

# The Business of Interventional Pulmonology

Christopher T. Erb, MD, PhD<sup>a</sup>, Armin Ernst, MHCM, MD<sup>b,c</sup>,  
Gaëtane C. Michaud, MS, MD, FRCP(C)<sup>a,\*</sup>

## KEYWORDS

• Interventional pulmonology • Billing • Coding • Reimbursement • Practice building • Insurance

## KEY POINTS

- Future changes are inevitable in funding and reimbursement arrangements.
- Understanding and effectively using the current systems of reimbursement is critical.
- It will be imperative for interventional pulmonology practices to be nimble and adapt to the changing landscape of medical need, legislative mandates, and reimbursement policy.
- Interventional pulmonologists are regularly asked to perform more complicated and advanced procedures, but the reimbursement for time, effort, and skill involved in these procedures has not kept up with reimbursement for other procedural specialties.

## INTRODUCTION

Health care finance, in particular, reimbursement for services rendered, is complex and there are multiple means by which physicians are reimbursed for services. To appreciate the potential barriers to procedural reimbursement, it is essential to first understand the means by which care costs are currently being covered and then predict the impact of health care reform on the business of interventional pulmonology (IP).

## INSURANCE AND HOW IT IMPACTS REIMBURSEMENT

### *Private Insurance*

Most working Americans obtain health insurance through their employers in the form of an employment benefits package.<sup>1</sup> Employers and employees enjoy a tax advantage as a result of offering and receiving health insurance benefits through the employment relationship. Most employers offer their workers a selection of health

insurance plans to choose from; these plans vary in scope of coverage, costs of premiums, and the amount of co-insurance and deductible to be paid by the employee.<sup>2,3</sup> Employers and employees generally share the costs of the insurance. Employer-provided group insurance usually costs less and offers more benefits than individual health insurance plans.

Employer-sponsored health insurance plans are typically either fee-for-service or various types of managed care plans (health maintenance organizations, HMOs, or preferred provider organizations). Fee-for-service insurance is a traditional form of health insurance in which, after providing health care services, the health care provider (or sometimes the patient) sends a bill to the insurance company. A typical fee-for-service plan may pay 80% of a medical bill, leaving 20% to be paid by the individual, known as “co-insurance,” or may follow some other kind of pre-negotiated payment arrangement. This form of insurance, which was also known as indemnity

<sup>a</sup> Pulmonary, Critical Care and Sleep Medicine, Yale School of Medicine, 20 York Street, New Haven, CT 06510, USA; <sup>b</sup> Pulmonary, Critical Care and Sleep Medicine, Tufts School of Medicine, Boston, MA, USA; <sup>c</sup> Reliant Medical Group, 100 Front Street, 14th Floor, Worcester, MA 01608, USA

\* Corresponding author. Pulmonary, Critical Care and Sleep Medicine, Yale School of Medicine, 15 York Street, LCI 100-C, New Haven, CT 06510.

E-mail address: [Gaetane.michaud@yale.edu](mailto:Gaetane.michaud@yale.edu)

insurance, declined sharply in the 1990s as various forms of managed care organizations were introduced into the health insurance marketplace.<sup>4,5</sup>

HMOs are prepaid health insurance plans to which members pay a monthly premium. In exchange, the HMO provides comprehensive coverage, including physician visits, hospital stays, laboratory tests, and therapy. In most HMOs, members are assigned or choose a physician who serves as their primary care physician. The primary care physician monitors the patient's health and provides basic medical care and is also responsible for referring patients to a specialist and other health care professionals as needed. Most HMOs do not require a deductible each year, but they do generally require a small copayment for each medical encounter. Because HMOs receive a fixed fee per member per month, they may focus more on providing preventative health care services, such as immunizations, mammograms, and physicals, and may be more restrictive of more advanced or experimental treatments. They may require "preauthorization" for advanced procedures. Procedures such as electromagnetic navigational bronchoscopy often fall into the category of "experimental" despite the growing evidence to support its use for peripheral nodules and the approval process may be challenging. Preferred provider organizations are a variation on HMOs that are generally less flexible than traditional fee-for-service insurance plans, but more flexible than HMOs in terms of restrictions on where and from whom patients can receive care.<sup>6</sup>

### ***Medicare and Medicaid***

Medicare and Medicaid are the 2 most important government-sponsored health insurance programs. Title XVIII of the Social Security Act of 1965 established Medicare. It is a federal health care program that covers most individuals 65 years or older as well as those under age 65 with certain disabilities, and patients of all ages requiring dialysis or renal transplant.

