatula, a good endpoint was achieved proximally and distally. The external carotid was cleared with an eversion technique. A bovine pericardial patch was sewn in place with a continuous running 6-0 Prolene suture. We reestablished flow to the external followed by the internal carotid artery. There were no significant EEG changes noted. We closed in a layered fashion using 2-0 Vicryl, 3-0 Vicryl and 4-0 Monocryl subcuticular stitch. The patient awoke in the operating room intact as she was preop and was transferred to the recovery room in satisfactory condition.

Codes:

CPT:

ICD-10-CM:
Case 2: Carotid Artery Stenosis

NOTES
Case 3: Chest Port Placement

Provider documentation:

Procedure:

Right chest port placement

History:

Needs chemotherapy

Patient age:

65
Medications:

This procedure was performed with conscious sedation and analgesia under my direct supervision. Versed and Fentanyl were administered. The time of the procedure was 60 minutes. One gram of Ancef was administered prior to the procedure.

Access:

Right internal jugular vein and right chest wall.

Guidance:

Ultrasound and fluoroscopy.

Consent:

Informed consent was obtained from the patient. All the risks, benefits and alternatives were explained, and all questions answered prior to the procedure.

Details of procedure:

Under direct ultrasonic guidance, the patent right internal jugular vein was accessed using a 5 French micro access system. A hard copy image of the ultrasound was recorded in our PACS. Under fluoroscopic guidance, a 0.035 guidewire was passed into the IVC. The skin overlying the right chest wall area was then anesthetized using 2% lidocaine with epinephrine. Using sharp as well as blunt dissection, a subcutaneous pocket was created overlying the right chest wall region. A 6.6 French single-lumen catheter was then tunneled subcutaneously from the subcutaneous pocket to the right internal jugular access site. The back end of the catheter was attached to a Med Comp Dignity power port, which was then placed in the pocket.

The 5 French micro access sheath was then replaced with a 7 French peel-away sheath. The intravascular portion of the catheter was calculated using fluoroscopic landmarks, and the catheter was cut to length. The catheter was inserted through the peel-away sheath such that its tip terminated within the proximal right atrium. The port was then flushed with heparin, demonstrating excellent function. The subcutaneous tissues were then closed using 3.0 Vicryl suture. The skin was then closed using Dermabond glue.

The patient tolerated the procedure well with no acute complications. The patient is to have a follow-up visit in our office to assess wound healing in approximately 48–72 hours.
Impression:

Successful placement of 6.6 French single lumen Med Comp Dignity power port placed via the right internal jugular vein terminating within the proximal right atrium. The chest port is ready to use and may be used for CT power injections as well.

Codes:

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ICD-10-CM:

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*Case study adapted from* Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.*
Case 4: Deep Vein Thrombosis

FIGURE 1.4 Insertion of intravascular vena cava filter

Provider documentation:

Indication:

A 66-year-old female presented with bilateral lower leg deep vein thrombosis at high risk for thromboembolic event.

Procedure:

Placement of IVC filter using ultrasound guidance and inferior vena cava filter placement.

Description of procedure:

Informed consent was obtained from the patient. The right neck was prepped and draped in the usual sterile fashion. The right internal jugular was identified ultrasonically and an image was captured. The vein was punctured under direct ultrasonic visualization. A guidewire was
advanced to the inferior vena cava and directed to the left iliac vein to document continuity. An inferior venacavaogram was performed.

The inferior vena cava is normal in appearance without evidence of thrombus or stricture. The level of the renal veins is marked. A Guenther-Tulip retrievable vena cava filter was then inserted below the level of the renal veins. Repeat venacavogram demonstrated good placement of the filter within the vena cava. The sheath was removed and hemostasis was achieved with manual compression.

A total of 1.7 minutes of fluoroscopy was used during this procedure.

**Impression:**

1. Normal-appearing vena cava.
2. Successful placement of a retrievable Guenther-Tulip IVC filter.

**Codes:**

**CPT:**

**ICD-10-CM:**
Provider documentation:

Procedure:

Informed consent was obtained. The left upper arm graft was steriley prepped and draped. After the administration of Lidocaine for local anesthesia, a 21-gauge micropuncture needle was used to puncture the mid portion of the graft under ultrasound guidance. The needle was exchanged over a 0.018-inch wire for a 4/3 coaxial dilator. Contrast was injected through a 4 French dilator with digital subtraction angiography over the left arm and chest. Reflux angiogram was also obtained. Images demonstrate that the graft is widely patent on its mid to central portions. The outflow is to above the basilic and cephalic veins with the graft connected to the left antecubital vein. Outflow is predominantly through the basilica vein. The left axillary and subclavian vein are widely patent. Brachiocephalic vein widely patent. Superior vena cava (SVC) is widely patent. Reflux angiogram demonstrates moderate stenosis at the level of the arterial anastomosis and proximal portion of the graft.

After the administration of Lidocaine for local anesthesia, a 21-gauge micropuncture needle was used to access the graft a second time with the needle pointed toward the arterial anastomosis under ultrasound guidance. The needle was obtained over a 0.018-inch wire for a 4/3 coaxial dilator which was then exchanged over a 0.035-inch wire for a 6 French sheath. The 5 French Berenstein catheter was advanced through the sheath and into the left brachial artery across the anastomosis with the aid of a Benson wire. Contrast was injected with DSA over the arterial anastomosis which demonstrated moderate multifocal stenosis at the level of the anastomosis. This was treated with a 6 mm × 4 cm Conquest balloon successfully with no significant residual stenosis identified on follow-up venogram.

The patient had significant thrill and good flow throughout the graft. The sheath was removed and hemostasis achieved with purse string suture. The patient tolerated the procedure well.
Moderate sedation was administered for 18 minutes with IV fentanyl and versed and monitoring by the nurse and radiologist during the procedure.

**Impression:**

Left forearm loop graft angiogram performed demonstrating moderate stenosis at the level of the arterial anastomosis. This was treated successfully with 6-mm Conquest balloon angioplasty.

**Codes:**

CPT:

ICD-10-CM:

Case study adapted from Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
Case 5: Dialysis Access

NOTES
**Provider documentation:**

**Preoperative diagnosis:**

- Large right popliteal artery aneurysm

**Postoperative diagnosis:**

- Same

**Operation performed:**

- In situ right femoral-peroneal artery bypass graft

**Anesthesia:**

- General

**Complications:**

- None

**Procedure:**

In the operating room, patient was placed under general anesthesia. The saphenous vein was marked out using an ultrasound transducer, Foley catheter placed, right leg prepped with ChloraPrep, and sterile drapes applied. Using a two-team approach, the longitudinal incision was made over the greater saphenous vein in the proximal calf on the knee and carried up to the above-knee popliteal space. The vein was of excellent caliber. In the above-knee popliteal space, the incision was deepened, the popliteal artery was dissected freely as well as dissection of the
peroneal artery. The proximal superficial femoral artery was dissected free. It was calcified distally but had a good soft proximal segment.

The saphenous vein was of good caliber. The patient was given 6000 units of heparin. The vein was freed up and ligated proximally and divided. The vein was then spatulated. The artery clamped proximally and distally; 15 mm arteriotomy made, end-to-side anastomosis performed with a running 6-0 Prolene suture at the femoral artery. Clamps released; there was good hemostasis and good flow in the graft. Distally the vein was ligated and divided. It was irrigated with heparin and saline and dilated up.

A LeMaitre valvutome now passed two times, cutting all of the valves, and there was excellent distal outflow. The distal anastomosis was then performed at the peroneal artery. After anastomosis, a dilator was passed distally to make sure the peroneal artery was patent beyond the one area that looked a little narrow below the level of the anastomosis. The incision was closed with running 3-0 Vicryl sutures, skin closed with clips, and dressing applied. Total blood loss about 400–500 mL. Patient was sent to the recovery room in satisfactory condition.

