CHEST

Advanced Diagnostic and Therapeutic Bronchoscopy

Technology and Reimbursement

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Advanced interventional pulmonary procedures of the airways, pleural space, and mediastinum continue to evolve and be refined. Health care, finance, and clinical professionals are challenged by both the indications and related coding complexities. As the scope of interventional pulmonary procedures expands with advanced technique and medical innovation, program planning and ongoing collaboration among clinicians, finance executives, and reimbursement experts are key elements for success. We describe advanced bronchoscopic procedures, appropriate Current Procedural Terminology coding, valuations, and necessary modifiers to fill the knowledge gap between basic and advanced procedural coding. Our approach is to balance the description of procedures with the associated coding in a way that is of use to the proceduralist, the coding specialist, and other nonclinical professionals.

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Bronchoscopy continues to evolve in the diagnosis, palliation, and treatment of various benign and malignant conditions. Examples include lung cancer, sarcoidosis, interstitial lung disease, emphysema, severe asthma, and benign airways obstruction. The usefulness of advanced diagnostic and therapeutic procedures is well established. These advanced procedures and interventions increase the complexity of coding.[1] We describe the valuations, coding, and clinical usefulness of advanced diagnostic and therapeutic bronchoscopy.

Basic Principles of Coding and Reimbursement

Current Procedural Terminology (CPT) codes and relative value units (RVUs) are the property of the American Medical Association.[2] The CPT and RVU valuation process is complex and updated frequently. Each new procedure is given a distinct

ABBREVIATIONS: BO = balloon occlusion; CPT = Current Procedural Terminology; EBUS = endobronchial ultrasound; ENB = electromagnetic navigation bronchoscopy; FM = fiducial marker; NCCI = National Correct Coding Initiative; PDT = photodynamic therapy; RP-EBUS = radial probe endobronchial ultrasound; RVU = relative value unit; TBNA = transbronchial needle aspiration; TTNA = transthoracic needle aspiration; wRVU = work relative value unit

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description and associated CPT code that fits within a grouping of similar procedures. A particular subset of CPT codes (add-ons) are designated with a plus sign (+). These represent additional work associated with a specific related primary procedure and cannot be billed independently.[2] The RVU process assigns a value relative to existing services and procedures. Value is calculated based on complexity of skill, risk, time, or other similar variables. Each year, the Centers for Medicare and Medicaid Services assigns a dollar value (conversion factor) to 1 RVU nationally, which then is modified by predetermined geographical adjustments. The conversion factor is multiplied by the assigned RVU or work RVU (wRVU), depending on the location of service, to determine the reimbursement. The wRVU refers to the physician work only and does not include other aspects, such as practice expense or malpractice costs included in the total RVU. Overlapping procedures can be subject to the multiple endoscopy or multiple procedure rules as described previously.[3,4]

The Centers for Medicare and Medicaid Services established the National Correct Coding Initiative (NCCI) edits, which they revise quarterly. NCCI edits prospectively prevent improper payment when services have overlapping activity. NCCI edits impact procedures or encounters that take place at the same time that include work common to both to prevent duplication of payment for overlap. Modifier 59 is used to designate procedures and services, other than evaluation and management services, that are not typically reported together.[5-7] It is used to override the NCCI edit when permitted by NCCI, and only when the circumstances meet the definition of being appropriate.[6]

Advanced Diagnostic Bronchoscopy

Table 1 provides the CPT code descriptors for advanced bronchoscopic procedures and their associated wRVUs.