Medicare Part A provides basic coverage for hospital stays, posthospital skilled nursing facility care, home health care, and hospice care and is financed from employee and employer contributions. Medicare Part B is medical insurance, which can be purchased by paying an additional monthly premium. It pays for physician and laboratory costs as well as some outpatient medical services, such as medical equipment and supplies, home health care, and physical therapy. Medicare Part C is an alternative in which individuals with Parts A and B can voluntarily choose to receive all of their health care services from a Medicare-

managed care plan provided through private insurance companies.<sup>7,8</sup> Medicare Part D is a voluntary supplemental prescription drug program that requires an additional monthly premium.

For the most part, Medicare makes payments to providers on a fee-for-service basis, but it negotiates deep discounts for many services and procedures compared with most private insurance plans. Some private insurance companies use similar relative value unitlike reimbursement schedules, as discussed in detail later in this article. Newer payment incentives are being proposed that would adjust payments by markers of quality, efficiency, and outcomes.

Medicaid, on the other hand, is a joint federal-state health insurance program for individuals and families with low incomes and limited resources.<sup>9</sup> Although the federal government establishes broad guidelines for the Medicaid program, each state establishes its own eligibility standards, benefit packages, payment rates, and program administration. As a result, there are essentially 56 different Medicaid programs—one for each state, territory, and the District of Columbia. Medicaid programs generally cover physician services, inpatient and outpatient hospital care, nursing facility services, prescription drugs, dental care, physical therapy, rehabilitation services, and hospice care. Medicaid also pays providers primarily on a fee-for-service basis after negotiated discounts. Payment rates vary on a state-by-state basis and may fail to cover the actual cost of an interventional pulmonary procedure.

### **REIMBURSEMENT FOR PULMONARY PROCEDURES**

The most common means of reimbursement in North America is fee-for-service. In essence physicians are paid for each individual service rendered in this model of payment. Alternate means of reimbursement for physicians include relative value units (RVUs), capitation, pay for performance, and salary. In the advent of health care reform and cost containment in the United States and Canada, respectively, alternatives to fee-for-service are being sought and the means by which physicians will be reimbursed for services may be in flux over the next several years. Many provinces of Canada have alternate funding plans, a pay-for-performance-like incentive structure whereby physicians receive a base salary and in addition receive a performance-based incentive. The province negotiates salaries for various physician groups with the health care organization. In the United States, pay for performance, medical home, and accountable care organizations (ACO)

are some of the alternatives currently being integrated as part of health care reform.

### ***Pay for Performance***

Pay for performance has many faces depending on the type of practice, but essentially it involves incentivizing physicians based on quality and/or efficiency metrics. There is ample evidence to suggest that more advanced training or subspecialization leads to better procedural outcomes, and this form of payment would potentially be favorable to interventional pulmonologists with specialized training who perform a higher volume of certain procedures, such as endobronchial ultrasound for lung cancer staging.<sup>10–12</sup> At present, no metrics or quality benchmarks have been established for interventional pulmonology; however, the AQUIRE initiative by the American College of Chest Physicians was established with this as a primary objective. In a pay-for-performance system, one might anticipate a financial disincentive for performing diagnostic procedures, such as transbronchial needle aspiration (TBNA) with less proficiency than an established minimal diagnostic yield.

### ***Medical Home***

With respect to medical home, this strategy takes a more holistic approach whereby the primary care physician plays a central role and manages the entire care team, including any required specialists.<sup>13,14</sup> Under the medical home arrangement, the interventional pulmonologist or thoracic surgeon would be invited to provide an episode of care or procedure for a patient and would be paid from funds controlled by the referring primary care physician. A prespecified sum is paid for the care of the patient and distributed by the medical home as appropriate. Disease-specific medical homes have also been proposed, particularly in the context of a complex chronic disease whereby the central physician would drive the care of the patient. One could imagine a lung cancer medical home with the pulmonologist or medical oncologist becoming a primary care of sorts and managing the disease-specific care of the patient, including testing, counseling, and therapy, provided by the patient's multidisciplinary team. The interventional pulmonologist or thoracic surgeon in this context could be either a team leader or alternatively a member of the multidisciplinary team and be compensated for their portion of the care provided by the service line. The idea of a more comprehensive "medical neighborhood" that would more seamlessly incorporate and integrate subspecialty care into the medical home has also been proposed.<sup>15</sup>