Codes:

CPT:

ICD-10-CM:
Provider documentation:

Preoperative diagnosis:

Large left internal iliac artery aneurysm

Postoperative diagnosis:

Same

Operation performed:

Coil embolization of left internal iliac artery aneurysm (combination of Cook and Amplatzer coils)

Anesthesia:

General

Complications:

None

Procedure:

The patient is brought to the operating room. His abdomen and groin were prepped in the standard surgical fashion. A 19-gauge introducer needle was used to access the right common femoral artery. Bright red blood, which was pulsatile, returned through the needle. Under fluoroscopic guidance, a Bentson wire was advanced into the aorta and an aortogram with runoff into bilateral iliofemoral vessels. A 4-French sheath was then placed over the wire and into the right common femoral artery. An Omni flush catheter was advanced over the wire to the level of the aortic
bifurcation. The wire was then advanced over the aortic bifurcation and into the left internal iliac artery aneurysm. The Omni flush catheter was then advanced over the wire into the internal iliac artery aneurysm, and an arteriogram was performed demonstrating the aneurysm and the two large branch vessels off of the aneurysm due to the division of the internal iliac artery.

The wire was then changed out for a Rosen wire and the Omni flush catheter was removed. The sheath was replaced with a 7-French Balkin sheath. A 6-French guide catheter was placed over the wire into the internal iliac aneurysm. The glidewire was placed through this and after a lot of manipulation, the larger of the two branch vessels was cannulated with the glidewire and a Bentzon catheter over the glidewire. At this point, the thought was that it would be difficult to cannulate the smaller branch of the internal iliac artery, which also needed to be coil embolized for complete outflow occlusion of the artery. Therefore, a series of catheter wire and sheath changes ensued which resulted in changing out the sheath for a longer 7-French destination sheath which could be advanced with its tip into the internal iliac artery aneurysm. The Rosen wire, which was advanced into the larger branch artery, was replaced with a .018 platinum plus wire. This was left in position and a buddy wire was then placed into the second smaller branch of the internal iliac artery aneurysm. The Berenstein catheter was placed over the glidewire into the second smaller branch of the internal iliac artery and four Cook 5 × 5 coils were placed into the smaller branch of the internal iliac artery.

The wire and the Berenstein catheter were then removed and the .018 wire was replaced with a Rosen wire through a Berenstein catheter exchange. The guide catheter was then replaced over the Rosen wire and advanced into the large branch of the internal iliac artery aneurysm. The Amplatzer coil, which was a 12 mm coil, was deployed in the proximal branch point of the internal iliac artery aneurysm with the proximal 1/3 of the coil plus extending into the aneurysm and 2/3 of the distal plug into the large branch. The aneurysm outflow was then almost completely coiled to ensure complete thrombosis of the aneurysm.

The decision was made to place a 22 Amplatzer coil in the aneurysm sac itself at the distal portion. The guide catheter was removed and through the 7 French destination sheath, the 22 mm coil was placed into the aneurysm sac.

The destination sheath was then withdrawn back into the common iliac artery on the right side and a right femoral arteriogram demonstrated that the percutaneous entry site was in the common femoral artery, and the common femoral artery appeared to be a good artery for the Angio-Seal closure. Attention was then turned to the left groin for Dr. B to proceed with the stent placement.
Provider documentation:

Preoperative diagnosis:

Large left internal iliac artery aneurysm

Postoperative diagnosis:

Same

Operation performed:

Stent graft of left iliac artery (AneuRx 20 × 55 and 16 × 115)

Anesthesia:

General

Complications:

None

Procedure:

In the operating room, the patient was placed under anesthesia. Both groins and the abdomen were prepped with DuraPrep and sterile drapes applied. This was a two-team approach: Dr. A on the right side and Dr. B on the left. Once the coils were in place, Dr. B explored the left common femoral artery through a longitudinal incision just below the groin crease. Dissection was carried out with cautery. The femoral artery was large. This was dissected free and a vessel loop passed around. Proximally, the vessel was controlled just above the circumflex iliac vessel with umbilical tape. The femoral artery was accessed with a 19-gauge needle and J-tipped
guidewire. An 11 sheath was placed. Bentzon wire was advanced up through the sheath and placed in the aorta.

A marker catheter was now advanced over the wire and positioned across the iliac artery. Hand injections were carried out showing that the left internal iliac artery was occluded. Patient was now heparinized with 4000 units of heparin. An AneuRx 16 × 16 × 115 stent graft was now chosen. The sheath was then removed. This was placed up over the wire and positioned in the left internal iliac artery. I felt there was a good overlap of the internal iliac artery orifice, although with deployment of this graft, it seemed to slip so that we did not have good coverage in the common iliac artery. It was only about a 1.5 cm overlap. The stent was opened up with the Reliant balloon. Hand injection through the sheath, however, showed some endoleak and insufficient proximal coverage. Therefore, a second stent graft was placed up over the wire. The second stent was an AneuRx 20 × 20 × 55 placed up over the wire.

There was about a 2 cm overlap with the existing stent graft, then carried up into the very proximal common iliac artery but staying below the aortic bifurcation. The aortic bifurcation was identified with a retrograde injection on the right side as well as placing an OmniFlush catheter up over the aortic bifurcation. The second stent graft was deployed proximally and in good position. A Reliant balloon was used to open it up. Hand injection through the sheath distally showed good positioning of the graft and there was no endoleak. Therefore, the sheath and guidewire were removed, the femoral artery clamped proximally and distally, and the arteriotomy closed transversely with a running 5-0 Prolene suture. The groin was closed in layers of 2-0 Vicryl. Skin closed with a running 4-0 Vicryl subcuticular suture and Angioseal placed on the right side. Patient tolerated the procedure well.

**Codes:**

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ICD-10-CM:
Case 7: Iliac Aneurysm Repair (Surgeon B)

NOTES

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Provider documentation:

Procedures performed:

1. Left heart catheterization.
2. Selective coronary angiogram.
3. Left ventriculogram.
4. Aortogram.
5. Selective vein graft injection as well as nonselective angiograms of the left internal mammary artery (LIMA).

Indications:

Ischemic heart disease, status post previous coronary artery bypass grafting, reported three vessels with continued chest discomfort and shortness of breath, abnormal stress test.

Hemodynamics:

The AO pressure 98/57, mean 74, LV pressure 100/10. LVEDP of 19.

Procedure:

He was prepped and draped in the usual sterile fashion, sedated in a stepwise fashion using Versed and Fentanyl. His right groin was locally anesthetized with Lidocaine. Utilizing the modified Seldinger technique, the right femoral artery was accessed and subsequently placed a 6-French sheath. Prefomed 6-French Judkin’s catheters were used to complete the left heart catheterization. Once the 6-French sheath was placed, the JL4 catheter was introduced under fluoroscopic guidance used to engage the left main coronary artery. After appropriate images were obtained, the catheter was exchanged for a JR4 catheter. This was used to selectively engage the right coronary artery as well as subsequent vein graft to the diagonal. The catheter
was then pulled back into the left subclavian with nonselective visualization of the LIMA which was not utilized for grafting. Ultimately this catheter was withdrawn and exchanged for a 6-French pigtail catheter, which was used across the aortic valve and performed left ventriculogram. Once this was done, the catheter was withdrawn into the ascending aorta and aortogram was then performed. This catheter was then removed. A sheathogram performed showing appropriate axis point for Angio-Seal closure deployment which did ensue without difficulty.

Findings:

Left main coronary artery arises from the left sinus of Valsalva bifurcates into the left anterior descending (LAD) and left circumflex. It has large epicardial vessel free of significant stenosis. The left anterior descending coronary artery is a large epicardial vessel, which terminates at the apex of the left ventricle giving rise to primarily two diagonal branches, the first of which bifurcates after a short segment. The second is a medium caliber vessel. Within the proximal to mid LAD, there is some nonobstructive disease visualized with potentially 60% stenosis. No high-grade lesions appreciable. There is a retrograde flow appreciated into the vein graft to the first diagonal branch. The left circumflex is a large epicardial vessel, which gives rise to two medium-to-large caliber obtuse marginal branches. The true left circumflex continues within the AV nodal groove and minimal disease at this point in time. There is no significant stenosis identified. I did not see any competitive flow present. The left circumflex is a nondominant vessel. The right coronary artery arises from the right sinus of Valsalva and is a large vessel anatomically dominant with diffuse nonobstructive disease within the proximal to mid distal segment 30% to 40%. No high-grade lesions appreciated.

