Overview

- General coding guidelines & documentation requirements
- Central venous access procedures
- Review of vascular interventions (angioplasty, atherectomy, stent placement, thrombectomy, embolization)
- Anatomy for fistulas and grafts
- Percutaneous fistula and graft diagnostic and interventional procedures
- Open surgical creation, thrombectomy and revision
- Combined open and percutaneous methods for revascularization

Change Adds to the Complexity

- Continuous changes in coding rules & regulations
  - CCI (Correct Coding Initiative) Edits, Pass Through Edits, MUEs (Medically Unlikely Edits) and necessity for appropriate modifiers (-59, -FB, -FC, -GY, -GZ etc.)
  - HCPCS Level 2 Codes
    - G0269 – Closure device placement
    - G0365 – Vessel mapping for hemodialysis evaluation
  - Category 3 Codes
    - 0237T – Atherectomy of brachiocephalic artery or branches

General Coding Standards

- Sources of Information:
  - Centers for Medicare and Medicaid Services (CMS)
    - National Coverage Determinations (NCDs)
    - Provider Policy Manual 19.0
  - Medicare Administrative Contractor (MACs) Local Coverage Determinations (LCDs)
  - American Medical Association (AMA), CPT 2013, CPT Assistant Articles and Archives, CPT Changes 2013, CPT Knowledge Base (online), American Hospital Association (AHA)
  - American Society of Diagnostic & Interventional Nephrology (ASDIN)
  - Society of Interventional Radiology (SIR)
  - American College of Radiology (ACR)
  - Society of Vascular Surgery (SVS)

General Recommendations for Physician Dictations

- State the history, medical necessity, reasons for repeat diagnostic study after prior catheter angiography/CTA/MRA
- State the vascular access site(s)
- State the vessels catheterized, describing the catheter tip location, and any variant anatomy
- State the vessels injected, the areas imaged (that are medically necessary), interpretation of findings, specific documentation of percentage stenosis, exact anatomic location of the lesions (central vs. peripheral) and description of any normal vessels in between the stenoses. Guiding vs. follow-up vs. diagnostic imaging
- State the interventions and adjunctive procedures performed. Also any complications or additional treatments provided
- State the specific devices and specialty supplies used during the procedure
Central Catheters

- New Centrally Inserted Catheter
  - 36555 Non tunneled under 5
  - 36556 Non tunneled 5+
  - 36557 Tunneled without port or pump under 5
  - 36558 Tunneled without port or pump 5+
  - 36565 Tunneled with 2 catheters without port or pump (Tesio type)
  - 36566 Tunneled with 2 catheters with port or pump (Lifesite type)

- Repair Central or Peripherally Inserted
  - 36575 Tunneled or non-tunneled without port or pump
  - 36576 Tunneled or non-tunneled with port or pump
  - Code twice for twin devices when both catheters are repaired

- Complete Replacement Through Same Access Site
  - 36580 Non-tunneled centrally inserted without port or pump
  - 36581 Tunneled centrally inserted without port or pump
  - Code new tunneled placement when permanent catheter is replaced over a wire and the non-tunneled catheter is removed

- Removal of Device
  - 36589 Tunneled without port or pump
  - 36590 Tunneled with port or pump
  - Code twice when both portions of twin devices are removed

- Mechanical Removal of Obstructive Material
  - 36595 – Via separate access
  - 36596 – Through device lumen
  - 75901 – Via separate access S&I
  - 75902 – Through device lumen S&I
  - Fibrin sheathoplasty, use 36595 and 75901. (Physicians add -52 modifier). If a true underlying stenosis of the vein exists, it must be documented, then use 35476 and 75978.
  - Do not use CPT 36598 with either CPT 36595 or 36596.
Repositioning of CVC
- 36597 – Repositioning under fluoro guidance
- 76000 – Fluoro guidance
- 3 ways to reposition a central venous catheter:
  - Wire manipulation
  - TB syringe flush
  - Snare (add catheter placement code)
- Do not code repositioning of a catheter at the same time as catheter stripping when the catheter is snared and stripped and at the end of the procedure the catheter is repositioned into the SVC or RA. Just bill the catheter stripping procedure with codes 36595, 75901 and 36010/36011

Snare – a device used to grab and remove an object, such as a fractured catheter from the heart. For retrieval of intravascular foreign body.