### ***ACO***

ACO are a form of managed care designed to promote quality and minimize cost.<sup>16</sup> Although on the surface this may seem similar to a HMO of the 1990s, it is a distinct model. In such a system, a network of physicians or an entire hospital would take responsibility for the care of a group of patients. They would assume both the clinical and the financial burden of their care. Quality metrics would be implemented and the cost of providing the care would be compared with that traditionally paid for by Medicare for the same care. Providers are incentivized if both the quality and the cost reduction targets are met. Incentives are in the form of a predetermined proportion of the cost savings. Models such as these promote cost-effective care and published/unpublished data would suggest that management of pleural disease, mediastinal staging, and lung nodules by intervention pulmonary procedures is cost-effective.<sup>17–21</sup> It is likely on this basis that centers such as Kaiser Permanente have expanded their services to include interventional pulmonary procedures. An ACO model may be advantageous in interventional pulmonology considering the relatively poor fee-for-service procedural reimbursement.

### ***Fee for Service***

Most centers in Canada and the United States are fee-for-service. In a fee-for-service model, the interventional pulmonologist, thoracic surgeon, or his/her surrogate negotiates with payers a fee for the procedure or episode of care based on a predetermined fee schedule. The fee schedule assigns an amount according to the current procedural terminology (CPT) code for said procedure. The major concerns with this model are 2-fold: (1) it incentivizes physicians to perform procedures to generate revenue and (2) it may not adequately compensate for physician time or be commensurate with the specialized skill/training necessary to perform the procedure proficiently. In Canada, additional monies may be allocated to physicians based on the time of day the procedure is performed or alternatively the time it takes to perform the procedure. Some interventional pulmonology procedures are subject to a global fee (ie, a single payment for the entire episode of care including the postprocedural management). Thoracoscopy falls into this category. Compensation for the same procedure is highly variable in a fee-for-service model depending on the payer. Self-pay and private insurance tend to reimburse much higher than Medicare or Medicaid for the same service. As stated, reimbursement is subject to discounts negotiated by the care facility and this

may be a significant proportion of the billed service.

It is important for interventional pulmonologists to keep in mind the facility fees associated with the procedures as this significantly impacts the true cost of the procedure as well as downstream revenue. Those planning to establish a pulmonary procedure service or interventional pulmonary practice need to consider not simply the initial investment for equipment to perform procedures but also all the many direct and indirect costs. The direct costs of pulmonary procedures would include non-reusable materials, such as forceps, chest tubes, or transbronchial needles, equipment such as bronchoscopes, and labor (ie, the nursing or technical support in the procedure room). Indirect costs on the other hand would take into account the overhead incurred for the bronchoscopy suite and/or operating room. In addition, medicolegal support, maintenance, administration, billings, and collections are all considered indirect costs. The importance of considering all of the costs attributable to a procedure is that these are distributed over the entire patient population served by the interventional pulmonologist and highly influence the potential for downstream revenue generation.<sup>22</sup> There is a minimum number of procedures to be performed by any given institution to break even, and profit will be nonexistent until this threshold is met. Only once this threshold is exceeded does an interventional pulmonary practice become revenue-generating for its sponsoring institution. The breakeven point is individualized but should be considered before establishing a new pleural or bronchoscopy service line.

**RVU**

The RVU system is a scale used by Medicare and many private insurance companies to determine payments to providers. The scale is adjusted by the amount of physician work, practice expense, and professional liability coverage required to provide a given service.<sup>23</sup> A physician work RVU

is assigned based on the amount of time, mental effort, and judgment, as well as technical skill and effort required to perform each service. Despite many advances in technology in interventional pulmonology, many of the assigned RVUs have remained stable. The practice expense component takes into account the nonphysician labor, building space, equipment, and supplies required to run a practice. The practice expense RVU payment value varies by the location where the procedure is being provided: if in a physician office or clinic, more of the infrastructure expense is incurred by the physician practice and the RVU is higher. On the contrary, when performed in a facility such as a hospital-based procedure center, the practice expense RVU is considerably lower because most of the infrastructure expense is embedded in the facility’s costs, which in part explains the move in gastroenterology to provide procedural services in outside procedure centers or “surgi-centers.”

