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Index terms:
Cost-effectiveness
Radiology and radiologists, departmental management
Radiology reporting systems

Radiology 2001; 220:7–11

Abbreviations:
CPT = Current Procedural Terminology
ICD = International Classification of Diseases
S & I = supervision and interpretation

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Coding and Reimbursement Issues for the Radiologist[1]

Radiologists are dependent on the proper execution of a complex administrative chain of disease and diagnosis coding and procedural coding to be properly reimbursed for the examinations they perform. The radiologist bears the ultimate responsibility for the appropriateness of these codes. However, many practicing radiologists are unaware of the critical link between the two coding systems and the systems that have developed to provide a common method of describing diseases, diagnoses, and procedures. This article is an introduction to these systems, and it emphasizes the importance of the involvement of the radiologist in coding. The inherent complexity of the reimbursement system in use is emphasized, as well as the essential role of the radiologist in complying with these often complicated and ever-changing directives.

Organizing and managing a successful radiology department has become more complex and technical than in the past partly because of the greater complexity in the physician reimbursement system that has placed new demands on radiologists and departmental administrators. The difference between a radiologist's charges and what is collected has widened. Specifically, the contracted and discounted fee for service and the bundled payment schemes such as capitation have reduced the payment per unit of service. Insurers have grown more aggressive (some would say more passive-aggressive) in developing strategies to reduce what they have to pay. Payment is frequently delayed for bills that are submitted in good faith by radiologists (1). Radiologists' charges may be returned for clarification or requests for additional clinical information, or they may be rejected for reasons that are often unclear. These trends are likely to continue as payers seek to reduce their medical-loss ratio (the amount paid for medical services divided by all costs, including medical services, administration, capital, and return to investors) (2). Hence, it is essential to manage the finances of the department to minimize the loss of collectable revenue.

Issues on which radiology departments can focus to improve their collections include proper patient registration, insurance verification, and, more important, appropriate coding of completed examinations. The last of these issues, correct coding, is probably the most arcane. To make matters worse, the rules governing coding are constantly changing. A submitted claim must clearly reflect, by means of the attached codes, what was done and why it was done, and it must meet the payer's expectations that the two are appropriately and plausibly related. The purpose of this special review is to set forth principles that govern coding to help radiologists understand the coding system and improve the success of their claims submissions.

The best means to arrive at a consistent description of a radiologic procedure or examination is shared terminology. For these procedures, the *Current Procedural Terminology* (CPT) manual (3) is the reference. Similarly, the description of a disease process must be consistent to allow coding of a diagnosis that may necessitate a radiologic procedure or examination. The system used to discuss the disease processes is the International Classification of Diseases (ICD). The following sections will discuss the importance of the CPT and ICD systems, the reason why physicians should be familiar with both, and the utilization of these manuals to ensure optimal coding.

THE CPT SYSTEM

Coding of an imaging procedure requires the provision of one or more procedural (CPT) codes and one or more diagnostic (ninth revision of ICD) codes (4). The CPT handbook is

a descriptive listing of various procedures that are performed by physicians. The CPT manual first appeared in 1966; it was instituted as the result of a proposal by the American Medical Association to provide a precise and uniform means for physicians to describe their work to their colleagues, patients, and third parties (ie, payers) (5).

The use of a common language to describe procedures in the manual serves an important role. Within the scope of this discussion, the uniformity of the descriptors facilitates the detailing of billing information to payers who want services or procedures performed by physicians to be easily categorized rather than buried in procedural notes. The CPT manual also makes possible the automated collection and analysis of procedural data for purposes of tracking and review.

The CPT system of manual and codes is one characterized by ongoing development. The American Medical Association maintains a committee to maintain and update the CPT manual (6). This committee is composed of physicians who receive advice and contributions from members of associated insurance and regulatory agencies. The committee makeup is included in each update of the manual. Annual publications have been issued (6). Radiology traditionally has been represented on the committee and has benefited from the development and incorporation of multiple new listings in the CPT manual in recent years. Advances in imaging technology have necessitated constant input from radiologists to ensure that these new techniques are reflected in the CPT codes, a necessary prerequisite to their being covered in reimbursement systems. Some lag in the incorporation of these new codes is inevitable.