Intravascular Foreign Body Retrieval
- 37197
- Catheter placement code (i.e., 36010)
- Code 37197 includes both surgical and S&I
- Do not use 37197 for removal of IVC filter. Use code 37193
- Do not use for snaring of fibrin sheath. Use 36595, 75901 and catheter placement

Central Venous Catheter Guidance
- 77001 - Fluoroscopic guidance for placement, replacement, or removal of CVC; S&I includes:
  - Evaluation of potential access sites
  - Documentation of selected vessel patency
  - Realtime US visualization of vascular needle entry
  - Documentation of permanent recording and reporting

Central Venous Catheter Guidance
- 76937 – Ultrasound guidance for placement or replacement S&I; must include these:
  - Evaluation of potential access sites
  - Documentation of selected vessel patency
  - Realtime US visualization of vascular needle entry
  - Documentation of permanent recording and reporting

Central Catheter Checks
- Fluoro with contrast, no vein described (“Fibrin sheathogram”) – 36598, includes fluoroscopy, images and report. Do not use 76000 with this code.
- Superior vena cavagram – 75827
- Extremity venography – 75820
- No injection code is used for these procedures other than extremity venography
Catheter De-Clot with Thrombolysis

- 36593 (TPA dwell)
- Can be reported twice in the same day if done at completely separate settings
- Used with injection of TPA or infusion by protocol (e.g., 1mg TPA/hr. x 4 hours)

Angioplasty

- Angioplasty is coded per vessel treated (except the femoral/popliteal territory), not per stenosis.
- Do not need to be successful to charge for angioplasty
- CAN code for angioplasty and separate stent in the same site/vessel in the brachiopheliac arteries, visceral, and renal arteries and in veins (use bundled codes 37220-37235 for lower extremity arterial revascularization)
  - If intent is to perform a successful angioplasty with an adequately sized balloon, however there is a vessel rupture (veins), 30% residual stenosis (recoil, residual), 5mm residual systolic arterial gradient, flow-limiting dissection or acute occlusion, then both may be coded as these are indications for coding both PTA and stent placement. (This does NOT apply to lower extremity, carotid, vertebral or coronary arteries).
  - Anticipate bundling changes for stent placements in CPT 2014.

Angioplasty and Venoplasty

- Do not code “pre-dilation” angioplasty prior to stent placement.
- Do not code “post-stent deployment angioplasty to fully dilate or deploy the stent or for “residual stenosis” in the self-deploying stent.
- Do not code angioplasty when the intent was to stent the vessel from the start.
- Do not code angioplasty, when the angioplasty gives a great result, but we stented the vessel anyways.
- Do not code angioplasty when the original balloon is too small to give a good result to start with and stent is then “required”.
- Do not code multiple angioplasties in a single vessel.
- Do not code two angioplasties when treating a short bridging lesion across two adjacent vessels.
- Do not code angioplasty when macerating clot, this is part of a thrombectomy procedure.
- Do not code angioplasty when done with atherectomy or stent placement in the lower extremities.

Atherectomy

- Utilizes rotational burrs, directional cutting devices, photo ablation (laser) and pulverization to remove atheromatous plaque from the vessel
- Eximer Laser, EV3 Silver Hawk, Diamondback Orbital Atherectomy Device, Rotablator, Cresser, Jetstream G3, etc.
- Percutaneous or Open, including S&I for procedure
  - Supra-Inguinal
    - 0237T – Brachiocephalic trunk or branches
    - 0238T – Iliac artery
  - 37799 – Venous (Diamondback Orbital Device only)
  - Infra-Inguinal
    - 37225 – femoral/popliteal, includes angioplasty

Surgical codes based on approach

- **Arterial** – Use for arterial stenosis of arterial anastomosis or of native artery
  - 35475 – Percutaneous brachiophelial artery and branches
  - 35458 – Open brachiophelial artery and branches
  - 75962/75964 – S & I for extremity angioplasty
  - 37220 – Iliac artery angioplasty
  - 37224 – Femoral artery angioplasty
- **Venous** – Use for venous stenosis in extremity veins, central veins and portal veins
  - 35476 – Percutaneous
  - 35460 – Open
  - 75978 – S & I for venoplasty
Atherectomy – percutaneous removal of atheromatous material