No significant stenosis within the posterior descending and posterolateral branches. Saphenous vein graft from the aorta to the first diagonal widely patent with good distal runoff; however, again no high-grade stenosis appreciated within the native vessels. At the anastomosis site on the superior branch of the diagonal, there appears to be nonobstructive stenosis around 60% with good TIMI-3 flow noted distally.

Left ventriculogram:

Left ventriculogram showed preserved left ventricular systolic function, ejection fraction of 60% to 65% without segmental wall motion abnormalities. No significant valvulopathy.

Aortogram shows one identifiable graft previously subselective to the diagonal; as previously noted, the LIMA was not utilized, no evidence of LIMA graft present.
Impression:

1. Nonobstructive coronary atherosclerotic disease with one identifiable saphenous vein graft to the diagonal branch with some nonobstructive stenosis at the anastomosis, TIMI-3 flow noted distally.

2. Preserved left ventricular systolic function, ejection fraction greater than 65%.

3. No significant valvulopathy.

Recommendations:

Medical management. Given the results of the patient’s left heart catheterization, I have a low suspicion that his ongoing recurrent chest discomfort is cardiac in nature, possibly microvascular in nature, but less likely. He is having difficulty tolerating Imdur at this point in time. Thus, I will go ahead and discontinue his medications. Consider alternative causes to his discomfort mainly GI in nature or potentially musculoskeletal. He will be discharged with close interval follow-up.

Codes:

CPT:

ICD-10-CM:

Case study adapted from Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
Provider documentation:

Indication:

Patient with abdominal pain. The patient has CT demonstrating possible superior mesenteric artery (SMA) occlusion with celiac artery stenosis. The inferior mesenteric artery is patent on CT.

Procedure:

1. Retrograde puncture of the left common femoral artery.
2. Catheterization of the abdominal aorta.
3. Abdominal aortogram.
4. Lateral abdominal aortogram.
5. Selective catheterization of the celiac artery.
6. Celiac artery arteriogram.
7. Selective catheterization of the splenic artery with arteriogram.
8. Balloon angioplasty of the origin of the celiac artery.
9. Repeat arteriogram.
10. IV conscious sedation.

The patient was placed supine on the angiography table. The left groin was prepped and draped in normal sterile fashion. Puncture was made of the left common femoral artery with a 21-gauge micropuncture needle after adequate anesthesia was obtained with local administration of buffered Lidocaine. A 0.018-inch wire was advanced and a 4 French transition coaxial dilator was placed. A 0.035-inch wire was then inserted followed by insertion of a 5 French sheath.
The pigtail catheter was advanced into the suprarenal abdominal aorta and an abdominal aortogram was obtained in an AP projection. Abdominal aortogram demonstrates aneurysmal dilatation of the inferior abdominal aorta with more tortuosity and ectasia of this vessel. Maximal dimension was approximately 4.5 cm. Irregularity of the proximal iliac arteries is identified with a focal 60% stenosis of the right common iliac artery. The renal arteries appear widely patent. The celiac artery is patent. There is filling of distal superior mesenteric artery branches. The inferior mesenteric artery opacifies with contrast agent, though the origin is not well defined on this view.

Next, a lateral aortogram was obtained in inspiration and expiration confirming superior mesenteric artery proximal occlusion. There is high-grade ostial stenosis of the celiac artery with an element of median arcuate ligament compression, though the degree of severe stenosis did not significantly change with inspiration and expiration. Next, attempted cannulation was performed of the celiac artery using a variety of catheters. Eventually catheterization was obtained with a glidewire and a Simmons 1 catheter. The Simmons 1 catheter was then advanced and a celiac artery arteriogram was then performed in AP projection, demonstrating classical celiac branch anatomy with a prominent arc of Buehler reconstituting an occluded superior mesenteric artery proximally. Distally, the superior mesenteric artery opacifies with contrast agent. Next, a glidewire was advanced distally into the splenic artery followed by removal of the Simmons 1 catheter and advancement of a 5 French 60-cm slip catheter. The glidewire was removed and injection of contrast was performed within the slip catheter to obtain a splenic arteriogram which confirmed patency of this vessel without evidence of aneurysm or dissection. Next, the 0.035-inch Rosen wire was then inserted through the slip catheter and the slip catheter was removed. Next, the 5 French short sheath was removed and a 5 French Raabe sheath was inserted into the proximal celiac artery. Over the 0.035-inch wire, 5-4 angioplasty balloon catheter was then deployed across the ostial stenosis and inflated to 10 atmospheres of pressure. The balloon obtained full inflation with resolution of the waist seen upon insufflation. The balloon catheter was removed and repeat injection of contrast was performed demonstrating significant residual stenosis at the site, though improved from the pre-angioplasty study. At this point the procedure was terminated. Sheath, catheters and wires were removed. Hemostasis was obtained on the floor via FemoStop protocol.

Total fluoroscopy time was 26.9 minutes. The patient received a total of 99 mL Isovue 370. The patient received 400 mcg fentanyl IV and 3000 units heparin IV.
Conclusion:

High-grade ostial stenosis of the celiac artery, exacerbated by component of median arcuate ligament syndrome. This underwent balloon angioplasty to 5-4 with significant residual stenosis at the angioplasty site, though improved from the pre-angioplasty arteriogram. Occlusion of the proximal superior mesenteric artery with reconstitution via prominent arc of Buehler from the celiac artery. The inferior mesenteric artery appears patent distally, though the origin is not well defined on this exam.

Codes:

CPT:

ICD-10-CM:

Case study adapted from Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
FIGURE 1.5 Combined right heart catheterization and trans-septal left heart catheterization through septal opening

Provider documentation:

Procedures:

1. Right heart catheterization
2. 02 saturations
3. Trans-septal catheterization
4. Inferior vena cava (IVC) venography
5. Left heart catheterization
6. Coronary angiography
Indications:

Pre-operative evaluation/clearance for atrial-septal defect (ASD) repair.

Patient is a 53-year-old Caucasian male with a history of ASD repair at seven years old who has been experiencing shortness of breath along with hypoxia over the past several months. He also has a history of paroxysmal atrial fibrillation and has undergone ablation in the past and subsequently required implantation of a permanent pacemaker (DDD) for what appears to be sick sinus syndrome. He has no symptoms of angina but developed significant dyspnea on exertion while climbing three flights of stairs. Several months ago, he was hospitalized with pneumonia and has been dependent on supplemental oxygen (3.4 L/min) ever since. His best ambulatory oxygen saturation is in the high 80% despite being on supplemental oxygen. He recently underwent a transthoracic esophageal echocardiogram which suggested no evidence of significant shunt and with a Qp:Qs ratio of 0.9. However, injection of agitated saline demonstrated evidence of interatrial shunt.

Technique:

Arterial access site: Right radial artery
Arterial sheath size: 6F
Venous access site: Right antecubital vein
Largest venous sheath used: 6F

Right heart catheterization was performed with a 6F Swan Ganz catheter with measurement of pressures in the right atrium, right ventricle, pulmonary artery, and pulmonary capillary wedge positions.

Trans-septal catheterization was performed with an SF Swan Ganz catheter.

IVC venography was performed with a 4F Tennis racket catheter.

Left heart catheterization was performed with a 6F MP-A1 catheter with measurement of left ventricular and central aortic pressures.

Left and right coronary angiography in various right anterior and left anterior oblique projections was performed with 6F Jacky catheters with hand injections of contrast.
TR band was applied to right radial artery and manual compression was applied to right antecubital vein.