Each procedure or service is assigned an RVU according to this scale, and payment is commensurate with the RVUs assigned. For example, the standard multiplier in 2013 is \$34.023, which is flat from the 2012 value. A geographic practice cost index is applied to each service to account for regional differences in the cost of maintaining a practice and the variation in liability insurance. Physician work and practice expenses account for about 96% of the RVU payment and liability insurance for only 4%. **Table 1** provides a tabular representation of the RVU breakdown for commonly performed IP procedures.

**CODING AND BILLING FOR PROCEDURAL SERVICES**

**CPT Codes**

CPT codes are published by the American Medical Association (AMA) and are used to describe procedures and services for purposes of billing public and private health insurance companies.<sup>24</sup> There are 3 categories of CPT codes that are used in

Table 1 Examples of common IP procedures and their assigned RVUs					
CPT Code	Procedure	Work RVU	Nonfacility RVU	Facility RVU	Malpractice
31622	Bronch with BAL	2.78	6.48	1.24	0.34
31628	Bronch with TBBx	3.36	6.56	1.40	0.31
31625	Bronch with EBBx	3.80	7.43	1.54	0.30
32555	Thoracentesis w/ U/S	2.27	16.70	0.80	0.23
32557	Chest tube w/ U/S	3.12	24.68	1.07	0.69

Abbreviations: BAL, bronchial alveolar lavage; Bronch, bronchoscopy; EBBx, endobronchial biopsy; TBBx, transbronchial biopsy; U/S, Ultrasound.

distinct ways by insurance companies. Category I codes describe commonly performed services and procedures that are well-established in medical practice in the United States and are Food and Drug Administration (FDA)-approved. Category II codes are used to track performance measures and are added to the main 5-digit category I CPT code but cannot be used alone. Category III codes are assigned to new or emerging technologies and procedures and are considered temporary. They will either lead to a full category I code within 5 years or they will disappear if the

procedure does not come into widespread use or achieve FDA approval. Category III codes require documentation of safety and efficacy in the form of trials published in peer-reviewed literature, as well as support from practitioners in the field who are likely to provide the service or perform the procedure in question. Per HIPAA (Health Insurance Portability and Accountability Act) guidelines, insurance companies are not allowed to deny payment of category III codes. A set reimbursement is assigned to each code as well as a commensurate RVU. **Table 2** lists commonly used CPT codes and

**Table 2**  
**Common CPT codes for pulmonary procedures and their work RVUs**

Common CPT Codes for Pulmonary Procedures		
Procedure	CPT Code	Work RVU
Bronchoscopy	31622	2.78
Brushings	31623	2.88
BAL	31624	2.88
EBBx	31625	3.36
TBBx	31628	3.80
ENB	31627	2.00
TBNA	31629	4.09
EBUS	31620	1.42
Tracheal dilatation	31630	3.81
Stent placement	31631	4.36
Removal of FB	31635	3.67
Excision of tumor	31640	4.93
Destruction of tumor	31641	5.02
Therapeutic Aspiration	31645	3.16
Thoracentesis	32555/4 (with/without imaging)	2.27/2.50
Chest tube	32557/6 (with/without imaging)	2.50/3.12
Thoracostomy	32551	3.29
Tunneled pleural catheter	32550	4.17
Pleurodesis/instillation of thrombolytic	32560/32561	1.54/1.39
Pleuroscopy	32601	5.50
Tracheostomy	31600	7.17
Whole-lung lavage	32997	7.31
Pleuroscopy with pleurodesis	32650	10.83
New Codes for Emerging Procedures <sup>25</sup>		
Bronchial valves	31647	4.40
Bronchial thermoplasty	31660	4.25
Supplementary Codes		
Fluoro for Bronch	76496	0.00
Ultrasound guidance	76604	0.55
Moderate sedation	99144-99150	0.00

**Abbreviations:** BAL, bronchial alveolar lavage; Bronch, bronchoscopy; EBBx, endobronchial biopsy; EBUS, endobronchial ultrasound; ENB, Electronavigational bronchoscopy; FB, foreign body; TBBx, transbronchial biopsy; TBNA, transbronchial needle aspiration.

their accompanying work RVUs for pulmonary procedures. A comprehensive list and explanation of CPT billing codes for all pulmonary and critical care procedures are available from the American College of Chest Physicians.<sup>26</sup>

**Modifiers to CPT Codes**

A 2-digit modifier code may be added to the stem CPT code to indicate that a procedure was unusual, prolonged, or required some additional service or activity.