Jetstream G3  Crossover Recanalization System

Diamondback  Excimer Laser  Rotablator  Silverhawk

Supra-Inguinal Atherectomy Rules
- Bill separately in addition to “T” atherectomy codes:
  - Catheter placement
  - Diagnostic angiography
  - Angioplasty and/or Stent placement to treat the same or different lesion in the same or in different vessels
  - Closure device placement
- Atherectomy is per vessel treated, not per stenosis.
- If multiple stenoses in multiple Supra-inguinal vessels are treated with atherectomy, use the same atherectomy T-codes multiple times as needed for the additional vessels treated (e.g., use 0238T up to 3 times in unilateral iliac territory for common, internal and external atherectomy). Use 0237T once for the arterial anastomosis of an upper extremity AV shunt.

Infra-Inguinal Atherectomy Rules
- The following are bundled with atherectomy below inguinal ligament:
  - Vascular access, catheter placement, work to cross the lesion & angioplasty in the same vessel.
  - Imaging related to the procedure along with follow-up imaging. Use of EPD.
  - Other interventions to treat the same or other vessels may require different codes (stent placement bundles atherectomy, atherectomy bundles angioplasty in same vessel).
  - Vessel closure with sutures, device placement or pressure.

Non-Carotid/Vertebral/Lower Extremity Stent Placement Rules
- There is one S&I code
  - 75960 – Transcatheter introduction of stent percutaneous or open, not coronary, vertebral, carotid, cerebral or lower extremity artery, S&I
- The surgical procedure codes are more specific
  - Percutaneous
    - 37205 – stent placement initial vessel
    - 37206 – stent placement each additional vessel
  - Open
    - 37207 – stent placement initial vessel
    - 37208 – stent placement each additional vessel

Self-Expanding Stents – Absolute, Lifesent, Protégé, Smartstent, Wallstent, Zilver, Epic
Non-Carotid/Vertebral/Lower Extremity Stent Placement Rules

- Bill per vessel treated (not per lesion).
- Use 75960 multiple times on multiple vessel stent procedures.
- Bill separately for
  - catheter placement
  - diagnostic angiography (must meet medical necessity)
- Do not bill separately for a “guiding” or follow-up angiogram.

Angioplasty is billable when:
- Performed initially as a primary angioplasty, but with a sub-optimal result (i.e., elastic recoil with 20-30% residual stenosis, flow-limiting dissection, 5mm residual systolic pullback gradient or acute occlusion)
- Performed to treat an area of the vessel not treated with the stent
- Performed to treat a dissection or stent-induced stenosis (i.e., plaque movement)
- Only applies to renal, visceral and brachiocephalic arteries and venous structures

Vascular access, catheter placement, work to cross the lesion is bundled.

Atherectomy and angioplasty in the same vessel is included in the stent with atherectomy or stent placement codes respectively.

Other interventions to treat the same or other vessels may require different codes (atherectomy supersedes stent placement. Both of these include angioplasty if performed).

S&I related to the procedure along with follow-up imaging is included. Use of embolic protection device is included.

Closure device placement is bundled.

Lower Extremity Stent Placement Codes

- 37221 – Iliac stent, initial vessel
- 37223 – Iliac stent, each additional vessel
- 37226 – Femoral/popliteal stent, includes angioplasty if done
- 37727 – Femoral/popliteal stent, with atherectomy, includes angioplasty if done
- 37230 – Tibial/peroneal stent, initial vessel, includes angioplasty if done
- 37231 – Tibial/peroneal stent, with atherectomy, initial vessel, includes angioplasty if done
- 37234 – Tibial/peroneal stent, each additional vessel, includes angioplasty if done
- 37235 – Tibial/peroneal stent, with atherectomy, each additional vessel, includes angioplasty if done

Percutaneous Thrombectomy

- 37184 – Primary arterial mechanical thrombectomy. Includes intraprocedural thrombolytics and guidance
- 37185 – Second and all subsequent vessels in the same vascular family (add-on code)
- 37186 – Secondary arterial thrombectomy, at time of another intervention (small emboli or short segment of clot either before or after another percutaneous intervention, such as angioplasty or stent)

These interventions do not include catheter placement, diagnostic imaging, angioplasty/stent or other interventions, thrombolysis before or after the thrombectomy.