Convex Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration

Endobronchial ultrasound (EBUS)-guided transbronchial needle aspiration (TBNA) has revolutionized the diagnosis and staging of thoracic malignancies. It also has proven efficacy in diagnosing mediastinal masses, sarcoidosis, and infections. EBUS-guided TBNA's high yield, real-time visualization, and sampling essentially have replaced conventional TBNA sampling of mediastinal and hilar lymphadenopathy and airway-adjacent lesions.[3,4,8]

TABLE 1] Advanced Bronchoscopy and TTNA codes

CPT Code	Description	wRVU
31622	Bronchoscopy, flexible or rigid, including fluoroscopic guidance, when performed; diagnostic, with cell washing	2.53
31629	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with transbronchial needle aspiration biopsy, trachea, main stem, or lobar bronchus or bronchi, or a combination	3.75
31652	Bronchoscopy with endobronchial ultrasonography (EBUS)-guided transtracheal or transbronchial (or both) sampling (eg, aspiration)/biopsy), one or two (or both) mediastinal or hilar lymph node stations or structures	4.46
31653	Bronchoscopy with endobronchial ultrasonography (EBUS)-guided transtracheal or transbronchial sampling, or both (eg, aspiration)/biopsy), 3 or more mediastinal or hilar lymph node stations or structures (or both)	4.96
+31654	Bronchoscopy with transendoscopic endobronchial ultrasonography (EBUS) during bronchoscopic diagnostic or therapeutic interventions for peripheral lesions (list separately in addition to code for primary procedures)	1.40
31628	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with transbronchial lung biopsy(s), single lobe	3.55
+31632	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with transbronchial lung biopsy(s), each additional lobe (list separately in addition to code for primary procedure)	1.03
31627	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with computer-assisted, image-guided navigation (list separately in addition to code for primary procedure[s])	2.00
31626	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with placement of fiducial markers, single or multiple	3.91
32408	Core needle biopsy, lung or mediastinum, percutaneous, including imaging guidance, when performed	3.18

CPT = Current Procedural Terminology; TTNA = transthoracic needle aspiration; wRVU = work relative value unit.

The EBUS transducer, with or without a fluid-filled balloon, in direct contact with the airway wall facilitates visualization of lesions, vessels, and other structures adjacent to the wall. The needle is guided into the target lesion to obtain material for examination. Use of rapid onsite cytologic analysis can lead to fewer needle passes and avoidance of more invasive bronchoscopic sampling.[9] Complication rates for EBUS-guided TBNA are low for infection and bleeding.[10] CPT code 31652 is used for EBUS-guided TBNA when sampling up to two mediastinal or hilar lymph node stations or structures. CPT code 31653 is used when sampling three or more mediastinal or hilar lymph node stations or structures. Coding is the same whether needle aspiration or core biopsy samples are obtained.[4]

Radial Probe Endobronchial Ultrasound

Radial probe endobronchial ultrasound (RP-EBUS) uses a flexible miniature ultrasound (20 MHz) probe via the working channel of a bronchoscope to produce a 360° image to localize peripheral pulmonary nodules.[11] The probe is advanced via the segmental airways, usually with fluoroscopic guidance, until an image is obtained. It can be used with a guide sheath left in place near the lesion or in concert with smaller-caliber scopes as a conduit for sampling instruments (brushes, forceps, or needles). Diagnostic yields for RP-EBUS range between 49% and 69%.[12,13] Yield increases with nodule size, central positioning of the probe within the lesion, and bronchus sign on chest imaging,[12] and in conjunction with navigational bronchoscopy.[14] CPT code +31654 is used when RP-EBUS is performed and is an add-on code to the primary procedure.

Electromagnetic Navigation Bronchoscopy

CT scan data are used to create a virtual airway map to navigate to specific lesions. Electromagnetic navigation bronchoscopy (ENB) typically consists of an electromagnetic field generator, planning software, an extended working channel and locatable guide, or sampling instruments. These are introduced through the bronchoscope. They are directed along a virtual airway map and tracked within the electromagnetic field in multiple planes. Sampling is carried out when the target is reached. Different system variations offer trackable biopsy instruments, digital tomosynthesis, robotic assistance, shape-sensing technology, and integration of augmented fluoroscopy for better localization of the targets. Diagnostic yields for ENB vary widely based on patient selection and diagnostic techniques. Studies have found yields as low as 38.5% for ENB alone and up to 70.6% when used with RP-EBUS.[15,16] ENB has a low complication rate of pneumothorax (3.1%-4.9%), about half requiring drainage,[17,18] and bleeding (2.3%).[18] RP-EBUS, upper- and middle-lobe lesions, and use of general anesthesia improve diagnostic yield.[17] CPT code 31627 is used when ENB or computer-assisted, image-guided navigation is performed and is listed in addition to other codes for the primary bronchoscopy procedure.[19]