The modifier must be supported by documentation in the medical record of the specific circumstances that made the procedure nonstandard. Applying the modifier code will typically lead

to higher reimbursement for that particular procedure.

There are 2 types of modifiers: level I, that are 2-digit numerical codes applied to the CPT codes issued by the AMA, and level II, that are alpha-numeric codes applied to the Healthcare Common Procedure Coding System (HCPCS) codes issued by CMS.<sup>24</sup> The most common level I modifier codes used by interventional pulmonologists are listed in **Table 3** and include “25” for a “separately identifiable evaluation and management service by the same physician on the same day of the procedure or other service”; this may be applied when the IP physician performs an evaluation and management (E&M) on a patient on the same day that an IP procedure is performed. The modifier is

Table 3 Common CPT code level I modifiers used in interventional pulmonology		
Common CPT Code Level I Modifiers Used in Interventional Pulmonology		
Modifier	Technical Description	Common Scenario for Use
22	Unusual Procedural Service	
25	Significant, separately identifiable evaluation and management service by the same physician on the same day of the procedure or other service	Initial patient evaluation in clinic followed by an interventional procedure on the same day
50	Bilateral procedure	Simultaneous bilateral thoracentesis
51	Multiple procedures	Thoracentesis followed by chest tube
53	Discontinued procedure	Unsuccessful procedure aborted for safety
57	Decision for surgery	Findings during IP procedure lead to plan to refer for surgery
58	Staged or related procedure or service by the same physician during the postoperative period	Conversion from one type of chest tube to another or pleuroscopy followed by chest tube placement
59	Distinct procedural service	Thoracentesis and bronchoscopy on the same day
73	Discontinued outpatient hospital/ambulatory surgery center procedure before the administration of anesthesia	Patient arrives in ambulatory surgery center procedural center for planned procedure but reveals she has taken aspirin and Plavix that day and procedure is canceled before starting but after setting up
76/77	Repeat procedure by same/another physician	Second attempt at thoracentesis by IP physician after another physician's failed attempt
78	Return to the OR for a related procedure during the postoperative period	Return for adjustment of tracheal stent that has migrated
79	Unrelated procedure or service by the same physician during the postoperative period	Bronchoscopy for staging at one time followed by thoracentesis for relief of effusion at another time
AF	Specialty physician	When IP physician performs a procedure that a physician with less specialized training may also be qualified to perform but data support better outcomes with additional training



added to the E&M code rather than to the procedural code, which is important because the modifier increases the likelihood that both the E&M and the procedure will be reimbursed. The modifier does not guarantee full reimbursement; rather the most reliable strategy is to separate the clinical evaluation from the procedure by 2 business days such that the payer sees these as separate episodes of care. Other useful modifiers in IP practice include “51” for “multiple procedures” if, for example, an initial thoracentesis reveals an empyema and a subsequent chest tube placed the same day; or “57,” “decision for surgery,” which may be used if an initial thoracentesis reveals a highly loculated effusion and the patient then proceeds to thoracoscopy. The most commonly used level II code used by interventional pulmonologists is likely to be “AF” for specialty physician.

### ***Documentation to Support Procedural Billing***

All procedures performed by the interventional pulmonologist must be documented in detail in the medical record, including descriptions of usual circumstances or findings to justify any modifiers that are used.

Payment for image guidance for procedures, such as use of ultrasound for thoracentesis or endobronchial ultrasound for TBNA, requires the IP physician to save the image used to guide the procedure in the medical record. The electronic medical record used by the IP physician should have the capabilities to record, store, and retrieve those images. In addition, when performing procedures with add-on CPT codes, such as TBNA for multiple nodal stations, the aspiration of discreet nodes at multiple levels and the actual nodes sampled must be identified in the procedure report.