Fluoro time: 25.08 minutes Contrast: Omnipaque 160

Ventriculography remarks: Not performed. LVEDP is 11 mm Hg.

Coronary anatomy:

- Coronary dominance: Right
- Left main: 0%; This vessel has a normal caliber and course. No significant obstructive disease is noted.
- LAD: This vessel has a normal caliber and course. No significant obstructive disease is noted.
- Proximal LAD: 0%; Mid LAD: 0%; Distal LAD: 0%
- LCX: Co-dominant. This vessel has a normal caliber and course. No significant obstructive disease is noted.
- Circ: 0% proximal; OM: 0%; Ramus: 0 %
- RCA: Co-dominant. This vessel has a normal caliber and course. No significant obstructive disease is noted. RCA 0%; PDA: 0%; PL: 0%

Trans-septal catheterization:

For trans-septal catheterization, a Swan-Ganz catheter was advanced across the interatrial septum without difficulty. Presence in the left atrium and subsequently left ventricle was confirmed by analysis of blood saturation and measurement of pressures. Subsequently, right and left upper pulmonary vein oxygen sampling was performed.

IVC venography:

An IVC venogram of the distal (upper) IVC was performed using a tennis racket catheter with a power injector. A total of 60 cG of contrast was injected at 20 cG per second at 500 PSI. Imaging was performed in LAO projection. This study revealed brisk filling of the right atrium as well as the left atrium via a septal defect communication with the terminal IVC. This indicates
why the calculated Qp/Qs significantly underestimates the right to left shunt, as this shunting is caused by anatomic abnormality primarily and not because of pulmonary hypertension.

Post-procedure diagnosis:

- Persistent right to left shunt primarily through the terminal IVC into the left atrium. This is a remnant from the old surgical repair at age 7.
- Normal pulmonary pressures.
- Normal oxygen saturation on room air in supine position.
- Normal coronary arteries without any evidence of obstructive disease.

Codes:

CPT:

ICD-10-CM:

Case study adapted from Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
Case 11: Subclavian Artery Stenosis

Provider documentation:

Indication:

Patient with clinical findings of subclavian steal on the left. CT of neck confirmed high-grade stenosis of the subclavian artery. Carotid artery duplex demonstrated reversal of flow within the left vertebral artery.

Procedures performed:

1. Retrograde puncture of the right common femoral artery.
2. Catheterization of the thoracic arch.
3. Thoracic arch aortogram in LAO projection.
4. Selective catheterization of the left subclavian artery.
5. Left upper extremity angiogram.
6. Advancement of catheter into left brachial artery with additional views obtained of the left hand.
7. Stenting of high-grade proximal left subclavian artery stenosis.
8. Additional views obtained of the left subclavian artery.
9. IV conscious sedation.

Pre-procedure evaluation confirmed that the patient was an appropriate candidate for conscious sedation. Vital signs, pulse oximetry, and response to verbal commands were monitored and recorded by the nurse throughout the procedure and the recovery period. All medication for conscious sedation, including the doses administered, was placed in the medical record. The patient returned to baseline neurologic and physiologic status prior to leaving the department.
No immediate sedation-related complications were noted. Informed written consent was obtained from the patient after discussion of risks, benefits, and alternatives of the procedure. The patient expressed full understanding and agreed to proceed forward.

The patient was placed supine on the angiographic table. The right groin was prepped and draped in the normal sterile fashion. Puncture was made of the right common femoral artery in a retrograde fashion using a 21-gauge micropuncture needle. A 0.018 wire was advanced and a 4-French transitional coaxial dilator was placed. A 0.025 wire was advanced followed by placement of a 5-French pigtail catheter in the ascending aorta.

A steep thoracic arch aortogram was performed. The left common carotid artery and brachiocephalic artery share a common origin. The proximal aspect of the vessels appears unremarkable. The origin of the left subclavian artery is widely patent. There is a significant stenosis within the proximal left subclavian artery, as seen on CTA. There is retrograde flow through the left vertebral artery.

Next, the left subclavian artery was catheterized and a wire was advanced into the left subclavian artery distally. A catheter followed. A multistation left upper extremity arteriogram was performed. The origin of the left subclavian artery is patent. The high-grade stenosis was again identified. The origin of the left vertebral artery demonstrates moderate stenosis. The remainder of the left subclavian artery is unremarkable. The left axillary and brachial arteries are normal in appearance. The radial and ulnar arteries are normal in appearance. The inner osseous artery fills normally. The superficial and deep pulmonary arches opacify with contrast agent. The common digital branches opacify normally. There is poor filling of the lateral branch of the fifth proper digital branch as well as the lateral second proper digital branch.

Next, a 6-French sheath was advanced to the origin of the left subclavian artery. A dedicated angiogram was performed delineating the focal area of stenosis. A 7-29 balloon expander with stent was then deployed across the area of stenosis. The stent was fully deployed using eight atmospheres of pressure. A repeat injection of contrast to the sheath demonstrated an excellent result with resolution of the previously seen stenosis. The left vertebral artery now fills in antegrade fashion.

At this point, procedure was terminated. Sheath, catheters and lines were removed. Hemostasis was obtained with an Angio-Seal device. The patient tolerated the procedure well. There were no immediate complications.
Total fluoroscopy time was 7.5 minutes. The patient received 50 mL of Isovue-370 and 48 mL of Visipaque 320. The patient received 4 mg Versed, 150 mcg fentanyl, 3000 units heparin and 1 gram Ancef IV. The patient received 300 mg of Plavix p.o.

**Conclusion:**

High-grade proximal left subclavian artery stenosis corresponding to lesion seen on CTA. There was reversal of flow seen within the left vertebral artery. This lesion was successfully treated using a 7-mm balloon-expandable stent with an excellent result achieved. There is now antegrade flow within the left vertebral artery. The remainder of the subclavian artery as well as the axillary artery, brachial artery, and radial and ulnar arteries are normal in appearance. There is poor filling of the lateral branches of the proper digital arteries of digits two and five, which may be indicative of thromboembolism.

**Codes:**

**CPT:**

**ICD-10-CM:**

*Case study adapted from* Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
Case 12: Subclavian Vein Occlusion

Provider documentation:

History:

Right subclavian vein occlusion. History of left-sided breast cancer with a right-sided subclavian port. The patient is symptomatic with pain and swelling in her right arm.

Procedure:

1. Right basilic vein access with ultrasound and fluoroscopy
2. Subclavian venogram
3. Superior venacavogram
4. Angioplasty of the right subclavian vein and post angioplasty venography

The patient was brought to the procedure room and placed in a supine position and prepped and draped in a sterile fashion. Using ultrasound and fluoroscopic guidance, the right basilic vein was accessed with a micropuncture set. The micropuncture sheath was exchanged for a 5F vascular sheath over an 035 wire using routine interventional technique. Ultrasound guidance was used for vascular access. This included ultrasound evaluation of the right basilic vein, documentation of vessel patency, and real-time visualization of vascular needle entry into the right basilic vein. An image was permanently recorded. The right basilic vein was widely patent and was successfully accessed.

Using a 35 stiff Glidewire, an angled glide catheter was advanced to the axillary/subclavian junction and a subclavian venogram was performed. Using a stiff Glidewire and the glide catheter, it was impossible to cross the occlusion. When the catheter was in the superior vena cava (SVC), a superior vena cavagram was performed. The wire was then passed into the inferior vena cava for purchase and glide catheter was removed. The sheath was exchanged for a 6 French vascular sheath which was positioned in the axillary vein. The occlusion was
angioplastied using an 8 mm × 4 cm high-pressure balloon with prolonged insufflation. A post angioplasty venogram was performed. Repeat angioplasty was performed using a 10 mm × 4 cm high-pressure balloon with prolonged insufflation. A post-angioplasty venogram was performed. The wire and sheath were then removed and hemostasis achieved with manual compression. She was transferred to recovery in stable condition.