Electromagnetic Navigation-Guided Transthoracic Needle Aspiration

Electromagnetic navigation-guided transthoracic needle aspiration (TTNA) can be performed via tip tracked instruments. ELECTROMAGNETIC NAVIGATION-GUIDEDTTNA uses the same CT data as ENB. The navigational needle is directed towards the target by aligning crosshairs in multiple planes, similar to ENB and the target is sampled when reached. A pilot study of 24 subjects found electromagnetic navigation-guided TTNA to have a diagnostic yield of 83% when performed alone and of 92% when combined with ENB and convex EBUS,[20] with a pneumothorax rate of 21% and 8% requiring drainage, similar to CT scan-guided TTNA.[21] Larger studies are needed to evaluate this novel technology fully. This multipronged approach potentially allows diagnosis and staging of thoracic malignancies in one setting. CPT code 32405 is used when TTNA or biopsy of a lung nodule or mass is performed. If performed in conjunction with ENB, append modifier 59.

Fiducial Marker Placement and Dye Marking

Fiducial markers (FMs) are used to help localize lesions for surgical resection or stereotactic radiotherapy. Comorbidities or patient preference may limit the option of curative resection in some early-stage lung cancer patients, and stereotactic radiosurgery is an alternative.[22,23] FMs aid in targeting difficult-to-localize lung nodules. Similar to FMs, dye marking of peripheral pulmonary nodules can be performed before video-assisted thoracic surgery to aid localization of a difficult-to-find nodule.[24] FMs can be placed bronchoscopically using RP-EBUS with a guide sheath, ENB,[25] or a transthoracic approach. Convex probe EBUS has been used to deploy FMs into central pulmonary lesions.[26] Bronchoscopic rather than transthoracic approaches are associated with fewer complications, with a pneumothorax rate of $< 5\%$ vs 47%.[27,28] CPT code 31626 is used for bronchoscopic FM placement regardless of the number or type of markers placed.

TABLE 2] Therapeutic Bronchoscopy Codes

CPT Code	Short Description	Code Description	wRVU
31630	Dilation	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with tracheal/bronchial dilation or closed reduction of fracture	3.81
31635	Foreign body removal	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with removal of foreign body	3.42
31631	Tracheal stent	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with placement of tracheal stent(s) (includes tracheal/bronchial dilation as required)	4.36
31636	Bronchial stent	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with placement of bronchial stent(s) (includes tracheal/bronchial dilation as required), initial bronchus	4.30
+31637	Each additional stent	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; each additional major bronchus stented (list separately in addition to code for primary procedure)	1.58
31638	Revision of stent	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with revision of tracheal or bronchial stent inserted at previous session (includes tracheal/bronchial dilation as required)	4.88
31640	Excision of tumor	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with excision of tumor	4.93
31641	Destruction or relief if stenosis by any method	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with destruction of tumor or relief of stenosis by any method other than excision (eg, laser therapy, cryotherapy)	5.02
36145	Therapeutic aspiration (initial)	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with therapeutic aspiration of tracheobronchial tree, initial	2.88
31646	Therapeutic aspiration (subsequent)	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with therapeutic aspiration of tracheobronchial tree, subsequent, same hospital stay	2.78
96570	PDT-first 30 min	Photodynamic therapy by endoscopic application of light to ablate abnormal tissue via activation of photosensitive drug(s); first 30 min (list separately in addition to code for endoscopy or bronchoscopy procedures of lung and GI tract)	1.10
96571	PDT-addl 15 min	Photodynamic therapy by endoscopic application of light to ablate abnormal tissue via activation of photosensitive drug(s); each additional 15 min (list separately in addition to code for endoscopy or bronchoscopy procedures of lung and GI tract)	0.55

CPT = Current Procedural Terminology; PDT = photodynamic therapy; wRVU = work relative value unit.