If intent is to perform thrombectomy and an underlying stenosis is found and treated, BOTH the thrombectomy and stenosis treatment are billable and the thrombectomy is considered a PRIMARY thrombectomy
Percutaneous Thrombectomy

- 37187 – Venous thrombectomy includes intraprocedural thrombolytics
- 37188 – Venous thrombectomy, repeat treatment on subsequent day during course of thrombolytic therapy.
  - Venous interventions do not include catheter placement, diagnostic imaging, angioplasty/stent or other interventions, thrombolysis before or after the thrombectomy
  - Mechanical thrombectomy means removal of thrombus by use of a device. This includes the Treortola and Angiojet catheters (among many others), suction removal of clot with a sheath or catheter, angioplasty balloon maceration of the thrombus and removal or displacement of the thrombus with a Fogarty or similar catheter.
- 36870 – Percutaneous dialysis graft thrombectomy (by any method)
- 92973 – Percutaneous coronary artery thrombectomy (only with AngioJet device currently)

Embolization

- Peripheral
  - 37204, 75894 (can be used for embolization of AV fistula branches in a non-maturing fistula
  - Code once per surgical site (NOT per coil or vessel treated)
  - Add selective catheter placement codes
  - Add diagnostic imaging performed
  - Follow up angiography – 75898 (use 75898 only once per surgical site for completion study)
Surgically Created Arteriovenous Anastomoses and Shunts

Arteriovenous (AV) Shunt

Thrombosed AV Shunt with Cross Catheter Sheath Placement
Residual Thrombus and Underlying Stenoses after Percutaneous Thrombectomy Utilizing Thrombolysis, Thrombectomy and Fogarty Balloon

Arterial plug:
a platelet plug is removed during a dialysis declot procedure. This is at the arterial anastomosis of an AV shunt, usually w/ a Fogarty

Dialysis Graft Procedures

Diagnostic Shuntogram
- 75791 - S&I

- Includes immediate injections of contrast and all necessary imaging from the arterial anastomosis and adjacent artery through entire venous outflow including the IVC or SVC. This code is only used for evaluation via an already existing access into the shunt or from an access that is not a direct puncture of the shunt (unless an embolization with selective venous catheterization performed.) Code the remote catheter placement separately.
**Dialysis Graft Procedures**

**Initial Access Site with Imaging**
- 36147 – Includes initial catheter placement into the AV shunt/fistula, injection of contrast and all necessary imaging of the arterial inflow, shunt and venous outflow up to the right atrium. This is an all inclusive code and does not have an S&I. Do not bill with 75791. This code includes advancing the catheter into the SVC or across the arterial anastomosis into the native artery for inflow evaluation.

**Dialysis Graft Procedures**

**Multiple Access Sites**
- 36148 – additional access into AV fistula for therapeutic intervention (add-on code to 36147)
- 36011 or 36012 – selective venous branch catheter placements (e.g., for embolization of collaterals). With these codes you delete one of the “access” codes 36147 or 36148.
- 36215 – selective upper extremity arterial branch selection if catheter moved centrally in native arterial circulation for intervention (e.g., subclavian artery angioplasty, or down the arm for hand thrombectomy of arterial emboli. Not for crossing the arterial anastomosis for routine imaging of inflow. If the catheter reaches the aorta, keep 36215, NOT 36200). This is in addition to 36147.
- 76937 – can be used, particularly with aneurysms,stenoses, occlusions, etc

**Venoplasty**
- 35476, 75978 – initial vessel (in the peripheral or central territory)
- 35476-59, 75978-59 – if additional vessel (in the other territory)
- Balloon dilation throughout the graft and peripheral veins (including arterial anastomosis, arterial and venous limbs, venous anastomosis of the graft and the entire upper extremity venous outflow up to and including the axillary vein), is considered one angioplasty for coding purposes. There are now 2 separately billable zones for intervention; the graft and peripheral veins (peripheral zone) and the central veins including the SVC, subclavian and brachiocephalic veins
- Use appropriate arterial angioplasty code (e.g. 35475) and venous angioplasty code 35476 for balloon procedures performed for dialysis access interventions. Only use one “plasty” code once for all angioplasty procedures from the arterial anastomosis up to and including the axillary vein. Use 35475 preferentially over 35476 if both done in same zone.