The CPT manual identifies each procedure or professional service with a five-digit code. It is beyond the scope of this discussion to cover the vast range of medical and surgical codes. However, as already intimated, to improve reimbursement for submitted claims, it is of critical importance that practicing physicians understand the system. A few simple examples may clarify the use of the CPT coding system.

Imagine that a radiologist is interpreting lumbar spine radiographs obtained in a patient. The radiographs consist of one anteroposterior, one lateral, and two oblique views. By turning to the radiology section of the CPT manual (codes 70010–79999) and moving to the "Spine and Pelvis" subsection, one notes that there are multiple choices of codes listed for lumbar spine examinations. One such example is CPT code 72110, which includes "Radiologic examination, spine, lumbosacral; complete, with oblique views." In the CPT manual, "complete, with oblique views" is cited on the second line and indented. This CPT code precisely defines the service and should be selected. The style for entering codes in the CPT manual needs some clarification. When an entry is followed by an indentation, as in this case, and a partial descriptor is supplied below a major descriptor, the semicolon in the major descriptor defines the beginning of the complete service description. In this example, "Radiologic examination, spine, lumbosacral;" is obtained from the listing for CPT code 72100 that appears above the correct listing.

To find an exact listing in the CPT manual, as in the example just discussed, the examination must be a procedure or service that is consistent with current medical practice, and it must be performed by many physicians in practice in many locations. The exact match must be sought. However, when the examination performed does not exactly match an examination listed in the CPT manual, the closest match must be sought. Matching codes to a less complex examination than what actually was performed generally results in lesser reimbursement. However, there is a danger in coding a more complex examination than that actually performed. If "upcoding" (coding a higher or more complex level of service than that actually provided) is discovered during an insurer's audit, it will likely be viewed as abuse or perhaps even fraud (discussed later).

In addition to the basic examination codes, there is a set of codes used to modify the five-digit listing that is also critical to coding radiology services. In the example just discussed, the service coded has both professional and technical components. In billing only for the radiologist's service, the modifier -26 is used so that if the technical component is being billed by a hospital, the correct and complete code for the professional services is 72110-26. In the examples in this article, both systems may be used. Other important modifiers are provided to reduce or increase the extent of a service or procedure (which may alter the eventual payment); to allow billing of only a part of the service or procedure, adjunctive services, bilateral procedures; or to denote the occurrence of unusual or unexpected events.

Invasive procedures that are performed by radiologists require yet another level of complexity for proper coding. The radiologic component of a procedure is referred to as radiologic supervision and interpretation, or S & I. There is also a procedural or surgical component. The radiologic and procedural components are coded separately. For example, a radiologist obtains a lumbar myelogram in a patient with back pain and radiculopathy. The radiographs are preceded by the procedure, which is a critical element of the final diagnostic examination. The injection procedure is coded after consulting the CPT manual and finding that the best match is CPT code 62284, "Injection procedure for myelography and/or computerized axial tomography, spinal (other than C1-C2 and posterior fossa)." The myelograms are coded as CPT code 72265, "Myelography, lumbosacral, radiological supervision and interpretation." If a computed tomographic study accompanies the myelogram, it is also coded as an additional radiologic S & I. Again, the -26 modifier may be appropriate for this code, depending on the billing arrangement. Adding the -26 modifier bills only the professional component without the technical component.

Transcatheter arterial and interventional procedures add still further complexity. Largely founded on the efforts of the Society of Cardiovascular & Interventional Radiology, a system for coding selective arterial procedures based on the branch order of the catheterized vessel is in wide acceptance. The Society of Cardiovascular & Interventional Radiology has published a useful manual (7) to detail the specifics of interventional radiologic coding. Each vascular family (each with a separate origin from the aorta) is coded separately. For selective catheter placement, the coding is applied to the highest order or the most distal branch that a catheter reaches in the designated vascular family. Selective catheter placement implies that the catheter was advanced and manipulated beyond the punctured vessel and aorta.