Therapeutic Bronchoscopy

No distinction is made between rigid and flexible bronchoscopy coding. The concept that rigid bronchoscopy is more difficult and requires a different level of training is not captured in CPT codes. Also, many procedures and techniques used in therapeutic bronchoscopy have add-on codes, have no codes, or are techniques applied from other specialties (eg, ear, nose, and throat) such that the use of unlisted codes or nonbronchoscopy codes and modifiers can be considered. Table 2 provides the CPT code descriptors for therapeutic bronchoscopy and their associated wRVUs.

Therapeutic Aspiration of Secretions

Two codes exist for therapeutic aspiration of secretions, with recent clarifications provided about their use. CPT code 31645 is for the initial therapeutic aspiration bronchoscopy during a distinct hospitalization. CPT code 31646 is for each subsequent therapeutic aspiration bronchoscopy by the same group during that hospitalization, regardless of operator. This would be a common scenario when a patient is on a ventilator requiring "toilet" bronchoscopy on several occasions to help manage a large volume of secretions or blood clots.

Airway Dilation

Airway dilation can be performed using a variety of tools and may be an adjunct to performing stenting.[29] CPT code 31630 does not specify balloon dilation, so no difference exists between rigid or flexible dilation of an airway stenosis or stricture with a balloon, rigid bronchoscope, any bougie, or dilator.

Airway Stenting

Airway stenting is performed with flexible or rigid bronchoscopy, with or without fluoroscopy, of one or multiple airways. In most, airway dilation is assumed, and so is not coded along with the stenting codes, unless a distinct airway from that stented is dilated (ie, other nonstented bronchus). Tracheal stenting, CPT code 31631, is different from bronchial stenting, CPT code 31636. CPT add-on code +31637 is used when an additional stent is placed in a distinct bronchus. Note that the wRVUs are relatively smaller because they build on the initial work and are not independent. Stent removal is treated as foreign body removal, CPT code 31635. Removal of uncovered metal stents after epithelialization is complex, so the use of an extended work 22 modifier is appropriate when documented.[30-32] Stent revision, CPT code 31638, is applied when an existing stent needs to be repositioned, modified, or replaced. The higher wRVU for stent revision recognizes the extra work to remove and replace an existing stent.[33] If ablation or excision of a lesion is performed during the stenting procedure, the multiple endoscopy rule applies when using these other codes.[1]

Special Considerations in Airway Stenting

A T-tube is a tracheal stent, and its placement is different than that of a tracheostomy or tracheostomy tube change. It typically requires general anesthesia and rigid bronchoscopy to implant.[34-37] Implanting a T-tube tracheal stent uses the CPT code 31631 and when changed uses CPT code 31638. A Y-stent is a tracheal stent with additional branches for the left and right main bronchi. As such, the coding is for tracheal (CPT code 31631), bronchial (CPT code 31636), and an additional bronchial (CPT add-on code +31637) stent.

Ablation and Resection

Many bronchoscopic ablative techniques exist. Many types of laser therapy, electrosurgery, argon plasma coagulation, and two methods of cryotherapy are well described.[38] Any bronchoscopic tissue ablation is CPT code 31641. New techniques such as electroporation and microwave ablation are coded the same. The only exception is photodynamic therapy (PDT), which has its own codes. If the procedure includes both CPT code 31640 (excision) and CPT code 31641, the multiple endoscopy rule or NCCI edits may apply and impact reimbursement.

PDT

PDT is a delayed-onset ablative technique using a photosensitizer. After cellular uptake of the photosensitizer, the target is exposed to a light wavelength specific to that photosensitizer. This induces a photo-oxidative intracellular reaction involving reactive oxygen species with direct toxicity and indirect effects including ischemia and immune-inflammatory effects that lead to cell death and necrosis.[39] Bronchoscopic PDT typically is used as a palliative measure or adjunctive therapy in cases of nonoperable malignant airway obstruction or other endoluminal lesions that are nonsevere or require emergency intervention.