### ***Applying for a New CPT Code for a New or Modified Procedure***

CPT codes are updated each year by the AMA CPT Editorial Panel, which consists of CPT/HCPAC advisors.<sup>24</sup> New codes are added each year, especially in evolving fields like interventional pulmonology, but it may take several years from the introduction of a new technology in the clinical arena before it is recognized by the AMA CPT Editorial Panel.<sup>27</sup>

Individuals requesting CPT code modifications must submit applications along with supporting materials to the Editorial Panel at least 30 days before the annual meeting to be considered for inclusion in the following year's CPT Code book. Lobbying in the form of direct communication with CPT/HCPAC advisors on behalf of a code

change request is not allowed. A detailed description of the application process is available on the AMA's web site.<sup>28</sup>

In order for a new CPT code to be approved, the procedure must meet certain fundamental criteria. It must be approved by the FDA; represent a distinct service that is not already available under a different CPT code or simply be a modification of an existing CPT code; be in widespread use across the United States; and its clinical efficacy must be documented in the peer-reviewed literature. An application to the AMA Editorial Panel for review of a proposed new CPT code must include (1) an executive summary of a literature review including at least 5 references, (2) financial disclosures, (3) review of available data on safety of the proposed procedure, (4) a complete CPT application packet, (5) data on physician work load and practice expenses related to the proposed procedure, (6) prices for supplies and devices, including invoices, and (7) references for those qualified to review the data on behalf of the panel.

### **SUMMARY**

Future changes are inevitable in the funding and reimbursement arrangements discussed in this article. For those interested in establishing, expanding or optimizing their interventional pulmonology practice, understanding and effectively using the current systems of reimbursement are critical. However, it will also be imperative for IP practices to be nimble and adapt to the changing landscape of medical need, legislative mandates, and reimbursement policy. Interventional pulmonologists are regularly asked to perform more complicated and advanced procedures, but the reimbursement for time, effort, and skill involved in these procedures has not kept up with reimbursement for other procedural specialties.<sup>29,30</sup> In fact, in areas such as endobronchial ultrasound, reimbursement has decreased over the past several years.

The Affordable Care Act (ACA), passed in 2010 and currently under review in Congress, promises to introduce new incentives for quality and efficiency by rewarding quality outcomes. Much remains to be seen about how the ACA will affect interventional pulmonology, and many changes can be expected to the law before it is finally implemented.<sup>31</sup> It is expected, for example, that the ACA could benefit “interventionalists” through quality incentives for achieving better outcomes for the procedures they are highly trained to perform, as has been anticipated with the use of intensivist staffing of intensive care units.<sup>32</sup> On

the other hand, IP procedures are inherently complex and commonly performed in very sick patients with advanced cancer or end-stage pulmonary disease. One could imagine that the disincentives proposed by the ACA for poor outcomes, complications, and readmissions may discourage interventional pulmonologists from caring for those in greatest need of palliation. On the other hand, it may also result in greater scrutiny and decrease “futile” procedures (ie, those done “just because you can and not because it is the right thing for the patient”). The addition of quality metrics may at some point also bring to light the additional liability of an interventional pulmonary practice, having the potential to in turn impact on professional responsibility premiums, further influencing revenue generation.

As the ACA comes on board in the next several years and introduces new incentives for quality and efficiency, interventional pulmonologists will want to be poised to capitalize on these incentives. Understanding the current landscape of the business of interventional pulmonology is crucial to ensure appropriate preparation and involvement in the direction of the future of the field.