Each catheter placed and imaged represents another procedural and S & I step. Each separate procedure justifies an additional CPT code. An individual radiologic "S&I" code is also applied to each accompanying set of radiographs. The addition of a therapeutic interventional procedure to the diagnostic procedure introduces additional coding. Codes must be added for the entire diagnostic procedure, the subsequent therapeutic interventional procedure, and radiographs obtained during

the course of the procedure to obtain full reimbursement for the procedure.

For example, a radiologist obtains a diagnostic angiogram of the abdominal aorta and bilateral selective renal arteriograms with a femoral approach. The codes should be CPT 75724, "Angiography, renal, bilateral, selective (including flush aortogram), radiological supervision and interpretation" and CPT 36245-RT and 36245-LT, "Selective catheter placement, arterial system; each first order abdominal, pelvic, or lower extremity artery branch, within a vascular family." The modifiers RT and LT identify the right and left renal arteries, respectively. The aortogram cannot be coded as a separate supervision and interpretation code, since the 75724 code is somewhat unusual because it plainly states that the flush aortogram is an element of renal angiography. If a stenosis of one renal artery is subsequently treated by means of a balloon angioplasty, the additional codes 35471 (RT or LT) + 75966 (procedural code for renal or visceral artery angioplasty + radiology S & I for initial visceral artery angioplasty) are added. CPT codes exist for all vascular and nonvascular interventions, such as embolization, angioplasty, stent placement, and thrombolysis.

ICD-9 CODING

Accurate diagnostic coding of the disease process that is the rationale for the radiologic examination is also a critical element of the reimbursement process. ICD, the system for classifying diseases, was developed under the auspices of the World Health Organization, with the cooperation of the American Medical Association. The current revision is the ninth and is thus referred to as the ICD-9 (4). The list of the disease processes is supplied both in an alphabetic index and a table. The Health Care Financing Administration has established guidelines for the coding of diseases, using the ICD-9 system, to allow uniformity of coding practices. Disease processes are categorized according to organ system and also into broad categories of disease states with three-digit codes that can be modified as needed by the inclusion of fourth or fifth digits as characters following a decimal point. All payers place considerable emphasis on coding to the highest known degree of specificity (ie, the symptoms or disease codes most closely approximating the patient's presentation).

Large segments of the ICD-9 text deal with symptoms and signs, as well as injuries, accidents, late effects of known disease states, and complications. It is important for radiologists to realize that it is not permissible to code a suspected diagnosis (ie, rule out, suspicion of); in such cases, payment will usually be denied (8). The coding can be applied only to the items that are known. A disease may be highly suspected, but until it is proved to a reasonable certainty, only the symptoms may be coded. For example, a patient is seen by a physician and is referred for sinus radiography. The patient is complaining of facial pain, purulent nasal discharge, and fever. There is some tenderness over the maxilla, and maxillary sinusitis is suspected. It is not known as fact, however. Thus, the ICD-9 codes that should be applied initially are 784.0, facial pain; 478.1, other diseases of the nasal cavity and sinuses (discharge); and 780.6, fever. However, if maxillary sinusitis is diagnosed with subsequent radiographs, the postprocedural secondary diagnosis code, 461.0, maxillary sinusitis, is appropriate.

In much the same fashion as the application of a postoperative diagnosis by a surgeon, the radiologic coding may apply a postprocedural or postradiographic diagnosis. A personal history of a disease process that is not known to be currently present is not coded as the disease process itself but as the appropriate V code. A wide range of V codes exist for both personal and family histories of diseases, existing conditions that influence health status (such as ostomies or implanted medical devices), and a range of other indications for health care encounters.