Findings:

Short segment occlusion right subclavian vein at the Mediport vein access site. Collateralization around the occlusion the neck collaterals and the external jugular vein. The SVC is patent. With the 8 mm balloon, a tight waist was seen which was able to be opened partially. Post-angioplasty venogram showed no extravasation and some flow through the subclavian vein. With a 10-mm balloon, a tight waist was seen which was able to be opened partially. Post-angioplasty venogram showed no extravasation and improved flow through the subclavian vein. There is a residual stenosis. This could not be opened with a 10-mm balloon. The native subclavian vein diameter was a little over 6 mm. Therefore, a 12-mm balloon was felt to be unsafe at this point.

Impression:

Successful angioplasty of the right subclavian occlusion with partial restoration of patency. There is a moderate residual stenosis remaining that did not respond to 10-mm angioplasty. A 12-mm angioplasty was felt to be unsafe. If the patient does not need her Mediport any longer for therapy, recommend removing the Mediport and its catheter. If the patient remains symptomatic after removal of the catheter, repeat venography and possible stenting could be considered.

Codes:

CPT:

ICD-10-CM:

Case study adapted from Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
Case 13: Undeveloped Primary Fistula in Left Forearm

Provider documentation:

History:

Left forearm primary fistula, which has failed to properly develop since its placement approximately 3–4 months ago. On physical examination, there is a strong pulse proximally, no thrill, and no flow was felt downstream of the anastomosis further than 4 cm.

Findings:

Procedure for a fistulagram was discussed with the patient and informed consent was obtained.

Following local skin preparation and anesthesia with Lidocaine, a 6 French sheath was placed near the arterial anastomosis in a downstream direction and contrast was injected showing a critical stenosis approximately 4 cm downstream of the anastomosis. Most of the contrast refluxes across the arterial anastomosis, which is widely patent. There is a moderate stenosis in the mid-portion of the radial artery. Flow is seen beyond the critical stenosis with a good size main draining vein and a large parasitizing vein. The parasitizing vein bifurcates soon after its origin.

Multiple attempts were then made with a Glidewire to cannulate the stenotic segment, but these proved unsuccessful. After multiple attempts were made, we noted no further flow through the stenotic segment, which had apparently been dissected. Subsequently, under ultrasound guidance, a second 6 French sheath was placed in the main draining vein in an upstream direction. With considerable difficulty, I manipulated a Glidewire and Mariner catheter across the stenotic segment. This was then angioplastied to 6 mm with a modest angiographic improvement, and then to 7 mm with a good angiographic improvement and marked improvement in the flow. A follow-up fistulagram showed excellent flow through the previously stenotic segment. A significant spasm was noted near the insertion site of the second sheath, and predominant flow was through the parasitizing collaterals.
Subsequently, a Berenstein catheter and Glidewire were used to selectively cannulate the parasitizing vein. The initial segment was quite short and subselective catheterization was made first in a downstream oriented parasite, which was then successfully embolized to 6 mm with a follow-up angiogram showing successful embolization. Then a cephalad oriented parasite was successfully cannulated and embolized with a 7-mm coil with good embolization. A follow-up angiogram showed excellent flow through the fistula. There was a strong thrill.

At the termination of the procedure, there was an excellent thrill. The catheter and sheath were withdrawn and hemostasis achieved with digital pressure and a purse string suture.

**Impression:**

Successful AV dialysis fistulagram with angioplasty of a critical stenosis in the main draining vein to 7 mm, embolization of two parasitizing veins. The draining veins up to the SVC are widely patent. There is a moderate stenosis in the mid-radial artery, which does not appear to be flow limiting and was not addressed at this time. Should only poor flow rates be achieved, this may need to be angioplastied at some point in the future.

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Case study adapted from Cracking the IR Code: Your Comprehensive Guide for Mastering Interventional Radiology by Stacie L. Buck, published by RadRx.
Case 13: Undeveloped Primary Fistula in Left Forearm

NOTES
 Answers for Case 1: Abdominal Aortic Aneurysm Repair

Codes and explanation:

CPT:

- 34847, endovascular repair of visceral aorta and infrarenal abdominal aorta with a fenestrated visceral aortic endograft and concomitant unibody or modular infrarenal aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including three visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])

- 34812-x 2 [-51], open femoral artery exposure for delivery of endovascular prosthesis, by groin incision, bilateral

- 49525 [-51], repair inguinal hernia, sliding, any age

Typical endovascular AAA grafts are tubular in shape because they are confined only to the aorta. For patients that have an aneurysm that extends below the renal arteries (possibly extending into the iliac arteries) it is imperative to have fenestrations or holes in the graft to accommodate the vessels that branch off the visceral aorta. Endovascular fenestrated AAA repairs of the visceral aorta (upper abdominal aorta containing the celiac, superior mesenteric and renal arteries) are complex procedures that involve the patient being seen in advance for high resolution cross sectional imaging (e.g., CT) and utilization of 3D software for modeling of the aorta. The graft is created as a patient-specific prosthesis based on the location and orientation of the patient’s renal and visceral artery origins.

CPT selection is based on the extent of the aorta treated. If the endoprosthesis is limited to only the visceral vessels (superior mesenteric, celiac and/or renal artery[s]), CPT codes 34842–34844 are assigned depending on the number of prostheses placed. However, if the device extends into the iliac arteries, then CPT codes 34845–34848 would be appropriate. These codes are also assigned based on the total number of visceral and/or renal arteries requiring placement of an endoprosthesis (i.e., bare metal or covered stent) through the aortic endograft fenestration.

In this operative report, the device involved the renal and the right iliac artery. There were a total of 3 vessels stented (endoprostheses) including the right/left renal arteries and the right iliac artery. The procedure code includes the balloon angioplasty of the target zone (where the grafts are being placed).
Codes 34841–34848 are used to report the placement of a fenestrated endovascular graft in the visceral aorta, either alone or in combination with the infrarenal aorta when performed for aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption. For reporting purposes, the following services are included in the work of codes 34841–34848 and therefore may not be reported separately:

- Balloon angioplasty within the target treatment zone of the endograft, either before or after endograft deployment;
- Fluoroscopic guidance and radiological supervision and interpretation in conjunction with fenestrated endovascular aortic repair that includes angiographic diagnostic imaging of the aorta and its branches prior to deployment of the fenestrated endovascular device, fluoroscopic guidance in the delivery of the fenestrated endovascular components, and intraprocedural arterial angiography (e.g., to confirm position, detect endoleak, evaluate runoff) done at the time of the endovascular aortic repair; and
- Introduction of guidewires and catheters in the aorta and visceral and/or renal arteries.

The open incision into both femoral arteries can be reported separately per the Fenestrated Endovascular Repair guidelines with CPT code 34812. CPT code 34812 is for unilateral procedures, but in the parenthetical notes, the AMA advises to report the CPT code 34812 twice when performed bilaterally.

The repair of the sliding inguinal hernia would be separately reported. Per the CPT guidelines, the use of mesh is not separately reported.

There are no NCCI edits prohibiting this combination of codes from being reported together; therefore, modifier -59 would not be necessary. However, some payers may require modifier -51 (multiple procedures) for the professional services claim to adjust for multiple procedure discount purposes.

**ICD-10-CM:**
- I71.4, abdominal aortic aneurysm, without rupture
- K40.90, unilateral inguinal hernia, without obstruction or gangrene, not specified as recurrent
- I70.1, atherosclerosis of renal artery
In the ICD-10-CM Alphabetic Index, reference, “Aneurysm, aortic, abdominal and Hernia, inguinal, unilateral (I71.4).” For the stenosis, main term is, “Stenosis, artery, renal (I70.1).”

The abdominal aortic aneurysm (I71.4) codes to an HCC for vascular disease. Atherosclerosis of renal artery codes to an HCC for vascular disease.
Answers for Case 2: Carotid Artery Stenosis

Codes and explanation:

CPT:

- 35301, thromboendarterectomy, including patch graft, if performed; carotid, vertebral, subclavian, by neck incision

The procedure can be referenced in the CPT Index under “endarterectomy,” which cross references “thromboendarterectomy, carotid.”