Bronchoscopic PDT has several stages. First, photosensitizer, typically porfimer sodium, is administered intravenously at 2 mg/kg.[39,40] After infusion, a time delay allows the photosensitizer to be distributed and absorbed; 24 to 72 h for porfimer sodium. After this, bronchoscopy is performed to administer the light with a cylindrical diffuser at the matching wavelength (typically 630 nm). The diffuser is introduced via the working channel, positioned parallel to the target, and activated to deliver the desired energy (200 J/cm). Coding is based on activation time and is an add-on to the base bronchoscopy procedure (eg, CPT code 31641, described previously). For the first 30 min of activation, CPT code +96570 is used. Append 52 modifier[7] if activation time is less than 23 min. CPT code +96571 is used for each additional 15-min increment of activation beyond the initial 30 min. A therapeutic aspiration bronchoscopy (CPT code 31645) typically is performed 2 to 4 days after illumination to remove secretions, sloughing, and necrotic tissue. A repeat illumination can be considered during the follow-up bronchoscopy if deemed appropriate. Photosensitivity is the main adverse effect of PDT, requiring photosensitive precautions with skin and eye protection for up to 6 weeks.

Bronchial Thermoplasty

Bronchial thermoplasty is a series of three treatments for severe persistent asthma shown to improve quality of life with a durable response. Bronchial thermoplasty delivers targeted radiofrequency energy to bronchial airway walls in 5-mm increments and results in the partial ablation of airway smooth muscle that contributes to bronchoconstriction.[41,42] The typical sequence of procedures starts with a lower lobe (CPT code 31660), then the contralateral lower lobe (CPT code 31660), and then both upper lobes (CPT code 31661), with at least 3-week intervals between sessions.[42,43] The right middle lobe is not treated because of the risk of right middle lobe syndrome. After the three sessions are completed, bronchial thermoplasty is not repeatable.

Endobronchial Valves

The Food and Drug Administration has approved two different valves for the treatment of emphysema and granted a Human Device Exemption for the use of valves for the treatment of persistent bronchopleural fistula after lung volume reduction surgery, lobectomy, or segmentectomy.[44,45]

Bronchoscopic Lung Volume Reduction

Bronchoscopic lung volume reduction is a nonsurgical, minimally invasive technique to achieve lung volume reduction via endobronchial valves. It involves placing one-way valves into the targeted diseased lobe, which allows for air and secretions to exit and achieve lobar atelectasis.[46,47] Presently, two types of valves are in use: Zephyr (Pulmonx, Inc.) and Spiration (Spiration, Inc.).

Both types involve a thorough preprocedural selection process to qualify for treatment. This includes analysis of a patient's pulmonary function, functional assessment, and high-resolution CT scanning to assess for collateral ventilation and fissure completeness. For the Pulmonx system (Pulmonx, Inc.), the Chartis Pulmonary Assessment System is used to confirm the lack of collateral ventilation before valve placement.[48,49] A dedicated balloon catheter is placed endoscopically into the targeted lobe to occlude the intended airway and monitor airflow and pressure to assess the presence or absence of collateral ventilation. The Spiration system relies on degree of CT scan fissure integrity to assess for lack of collateral ventilation. If minimal or no collateral ventilation is found in the targeted lobe, appropriately sized valves are placed. Once the targeted airway is in view, the dedicated catheter (with compressed valve at the distal aspect) is advanced into position in the bronchus. The valve is deployed and self-expands. Multiple valves typically are deployed based on the size of airway branches and how many are needed to block ventilation fully. Some maneuvering is available after being deployed; however, a valve cannot be reused or redeployed. Valve coding is based on lobes targeted regardless of the number of valves used. CPT code 31647 is for a single lobe, and CPT add-on code +31651 is for each additional lobe. If no valves are placed, see the Balloon Occlusion section.