**Angioplasty of Arterial Inflow (or Anastomosis)**
- 35475/75962 (brachiocephalic), 37220 (iliac) or 37224 (femoral).
- Do not code for both arterial and venous anastomosis angioplasty. The entire graft, both anastomoses and the venous outflow in the extremity to the level of the axilla is considered part of the same vessel. Only one procedure may be coded in this anatomic region. The native artery away from the arterial anastomosis is considered separately, however a “peri-juxta anastomotic region stenosis = the arterial anastomosis…..and is NOT a separately billable lesion.
- If arm arterial anastomosis only is balloonled, use 35475/75962
- If both the arterial anastomosis and a peripheral zone venous stenosis is also dilated in an upper extremity shunt, only bill the arterial procedure with 35475/75962.

**Percutaneous declot of Graft (any method)**
- 36870 – includes
  - Fogarty catheter
  - thrombectomy catheters
  - thrombolytic therapy (including lyse and wait technique or longer infusions of the graft)
  - thrombolytic brush
  - balloon maceration
  - pull-thru and push-thru
Dialysis Graft Procedures

- Use of 37212 for prolonged catheter directed venous thrombolytic infusion of a separate central venous thrombosis unrelated to the AV graft declot procedure (unusual)
- AV graft atherectomy – 37799 or use appropriate vessel specific arterial code for arterial anastomosis. Only FDA approved device is the Diamondback Orbital atherectomy device

Dialysis Intervention Case 1:
Patient with poor flow in his AV graft. The venous limb of the graft is punctured. A shuntogram shows a 90% stenosis at the venous anastomosis. After 6mm venoplasty for 60 seconds, follow up venography shows 70% residual stenosis due to recoil. An 8mm self deployable stent is placed.

- 36147 – Puncture with imaging of shunt
- 35476 – Venoplasty of venous anastomosis
- 75978 – S&I venoplasty
- 37205 – Stent placement at residual stenosis site
- 75960 – S&I stent placement

Dialysis Intervention Case 2:
Patient with thrombosed AV graft. Both the arterial and venous limbs of the graft are punctured. 2mg TPA lyse and wait is performed. A shuntogram shows a 90% stenosis at the venous anastomosis with some residual clot. After 6mm venoplasty for 60 seconds, follow up venography shows excellent result. Residual clot is pushed centrally with a Fogarty catheter.

- 36147 – Puncture with imaging of shunt
- 36148 – Additional puncture of shunt
- 36870 – AV graft thrombectomy with lyse and wait technique and Fogarty clearance of thrombus
- 35476 – Venoplasty of venous anastomosis
- 75978 – S&I venoplasty

Dialysis Intervention Case 3:
Patient with poor flow in his AV fistula. The venous outflow vein is punctured. A fistulagram shows two large branches diverting flow and a venous stenosis in the cephalic vein at the insertion into the subclavian vein. A separate brachiocphalic (innominate) venous stenosis is treated with a 12mm angioplasty, rupture resulted, and treated with a stent. Cephalic venoplasty with 6mm balloon venoplasty is performed. Coil embolization of both branches is performed w/ post embolization follow-up imaging.

- 75791 – Imaging shunt
- 35476 – Venoplasty innominate vein
- 75978 – Venoplasty, S&I
- 35476-59 – Venoplasty cephalic vein
- 75978-59 – Venoplasty S&I
- 37205/75960 – Stent placement
- 36011 – Catheter placement
- 36011-59 – Catheter placement
- 37204 – Embolization of branch
- 75894 – Embolization S&I
- 75898 – Follow up angiography

Dialysis Intervention Case 4:
Patient with history of clotted arm graft
Arterial limb puncture of graft with 2mg lyse and wait, followed by venous puncture of the graft, followed by shuntogram and venography of the arm and central veins. This showed a 95% stenosis of the venous anastomosis extending into the outflow vein for 6cm. Venoplasty with cutting balloon was performed. A Fogarty balloon was used to pull the plug and the residual clot was pushed into the superior vena cava. Repeat study shows slow flow into the patent arterial anastomosis. To fully evaluate the cause of thrombosis of the graft and slow inflow, the catheter is advanced across the arterial anastomosis into the native brachial artery and advanced centrally into the thoracic aorta. Imaging of the entire upper extremity arterial inflow is performed. 90% mid axillary stenosis is identified and treated with 5mm balloon angioplasty successfully.