There is no indication in this operative report that this was a reoperation on the carotid arteries to support the add-on code 35390 (reoperation, carotid, thromboendarterectomy, more than one month after original operation).

A carotid endarterectomy is a surgical procedure to open or clean the carotid artery with the goal of stroke prevention. It is a durable procedure but not a cure. Though rare, blockage can accumulate again.

Common indications for the performance of a carotid endarterectomy are:

- A moderate (50–79%) blockage of a carotid artery. Patients are usually experiencing symptoms such as stroke, mini-stroke or TIA (transient ischemic attack).
- A severe (80% or more) blockage even if there are no symptoms.

The CPT code description for 35301 includes the placement of the bovine pericardial patch in the code description. The operative report must specify which artery was treated.

ICD-10-CM:

- I65.22, occlusion and/or stenosis of left carotid artery

In ICD-10-CM, look up “Stenosis, artery, precerebral,” which instructs the coder to “see Occlusion, artery, carotid.”

This condition may be assigned to an HCC for cerebrovascular disease.
Answers for Case 3: Chest Port Placement

Codes and explanation:

CPT:

- 36561, insertion of tunneled centrally inserted central venous access device, with subcutaneous port; age 5 years or older

- 77001, fluoroscopic guidance for central venous access device placement, replacement (catheter only or complete), or removal (includes fluoroscopic guidance for vascular access and catheter manipulation, any necessary contrast injections through access site or catheter with related venography radiologic supervision and interpretation, and radiographic documentation of final catheter position)

- 76937, ultrasound guidance for vascular access requiring ultrasound evaluation of potential access sites, documentation of selected vessel patency, concurrent real-time ultrasound visualization of vascular needle entry, with permanent recording and reporting

A tunneled centrally inserted catheter with a subcutaneous port was placed as described by code 36561. Code +77001 is assigned for documented fluoroscopic guidance with final catheter placement noted. Code +76937 is assigned for ultrasound guidance for vascular access with all documentation requirements for this code being met.

ICD-10-CM:

- Z45.2, encounter for adjustment and management of vascular catheters

In the ICD-10-CM Alphabetic Index, reference, “Fitting (and adjustment) of, portacath.” Ideally the malignancy being treated should be documented so that code may be reported as an additional code as the reason for the catheter placement.

Note: Conscous sedation was used, but documentation of time refers to total time. Report should reference intra-service sedation time. There were 60 minutes documented as total procedure time, but there were no specifics for intra-service sedation time. This would need to be clarified to assign moderate sedation codes 99152 and +99153 correctly.
Answers for Case 4: Deep Vein Thrombosis

Codes and explanation:

CPT:

- 37191, insertion of intravascular vena cava filter, endovascular approach including vascular access, vessel selection, and radiological supervision and interpretation, intra-procedural roadmapping, and imaging guidance (ultrasound and fluoroscopy), when performed.

The codes for intravascular vena cava filter procedures via an endovascular approach are distinguished by whether the procedure is an insertion, repositioning, or a retrieval.

Guidance from CPT Assistant, “Transcatheter Cardiovascular Procedures,” February 2013, provides coders with the rationale for code selection of insertion, repositioning or retrieval.

ICD-10-CM:

- I82.4Z3, acute embolism and thrombosis of unspecified deep veins of distal lower extremity, bilateral

In the ICD-10-CM Alphabetic Index, reference, “Thrombosis, vein, deep, lower leg.” Code I82.4Z3 is reported for the lower leg deep vein thrombosis. The documentation identifies the condition as bilateral.

Code I82.4Z3 may be assigned to an HCC for vascular disease.
Answers for Case 5: Dialysis Access

Codes and explanation:

CPT:

- 36902, introduction of needle(s) and/or catheter(s), dialysis circuit, with diagnostic angiography of the dialysis circuit, including all direct puncture(s) and catheter placement(s), injection(s) of contrast, all necessary imaging from the arterial anastomosis and adjacent artery through entire venous outflow including the inferior or superior vena cava, fluoroscopic guidance, radiological supervision and interpretation and image documentation and report; with transluminal balloon angioplasty, peripheral dialysis segment, including all imaging and radiological supervision and interpretation necessary to perform the angioplasty

- 99152, moderate sedation services provided by the same physician or other qualified healthcare professional performing the diagnostic or therapeutic service that the sedation supports, requiring the presence of an independent trained observer to assist in the monitoring of the patient’s level of consciousness and physiological status; initial 15 minutes of intraservice time, patient age 5 years or older

Code 36902 describes direct access into the AV graft for a fistulagram followed by angioplasty of the arterial anastomosis, which is considered part of the peripheral segment. Moderate sedation of 18 minutes is noted, allowing coders to report 99152.

ICD-10-CM:

- T82.858A, stenosis of other vascular prosthetic devices, implants and grafts, initial encounter

In the ICD-10-CM Alphabetic Index, reference, “Stenosis, due to presence of device, implant, or graft, catheter, dialysis (T82.858A).”

Code T82.858A is assigned to an HCC for complications of specified implanted device or graft.
**Answers for Case 6: Femoral-Peroneal Artery Bypass Graft**

**Codes and explanation:**

**CPT:**
- 35585, in-situ vein bypass; femoral-anterior tibial, posterior tibial, or peroneal artery

Bypasses in the arterial system can either be performed by autologous or synthetic options. For autologous (from the patient) grafts, include in situ grafts, meaning the vein remains in its bed, or a reversed vein graft, where the graft is harvested and then placed in a reversed fashion to bypass an artery. The reversal is necessary because veins and arteries have valves that run in opposite directions, so in order to use a piece of a vein to bypass an artery, it must be placed in a reversed fashion so the flow is in the right direction. Synthetic materials such as polytetrafluoroethylene (PTFE) or Dacron can also be used to serve as the conduit between the two arteries.

**ICD-10-CM:**
- I72.4, aneurysm of artery of lower extremity (popliteal)

In ICD-10-CM, reference main term “Aneurysm, popliteal.” An aneurysm is an excessive localized enlargement of an artery caused by a weakening of the artery wall.

This condition is considered an HCC for vascular disease.
Answers for Case 7: Iliac Aneurysm Repair (Surgeons A and B)

Codes and explanation:

CPT:

Surgeon A

- 37242, vascular embolization or occlusion, inclusive of all radiological supervision and interpretation, intraprocedural roadmapping and imaging guidance necessary to complete the intervention; arterial, other than hemorrhage or tumor (e.g., congenital or acquired arterial malformations, arteriovenous malformations, arteriovenous fistulas, aneurysms, pseudoaneurysms)

- G0269, placement of occlusive device into either a venous or arterial access site, postsurgical or interventional procedure (e.g., angioseal plug, vascular plug)

- 36246, selective catheter placement, arterial system; initial second order abdominal, pelvic, or lower extremity artery branch, within a vascular family

- 75630 (-26), aortography, abdominal plus bilateral iliofemoral lower extremity, catheter, by serialography, radiological supervision and interpretation

Surgeon B

- 34707, Endovascular repair of iliac artery by deployment of an ilio-iliac tube endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, and all endograft extension(s) proximally to the aortic bifurcation and distally to the iliac bifurcation, and treatment zone angioplasty/stenting, when performed, unilateral; for other than rupture (e.g., aneurysm, pseudoaneurysm, dissection, arteriovenous malformation)

- 34812, Open femoral artery exposure for delivery of endovascular prosthesis, by groin incision, unilateral

Per CPT Assistant, November 2013, the purpose of embolization is to block, reduce, or arrest blood flow to an area of the body with an endovascular abnormality (e.g., a tumor). An embolization procedure is a minimally invasive intravascular alternative to surgery. Embolization may be performed in various organs of the body for a wide variety of medical conditions including but not limited to arteriovenous malformations, peripheral vascular aneurysms, uterine fibroids,
kidney and liver lesions and neoplasms, gastrointestinal hemorrhage, scrotal varices, osseous neoplasms, dialysis shunts, and trauma of the spleen, liver, kidney, or pelvis.