Prolonged Air Leak

A prolonged air leak or bronchopleural fistula is a pathologic communication between the airway and pleural space. These are seen most commonly after thoracic surgery involving pulmonary parenchymal resection,[50,51] but also can develop after biopsy or trauma or as a result of spontaneous pneumothorax.[52] As soon as the air leak has been persistent beyond 5 days, it is classified as prolonged air leak.

If conservative measures fail, endobronchial valve placement is an option. A balloon catheter is used to occlude selected airways to localize the source of the leak.[53] Patient intubation allows for a closed system to facilitate detection and treatment of the leak. Lobar airways are occluded sequentially using the balloon catheter and monitoring for decrease or resolution of the air leak as seen in the chest tube drainage system. This can take up to 2 to 3 min per occlusion. As soon as the leak is noticeably decreased or resolved with occlusion, more distal airways are occluded similarly to localize the source(s) of the leak. Typically, multiple bronchi lead to the bronchopleural fistula. As soon as the source of the leak is identified, endobronchial valve(s) placement is as described previously.[54] If no valves are placed, see the Balloon Occlusion section.

Endobronchial Valve Removal

Whether by plan, as with prolonged air leak patients, or necessity, endobronchial valves may be removed. This is achieved by using forceps and retracting the bronchoscope and forceps as a unit. Caution should be exercised while removing the valve to avoid airway and vocal cord injury during removal. CPT code 31648 is for valve(s) removal from one lobe and CPT add-on code +31649 is for removal from each additional lobe, regardless of number removed from each.

Balloon Occlusion

CPT code 31634 is for balloon occlusion (BO). BO is used in cases of suspected bronchopleural fistula to assess the location of an air leak systematically and, when done, treat it with injection of fibrin glue or other substance. It also applies if collateral ventilation is detected after BO and valve implantation for bronchoscopic lung volume reduction is aborted. If valves are placed, CPT code 31634 is not reported because BO is part of the placement work. The BO code also applies for balloon airway tamponade.

Percutaneous Tracheostomy

Table 3 provides the CPT code descriptors for tracheostomy procedures and their associated wRVUs. The CPT code for planned tracheostomy is 31600. Percutaneous tracheostomy is performed in the intubated and sedated or medically paralyzed patient. A needle and guidewire are inserted, typically under bronchoscopic guidance, at the desired entry point, and dilation is

TABLE 3] Tracheostomy, Valves, and Bronchial Thermoplasty Codes

CPT Code	Short Description	Code Description	wRVU
31600	Percutaneous tracheostomy	Opening of windpipe through neck for insertion of breathing tube	5.56
31634	Balloon occlusion	Bronchoscopy, rigid with balloon occlusion, with assessment of air leak or flexible, including fluoroscopic guidance, when performed; with administration of occlusive substance (eg, fibrin glue), if performed (do not report 31634 in conjunction with 31647, 31651 at the same session)	3.75
31647	Insertion of valves (initial)	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with balloon occlusion, when performed, assessment of air leak, airway sizing, and insertion of bronchial valve(s), initial lobe	4.15
31648	Removal of valves	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with removal of bronchial valve(s), initial lobe	3.95
+31651	Insertion of valves (additional lobe)	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with balloon occlusion, when performed, assessment of air leak, airway sizing, and insertion of bronchial valve(s), each additional lobe (use 31651 in conjunction with 31647)	1.58
+31649	Removal of valves	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with removal of bronchial valve(s), each additional lobe (list separately in addition to code for primary procedure) (use 31649 in conjunction with 31648)	1.44
31660	Thermoplasty one lobe	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with bronchial thermoplasty, one lobe	4.00
31661	Thermoplasty two lobes	Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with bronchial thermoplasty, two or more lobes	4.25

CPT = Current Procedural Terminology; wRVU = work relative value unit.

performed, followed by insertion of the tracheostomy tube. Clinical confirmation is carried out, and the tube then is secured according to usual methods.[55] Additional details of this procedure are well described in an article by Singh and Sing.[56] All work is captured in CPT code 31600. If the operator performs other distinct bronchoscopy work, BAL or therapeutic aspiration, for example, these must be documented to clarify the medical necessity for these additional procedures with their distinct codes.