- 75791 – Imaging shunt
- 37205/75960 – Stent placement
- 36011 – Catheter placement
- 75894 – Embolization S&I
- 75898 – Follow up angiography
**Dialysis Intervention Case 4 Codes:**

- 36870
- 36147
- 36148
- 35476-59
- 75978-59

**Dialysis Intervention Case 4:**

Patient with left thigh AV graft thrombosis. Percutaneous catheter placements into the arterial and venous limbs are performed followed by imaging of the immediate arterial inflow, the graft, iliac veins and cava. Partial thrombosis of the graft is seen. Balloon maceration of thrombus along with use of the Fogarty balloon results in resolution of thrombus, but an underlying 80% stenosis of the venous anastomosis is seen. This is treated successfully by prolonged 6mm high pressure balloon venoplasty. The patient then complains of foot pain. The venous catheter is advanced over a wire to the thrombus and suction thrombectomy performed. Follow-up angiography shows restoration of flow to the foot but rupture at the previous anastomotic stenosis requiring placement of a covered venous anastomotic stent.

**Thrombectomy Case 5 Codes:**

- 36147 – Catheter placement into AV shunt (with S&I)
- 36148 – Additional catheter placement into AV shunt
- 36870 – Thrombectomy, AV shunt
- 35476 – Venoplasty, AV shunt
- 75978 – Venoplasty, AV shunt, S&I
- 36247 – 3rd order selective catheter placement
- 75710-59 – unilateral extremity angiography, S &I
- 37186 – Secondary percutaneous arterial thrombectomy
- 37205 – Initial covered stent placement at venous anastomosis
- 75960 – Covered stent placement at venous anastomosis, S&I
Renal Graft Procedures: Open Codes

Insertion - Autogenous
- 36818 - AV anastomosis, open; by upper arm cephalic vein transposition
- 36819 - AV anastomosis, open; by upper arm basilic vein transposition
- 36820 - AV anastomosis, open; by forearm vein transposition
- 36821 - AV anastomosis, open; any site (e.g., Cimino type) - most common
- 36825 - Creation of AV fistula by other than direct AV anastomosis; autogenous graft

Insertion - Nonautogenous
- 36830 - Creation of AV fistula by other than direct AV anastomosis; nonautogenous graft (e.g., biological collagen, thermoplastic graft - PTFE)

Thrombectomy/Revision
- 36831 - Thrombectomy, open, AV fistula; without revision, autogenous or nonautogenous dialysis graft
- 36832 - Revision, open, AV fistula; without thrombectomy, autogenous or nonautogenous dialysis graft
- 36833 - Revision, open, AV fistula; with thrombectomy, autogenous or nonautogenous dialysis graft

Open Endovascular
- If venoplasty or stent placement procedure is performed at the same time as an open surgical procedure use the appropriate open procedural codes 35460, 35458, 37207 and 37208.

Hybrid Cases
- When an open incision and open Fogarty thrombectomy and additionally venoplasty and/or stenting is performed.
- Recommend 36831 (open thrombectomy without revision) as well as “open” venoplasty and/or stent codes for other indicated procedures.

Case 6:
Patient with diffuse central stenosis has an incision made and brachial artery dissected. A 6 mm PTFE Hero arterial graft is anastomosed to the brachial artery. A jugular puncture is made under ultrasound guidance with image obtained (documentation of permanent recorded image, vessel patency and needle access) and the Hero outflow component is inserted under fluoroscopy into the jugular vein and placed into the SVC. The central catheter component is then tunneled to the shoulder area where the two components are connected via the titanium connector.
Case 6 Codes:

- 36830 - For insertion of nonautogenous graft (only one arterial anastomosis is performed with the Hero procedure, add -52 modifier for physician billing)
- 36558 - For insertion of the tunneled outflow component into the jugular vein
- 77001 - Fluoroscopy
- 76937 - Ultrasound guidance for vascular access