CPT codes 37241–37244 were created to describe vascular embolization and occlusion procedures. Arteries, veins, and lymphatics may all be the target of this service. Once the vessel to be occluded is selected, the embolization material (e.g., coils, microscopic particles, plugs, or foam) is introduced to deliberately block the vessel, thus decreasing the blood flow to the tissues beyond the induced blockage. Images are then taken to ensure that the deployment and occlusion endpoint were successful.

When reporting embolization codes 37241–37244, code(s) for catheter placement(s) and diagnostic examinations may be separately reported using the appropriate diagnostic angiography codes with an appropriate modifier appended (e.g., modifier -59 [distinct procedural service]).

Per the CPT guidelines, intravascular stents both covered and uncovered are a class of devices that may be used as part of an embolization procedure. As such, there is a potential for overlap among codes used for placement of vascular stents and those used for embolization. When a stent is placed for the purpose of providing a latticework for deployment of embolization coils (such as embolization of an aneurysm) the embolization code is reported and not the stent code. In these operative reports, the coils were placed prior to the insertion of the AneuRx stent graft by the second surgeon, so the stent therefore was not used as the framework for the coils.

CPT code G0269 may be payer specific and is not recognized by all payers.

Code 34707 represents a procedure to report introduction, positioning, and deployment of an endograft for treatment of aneurysm, pseudoaneurysm, dissection or arteriovenous malformation of the iliac artery. All balloon angioplasty and/or stent deployments within the target treatment zone, which is defined as the portion of the iliac artery(ies) (e.g., common, internal, external iliacs) that contains the endograft either before or after endograft deployment, are included in the work of 34707 and are not separately reportable. Fluoroscopic guidance and radiological supervision and interpretation in conjunction with the endograft repair is not separately reported and includes all intraprocedural imaging (e.g., angiography, rotational CT) of the aorta and its branches prior to deployment of the endovascular components and intraprocedural and completion angiography (e.g., confirm position, detect endoleak, evaluate runoff) performed at the time of the endovascular iliac repair.
Open femoral or iliac artery exposure (e.g., 34812, 34820), introduction of guidewires and catheters (e.g., 36200, 36245–36248), and extensive repair or replacement of an artery (e.g., 35206–35286) should be additionally reported, per CPT Assistant, April 2012.

ICD-10-CM:
- I72.3, aneurysm of iliac artery

In the ICD-10-CM Alphabetic Index, reference, “Aneurysm, iliac.” Both surgeons would report this as the first-listed diagnosis code for this encounter.

This code is considered an HCC for vascular disease.
Answers for Case 8: Ischemic Heart Disease

Codes and explanation:

CPT:

- 93459 (-26), catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography

- +93567 (-26), injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for supravalvar aortography

Access was gained into an artery, indicating this was a left heart catheterization procedure. Code 93459 describes a left heart catheterization with imaging of the coronary arteries (coronary angiography), bypass grafts and left ventriculography. Imaging of the coronary arteries, bypass grafts and left ventricle is not coded separately. Supravalvular aortography was also performed with findings documented. This is reported with add-on code +93567.

Modifier -26 (professional component) would be appropriate if reporting for the professional component only.

ICD-10-CM:

- I25.10, atherosclerotic heart disease of native coronary artery without angina pectoris

- Z95.1, presence of aortocoronary bypass graft

In the ICD-10-CM Alphabetic Index, reference “Atherosclerosis,” which cross references to “Arteriosclerosis, coronary artery (I25.10).” There is no mention of angina pectoris in the documentation.

In the ICD-10-CM Alphabetic Index, reference “Status, aortocoronary bypass (Z95.1).”
Answers for Case 9: Possible Superior Mesenteric Artery Occlusion

Codes and explanation:

CPT:

- 36246, selective catheter placement, arterial system; initial second order abdominal, pelvic, or lower extremity artery branch, within a vascular family

- 75726-59, angiography, visceral, selective or supraselective (with or without flush aortogram), radiological supervision and interpretation

- 75774-59, angiography, selective, each additional vessel studied after basic examination, radiological supervision and interpretation

- 37246, transluminal balloon angioplasty (except lower extremity artery(ies) for occlusive disease, intracranial, coronary, pulmonary, or dialysis circuit), open or percutaneous, including all imaging and radiological supervision and interpretation necessary to perform the angioplasty within the same artery; initial artery

- G0269, placement of occlusive device into either a venous or arterial access site, postsurgical or interventional procedure (e.g., angioseal plug, vascular plug)

Access was gained at the left common femoral artery (36140) and the catheter was then advanced into the aorta (36200) for an abdominal aortogram. Next the catheter was selectively advanced into the celiac artery (36245), a first order vessel off the aorta. The catheter was then advanced into the splenic artery (36246), a second order vessel, for imaging. Remember, always code selective over non-selective catheterization from the same access site.

The most distal catheter placement was the splenic artery, and therefore 36246 is the only catheterization code assigned, because only one vascular family was catheterized. Referencing of vascular families and vessel orders can be found in the Appendix of the CPT Manual. Diagnostic angiography was performed of the aorta (75625); however, selective imaging of the celiac (75726) was performed following the aortogram. Code 75625 is bundled with 75726 and should not be reported separately. After imaging of the celiac, the catheter was advanced further into the splenic artery for imaging. Since the base imaging code 75726 has already been assigned for celiac imaging in this vascular family, code +75774 is assigned for the splenic artery imaging.
The physician performed an angioplasty of the stenosis in the celiac (37246). Code G0269 may be assigned for placement of a closure device in the hospital setting when not bundled with any of the CPT codes assigned.

Note: The report indicates IV conscious sedation, but the total time and required documentation is not in the report to select the correct code(s) 99152, +99153. Here are some examples of required documentation to report moderate sedation codes:

- The procedure was performed with conscious sedation and analgesia under my direct supervision. Continuous blood pressure, pulse oximetry as well as heart rate monitoring was performed by an independent registered nurse. Physician intra-service sedation time was 180 minutes.

- The patient was monitored with pulse oximetry, blood pressure cuff, and EKG leads by a registered nurse. IV conscious sedation was performed under my direction and supervision using 1 mg Versed and 50 mcg Fentanyl. Intra-service time: 30 minutes.

ICD-10-CM:
- I77.4, celiac artery compression syndrome
- K55.069, acute infarction of intestine, part and extent unspecified

In ICD-10-CM Alphabetic Index, reference, “Stenosis, artery, celiac (I77.4).” Additionally, the documentation mentions median arcuate ligament syndrome, which is also assigned to I77.4.

In ICD-10-CM Alphabetic Index, reference, “Oclusion, artery, mesenteric (K55.069).”

Code 177.4 is assigned to an HCC for vascular disease.

Codes for signs/symptoms (e.g., abdominal pain) should be not be reported separately when associated with a more definitive condition coded.
Answers for Case 10: Pre-Operative Evaluation for Heart Surgery

Codes and explanation:

CPT:

- 93533 (-26), combined right heart catheterization and trans-septal left heart catheterization through existing septal opening, with or without retrograde left heart catheterization, for congenital cardiac anomalies

- +93563, injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective coronary angiography during congenital heart catheterization

- 75825 (-26), venography, caval, inferior, with serialography, radiological supervision and interpretation

Access was gained into both the arterial system and the venous system, indicating this was a combined left and right heart catheterization procedure. Code 93533 describes a combined trans-septal heart catheterization for congenital heart defects. This code recognizes the professional and technical components, so modifier -26 (professional component) may need to be appended to identify when the provider is not reporting globally for the service (i.e., both professional and technical components).