A common coding question is whether a CPT code exists for tracheostomy tube change. Two different clinical scenarios apply. Tube change before establishment of a mature fistula tract is reported with CPT code 31502. No distinct code exists for routine tracheostomy tube change after the tract is established. Use evaluation and management coding as appropriate to the level of service provided (eg, CPT codes 99212-99215).

Transbronchial Cryobiopsy

Transbronchial cryobiopsy uses a gas-frozen catheter to extract an adherent biopsy specimen. It does not have a unique code to account for its complexity. An expert panel describes it as: "Bronchoscopy, rigid or flexible, including fluoroscopic guidance, when performed; with transbronchial cryobiopsy."[57] However, this is not an adopted CPT description. It is more complicated than the standard peripheral transbronchial lung biopsy commonly performed with moderate sedation. These procedures are always performed with general anesthesia with an endotracheal tube or rigid bronchoscopy on individuals with severe interstitial lung disease. The risk of major complications of bleeding or pneumothorax is up to 20%. A balloon occlusion device to provide tamponade after each pass is a required element of the procedure. Although this is fundamentally a different procedure with increased risk that requires greater skill than basic transbronchial biopsy, no separate code exists currently. As such, the coding is based on the standard transbronchial procedure in which several biopsy samples are obtained from segments within a single lobe (CPT code 31628) or possibly additional lobes (CPT code +31632), with the added use of balloon occlusion for tamponade (CPT code 31634). NCCI edit may prevent this combination, and unique payer policies may require the use of an unlisted procedure code (CPT code 32999). A 22 Modifier that is used for extended work over a typical procedure may be added with clear documentation of the increased time and work.[1,7]

Endobronchial Injection of Medication

The literature on the endoscopic injection of medication is broad. Treatment of bronchial stenosis with steroid injection

or injection or topical application of drugs like mitomycin C and injection of amphotericin B into aspergillomas have been described.[58,59] Coding for these procedures may be adopted from ear, nose, and throat surgery. CPT code 31573 (laryngoscopy, flexible; with therapeutic injection(s) [eg, chemotherapy denervation agent or corticosteroid, injected percutaneous, transoral, or via endoscope channel], unilateral) is used.[2] The most common airway procedure for this technique is the management of inflammatory airway diseases like granulomatosis with polyangiitis or iatrogenic tracheal stenosis.[60]

For a procedure without an assigned CPT code, the standard is to use a code that exists and reasonably fits the procedure performed. If no such code exists, an unlisted code is used. The proper use of these unlisted codes may be dependent on payer guidelines. Use unlisted procedure codes 31899 (trachea, bronchi) or 32999 (lungs, pleura).

Bronchography

This code originally was used when contrast was injected into the airways to assess bronchiectasis before the broad availability of CT scan technology. Because it was used so infrequently, the Centers for Medicare and Medicaid Services retired the code. A modern use of bronchography exists in which contrast agent is injected via bronchoscopy with a needle through an occluded airway to see if a possible distal airway can be reclaimed.[61] Because the bronchography code no longer exists, other therapeutic codes of balloon dilation, debulking, or any ablative technique are reported, when performed.

Conclusions

Although the clinical usefulness of advanced diagnostic and therapeutic bronchoscopy is accepted widely, the coding remains confusing because of procedure complexity and coding requirements. The range of procedures discussed may be performed as stand-alone procedures; however, they are performed more commonly with other complex or basic pulmonary procedures. With improved technology, efficiency, and efficacy of performing multiple procedures in the same setting, it becomes critical to understand thoroughly the clinical, coding, and financial implications of these procedures. Appropriately optimizing facility and physician reimbursement is integral to the adoption of advanced diagnostic and therapeutic bronchoscopy.

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