## REFERENCES

1. Frostin P. Sources of health insurance and characteristics of the uninsured: analysis of the March 2012 current population survey. *EBRI Issue Brief* 2012;(376):1–34.
2. Peele P. Employer-sponsored health insurance: are employers good agents for their employees? *Milbank Q* 2000;78(1):5–21.
3. Gabel J. Job-based health insurance in 2000: premiums rise sharply while coverage grows. *Health Aff* 2000;19(5):144–51.
4. Gabel J. Withering on the vine: the decline of indemnity health insurance. *Health Aff* 2000;19(5):152–7.
5. Iglehart J. The struggle between managed care and fee-for-service practice. *N Engl J Med* 1994;331(1):63–7.
6. Weiner JP, de Lissovoy G. Razing a tower of Babel: a taxonomy for managed care and health insurance plans. *J Health Polit Policy Law* 1993;18(1):75–103.
7. Baker LC. Association of managed care market share and health expenditures for fee-for-service medicare patients. *J Am Med Assoc* 1999;281(5):432–7.
8. Baker LC. The effect of HMOs on fee-for-service health care expenditures: evidence from Medicare. *J Health Econ* 1997;16:453–81.
9. Rosenbaum S. Medicaid and national health care reform. *N Engl J Med* 2009;361:2009–12.
10. Silvestri GA, Handy J, Lackland D, et al. Specialists achieve better outcomes than generalists for lung cancer surgery. *Chest* 1998;114(3):675–80.
11. Yarmus L, Pandian V, Gilbert C, et al. Safety and efficiency of interventional pulmonologists performing percutaneous tracheostomy. *Respiration* 2012;84:123–7.
12. Mirski MA, Pandian V, Bhatti N, et al. Safety, efficacy, and cost-effectiveness of a multidisciplinary percutaneous tracheostomy program. *Crit Care Med* 2012;40:1827–34.
13. Rittenhouse DR, Shortell SM. The patient-centered medical home: will it stand the test of health reform? *J Am Med Assoc* 2009;301(19):2038–40.
14. Rosenthal TC. The medical home: growing evidence to support a new approach to primary care. *J Am Board Fam Med* 2008;21(5):427–40.
15. Fisher ES. Building a medical neighborhood for the medical home. *N Engl J Med* 2008;359(12):1202–5.
16. Ginsburg PB. Spending to save – ACOs and the Medicare shared savings program. *N Engl J Med* 2011;364:2085–6.
17. Ho C, Clark M, Argaez C. Endobronchial ultrasound for lung cancer diagnosis and staging: a review of the clinical and cost-effectiveness. Ottawa (Canada): Canadian Agency for Drugs and Technologies in Health; 2009.
18. Kunst P, Eberhardt R, Herth F, et al. Combined EBUS real time TBNA and conventional TBNA are the most cost-effective means of lymph node staging. *J Bronchol* 2008;15:17–20.
19. Harewood GC, Pascual J, Raimondo M, et al. Economic analysis of combined endoscopic and endobronchial ultrasound in the evaluation of patients with suspected non-small cell lung cancer. *Lung Cancer* 2010;67:366–71.
20. Steinfort D, Liew D, Conron M, et al. Cost-benefit of minimally invasive staging of non-small cell lung cancer: a decision tree sensitivity analysis. *J Thorac Oncol* 2010;5(10):1564–70.
21. Medford A, Agrawal S, Free C, et al. A performance and theoretical costs analysis of endobronchial ultrasound-guided transbronchial needle aspiration in a UK tertiary respiratory centre. *QJM* 2009;102:859–64.
22. Pastis N, Simkovich S, Silvestri G. Understanding the economic impact of introducing a new procedure: calculating downstream revenue of endobronchial ultrasound with transbronchial needle aspiration as a model. *Chest* 2012;141(2):506–12.
23. Dummit LA. The Basics: Relative Value Units (RVUs). Policy Brief. George Washington University: The National Health Policy Forum; 2009.
24. Available at: <http://www.cms.gov/Medicare/Coding/MedHPCSGenInfo/>. Accessed July 9, 2013.



25. Alan Plummer L. Coding & billing Quarterly. New York, NY: American Thoracic Society; 2012.
26. ACCP. Coding for chest medicine, 2013. Northbrook, IL: American College of Chest Physicians; 2013.
27. Edell E, Krier-Morrow D. Navigational bronchoscopy: overview of technology and practical considerations – new current procedural terminology codes effective 2010. *Chest* 2010;137(2):450–4.
28. Applying for CPT Codes. Available at: <http://www.ama-assn.org/ama/pub/physician-resources/solutions-managing-your-practice/coding-billing-insurance/cpt.page>. Accessed July 9, 2013.
29. Kovitz KL. From the president of the American Association of Bronchology, the future of interventional pulmonology. *J Bronchol* 2006;13(3):107–8.
30. Manaker S, Ernst A, Marcus L. Affording endobronchial ultrasound. *Chest* 2008;133(4):842–3.
31. McDonough JE. The road ahead for the Affordable Care Act. *N Engl J Med* 2012; 367(3):199–201.
32. Logani S, Green A, Gasperino J. Benefits of high-intensity intensive care unit physician staffing under the Affordable Care Act. *Crit Care Res Pract* 2011; 2011:170814.