Per the cardiac catheterization CPT guidelines, the typical cardiac catheterization procedures (CPT code 93452–93561) include the contrast injection(s) in the CPT code. However, for cardiac catheterizations performed for congenital heart disease, separate add-on CPT codes (93563–93568) can be reported separately when performed.

Coronary angiography is reported with CPT code +93563. The injection codes do not have professional/technical component designations; therefore modifier -26 or modifier -TC (technical component) is not necessary.

Additionally, per the guidelines for angiography of non-coronary arteries and veins, use appropriate codes from the radiology section. The study included venography of the inferior vena cava, which is not considered a coronary vein and should be reported with CPT code 75825.
Modifier -26 should be appended to the imaging code for the professional component only.

**ICD-10-CM:**

- Z01.810, encounter for preprocedural cardiovascular examination
- Q21.1, atrial septal defect
- Z95.0, presence of cardiac pacemaker
- Z99.81, dependence on supplemental oxygen

From the *ICD-10-CM Official Coding Guidelines*, Section IV.M:

*For patients receiving preoperative evaluations only, sequence first a code from subcategory Z01.81, Encounter for pre-procedural examinations, to describe the pre-op consultations. Assign a code for the condition to describe the reason for the surgery as an additional diagnosis. Code also any findings related to the pre-op evaluation.*

The co-existing status of a cardiac pacemaker and dependence on supplemental oxygen would likely be relevant to illustrate overall cardiopulmonary compromise.
Answers for Case 11: Subclavian Artery Stenosis

Codes and explanation:

CPT:

- 36221, non-selective catheter placement, thoracic aorta, with angiography of the extracranial carotid, vertebral, and/or intracranial vessels, unilateral or bilateral, and all associated radiological supervision and interpretation, includes angiography of the cervicocerebral arch, when performed

- 36215, selective catheter placement, arterial system; each first order thoracic or brachiocephalic branch, within a vascular family

- 37236, transcatheter placement of an intravascular stent(s) (except lower extremity artery(s) for occlusive disease, cervical carotid, extracranial vertebral or intrathoracic carotid, intracranial, or coronary), open or percutaneous, including radiological supervision and interpretation and including all angioplasty within the same vessel, when performed; initial artery

- 75710-59-LT, angiography, extremity, unilateral, radiological supervision and interpretation

Access was gained at the right common femoral artery (36140 bundled) and the catheter was advanced into the ascending aorta for an arch angiogram (36221). Diagnostic angiography was performed of the aortic arch from the injection of contrast at the aorta as noted under findings – origins of innominate, left common carotid and subclavian (36221). Code 36200 for catheterization of the aorta is bundled into code 36221.

The catheter was selectively advanced to the left subclavian artery, a first order vessel off of the aorta. The most distal catheter placement was the subclavian, and therefore code 36215 is assigned. Always code selective over non-selective from the same access site. Imaging of the left upper extremity was also performed (75710-59). Modifier -59 (distinct procedural service) is appended to 75710 to indicate that the diagnostic angiography meets criteria for reporting at the same session as the therapeutic intervention performed at the subclavian. Modifier -59 is also needed on 36215 so it will not bundle with 36221. The physician placed a stent across the area of stenosis in the subclavian artery (37236).
ICD-10-CM:

- I65.8, occlusion and stenosis of other precerebral artery (subclavian)

In the ICD-10-CM Alphabetic Index, reference, “Stenosis, artery, precerebral,” which cross references to “Occlusion, artery, precerebral.”

Code I65.8 is considered an HCC.

Note: The report indicates IV conscious sedation, but the total time and required documentation is not in the report to select the correct code(s) (99152, +99153).

Here are some examples of required documentation to report moderate sedation codes:

- The procedure was performed with conscious sedation and analgesia under my direct supervision. Continuous blood pressure, pulse oximetry as well as heart rate monitoring was performed by an independent registered nurse. Physician intra-service sedation time was 180 minutes.

- The patient was monitored with pulse oximetry, blood pressure cuff, and EKG leads by a registered nurse. IV conscious sedation was performed under my direction and supervision using 1 mg Versed and 50 mcg Fentanyl. Intra-service time: 30 minutes.
Answers for Case 12: Subclavian Vein Occlusion

Codes and explanation:

CPT:

- 37248, transluminal balloon angioplasty (except dialysis circuit), open or percutaneous, including all imaging and radiological supervision and interpretation necessary to perform the angioplasty within the same vein, initial vein
- 36010, introduction of catheter, superior or inferior vena cava
- 76937, ultrasound guidance for vascular access requiring ultrasound evaluation of potential access sites, documentation of selected vessel patency, concurrent real-time ultrasound visualization of vascular needle entry, with permanent recording and reporting
- 75820-59-RT, venography, extremity, unilateral, radiological supervision and interpretation
- 75827-59, venography, caval, superior, with serialography, radiological supervision and interpretation

Per the guidelines, the non-selective and/or selective catheterization can be reported separately. Ultrasound guidance was utilized and all required documentation is present to assign code +76937 for ultrasound guided vascular access of the right basilic vein (36005). The catheter was advanced into the axillary/subclavian junction for imaging (75820) followed by catheterization of the SVC (36010) where imaging was performed (75827). Report modifier -59 (distinct procedural service) with both imaging codes. Code 36005 for the access is dropped once the catheter is advanced into the SVC. The physician performed angioplasty of the subclavian vein (37248).

ICD-10-CM:

- I82.B11, acute embolism and thrombosis of right subclavian vein
- C50.912, malignant neoplasm of unspecified site of left female breast
- Z95.828, presence of other vascular implants and grafts
In the ICD-10-CM Alphabetic Index, reference, “Occlusion,” which cross references to “Thrombosis, vein, subclavian.” The default category is for an “acute” thrombosis unless documented as “chronic.”

Code I82.B11 is assigned to an HCC for vascular disease. Code C50.912 is assigned to an HCC for breast, prostate, and other tumors.
Answers for Case 13: Undeveloped Primary Fistula in Left Forearm

Codes and explanation:

CPT:

- 36902, introduction of needle(s) and/or catheter(s), dialysis circuit, with diagnostic angiography of the dialysis circuit, including all direct puncture(s) and catheter placement(s), injection(s) of contrast, all necessary imaging from the arterial anastomosis and adjacent artery through entire venous outflow including the inferior or superior vena cava, fluoroscopic guidance, radiological supervision and interpretation and image documentation and report; with transluminal balloon angioplasty, peripheral dialysis segment, including all imaging and radiological supervision and interpretation necessary to perform the angioplasty

- 36909, dialysis circuit permanent vascular embolization or occlusion (including main circuit or any accessory veins), endovascular, including all imaging and radiological supervision and interpretation necessary to complete the intervention

Code 36902 describes direct access into the AV fistula for a fistulagram followed by angioplasty of the main draining vein. Catheterization of the collateral (parasitizing) veins is bundled with code 36902. Embolization of these vessels is reported with +36909. The embolization code is reported only one time.

ICD-10-CM:

- T82.858A, stenosis of other vascular prosthetic devices, implants and grafts, initial encounter

In the ICD-10-CM Alphabetic Index, reference, “Stenosis, due to presence of device, implant, or graft, catheter, dialysis (T82.858A).”

Code T82.858A is assigned to an HCC for complications of specified implanted device or graft.
JustCoding’s Clinical Scenario Workbook: 2018 CPT® Edition provides an opportunity for coders to practice and refine their skills in a hands-on way by using a wide range of real-life case scenarios. In this book of 52 case scenarios, coders will determine the correct CPT and ICD-10-CM codes to report for each case scenario based on provided documentation, evidence of sufficient medical necessity, and any conditions present that would allow for Hierarchical Condition Category capture. The book also includes labeled illustrations for select cases to help coders by highlighting important anatomic details.

A full answer key with coding rationale for each case allows coders to self-audit and find immediate answers to their questions. When applicable, cases will also include references to guidance from CPT Assistant, Coding Clinic, the ICD-10 and CPT guidelines, and the NCCI Manual.