Case 6:

Indications: The patient is a 43-year-old female with a deep left brachiobasilic fistula that is failing.
Operative Report: Percutaneous access of the left brachiobasilic fistula followed by placement of a 4-French sheath. A fistulogram is obtained. A left subclavian vein occlusion is identified. Over a Storq wire an 8-French sheath is placed. This area of occlusion is angioplastied with a 7mm followed by a 9 mm balloon. The SVC is found to be 80% stenosed. This is angioplastied with a 12 mm balloon. I then dissected out the fistula in its entirety. The axillary vein stenosis was opened. This was patched with bovine pericardium and 6-0 Prolene. A more peripheral venous stenosis was then patched with a bovine pericardium. The wound was copiously irrigated. I then elevated the fistula by placing a deeper layer of 2-0 and 3-0 Vicryls. The subcutaneous tissues were closed with 3-0 Vicryls followed by closure of skin with staples.
Interpretation of Images: There is a greater than 75% stenosis located in the distal portion of the fistula near the axilla and in the mid arm. The left subclavian vein is occluded. The SVC has 80% stenosis. Following bovine patches in the arm vein stenoses and balloon angioplasty in the subclavian vein and superior vena cava, there are no significant residual stenoses and a strong thrill is present in the fistula.

Case 7 Codes:

- 36147 - Access and imaging of fistula
- 35476 - Central venoplasty
- 75978 - S&I for central venoplasty
- 36832 - Open revision of AV fistula which includes elevation of fistula and patch angioplasty of stenosis within fistula

Case 7:

Indications: The patient is a 43-year-old female with a deep left brachiobasilic fistula that is failing.
Operative Report: Percutaneous access of the left brachiobasilic fistula followed by placement of a 4-French sheath. A fistulogram is obtained. A left subclavian vein occlusion is identified. Over a Storq wire an 8-French sheath is placed. This area of occlusion is angioplastied with a 7mm followed by a 9 mm balloon. The SVC is found to be 80% stenosed. This is angioplastied with a 12 mm balloon. I then dissected out the fistula in its entirety. The axillary vein stenosis was opened. This was patched with bovine pericardium and 6-0 Prolene. A more peripheral venous stenosis was then patched with a bovine pericardium. The wound was copiously irrigated. I then elevated the fistula by placing a deeper layer of 2-0 and 3-0 Vicryls. The subcutaneous tissues were closed with 3-0 Vicryls followed by closure of skin with staples.
Interpretation of Images: There is a greater than 75% stenosis located in the distal portion of the fistula near the axilla and in the mid arm. The left subclavian vein is occluded. The SVC has 80% stenosis. Following bovine patches in the arm vein stenoses and balloon angioplasty in the subclavian vein and superior vena cava, there are no significant residual stenoses and a strong thrill is present in the fistula.

Case 8 Codes:

- 36147 - Access and fistulogram
- 35476 - Peripheral venoplasty
- 75978 - S&I for peripheral venoplasty
- 35476-59 - Central venoplasty
- 75978-59 - Central venoplasty S&I
- 36832 - Revision of graft (accessory branch surgical ligation)

Case 8:

An AV fistula is accessed and fistulogram performed showing severe venous anastomotic stenosis, innominate vein stenosis, and a large accessory branch. A balloon catheter angioplasty is performed of the both stenosis and the sheath removed. Next, a small incision is made over the accessory branch which is dissected and then ligated. The incision is then closed.
Patient with thrombosed AV graft. An incision is made dissecting out the graft. A transverse graftotomy is made. A Fogarty catheter is used to perform a thrombectomy of the venous and arterial limbs of the graft. Via the graftotomy, a fistulogram is performed revealing a severe stenosis in the outflow. Via the graftotomy, a balloon catheter is inserted into the axillary vein stenosis and venoplasty performed with excellent results. The graft is closed with a 6-0 prolene followed by closure of the incision.

Case 9 Codes:
- 36831 - Open thrombectomy of AV graft
- 75791 - Fistulogram
- 35460 - Open venoplasty
- 75978 - Open venoplasty S&I