E codes, such as E828, "Accident involving animal being ridden" exist to describe the range of external influences of both injury and poisoning to great specificity. This code includes a fall from an animal being ridden but not a collision involving an animal-drawn vehicle and a post, which would be coded as E827, "Animal-drawn vehicle accident."

THE RATIONALE FOR UNDERSTANDING CODING

Radiologists should be intimately familiar with the complexities of the CPT and the ICD-9 coding systems. Their utilization as a classification system for patients, disease processes, services, and as a means of communicating this information to third parties is obviously important. To obtain reimbursement, the radiologist must link ICD-9 diagnostic codes with plausible CPT codes to prove medical necessity (the critical precondition for reimbursement). The premise is simple enough: A procedure with given CPT code will be reimbursed if it is accompanied by an ICD-9 code obtained from a preconceived list of appropriate indications for that procedure. The radiologist can bill according to the procedural code, and the procedure will be viewed as of medical necessity for the treatment of a patient and subsequently reimbursed if it is supported by documentation that a given ICD-9 code was the reason for ordering the procedure.

The assignment of ICD-9 codes to a reimbursable status for a given CPT code is a function of the payers' internal operations. For example, local Medicare carriers maintain Carrier Advisory Committees, which are composed of physicians representing multiple medical specialties who meet regularly with the regional medical directors of Medicare to propose and justify the inclusion of diagnosis codes to be linked to procedural codes (9). Physicians should be aware of their representation on these committees and of the upcoming discussions that concern their specialty, and they should provide assistance to their representatives on the Carrier Advisory Committees in areas relevant to their expertise.

Medicare and some third-party payers supply lists of supporting ICD-9 codes for procedures. In Virginia, the Medicare carrier and the Health Care Financing Administration maintain a Web site that lists diagnosis codes linked to acceptable (ie, reimbursable) CPT codes (10). Carriers in other states maintain similar sites or regularly issue printed lists. Hence, the uninitiated physician might think that simple attention to this list would ensure payment for procedures: Just find an appropriate indication for the procedure and bill it. However, with the increasing vigilance of third-party payers (notably Medicare) regarding fraud and abuse, this is a strategy fraught with hazard. If knowledge of these matches leads to the application of a reimbursable code without documentation, this knowledge could lead to conviction for fraud or abuse.

Fraud and abuse in the reimbursement system have been widespread. The federal government has identified fraud and abuse in the Medicare system, and it is a target for an expanding investigation that has been ongoing for several years. Indeed, health care fraud has been elevated to the near-pinnacle of the Department of Justice priority list (11), just behind organized crime. The government estimate of improper Medicare payments

in the fiscal year 1997 was more than $20 billion (12). In 1998, due largely to an increased emphasis on the identification and prosecution of fraud and abuse cases, the government estimate of improper Medicare payments was reduced to $12.6 billion (or 7.1% of Medicare total fee-for-service spending) (12). Of concern to many physician groups has been the government recruitment of community-based groups and the American Association of Retired Persons to provide training to segments of the population, notably seniors, to detect waste, fraud, and abuse in medical services (13,14).

What exactly is fraud and abuse in medical reimbursement? Fraud refers to the practice of intentional or systematic inappropriate billing to cheat a payer. The areas of fraud most commonly identified by the Department of Justice include billing for services not rendered, billing for services not medically necessary, double billing, upcoding, unbundling (using multiple codes rather than a single code as a means of obtaining greater reimbursement), and fraudulent cost reporting by institutional providers (11). Fraud would seem to be a problem of limited scope, but it is a serious offense and punishable not only with fines but also with imprisonment. The Department of Justice maintains a current list of convicted health care fraud persons on its Web site (14).

Abuse refers to the use of inappropriate—nonintentional but nonetheless incorrect—billing practices. Abuse is more insidious. Coding must be performed accurately, with appropriate documentation at all stages, to prevent abuse. Simple, easily preventable errors, such as billing from an out-of-date CPT or ICD-9 manual, can lead to incorrect coding and charges of abuse. Auditors could view repetitive mistakes as abuse, if not fraud. High-risk practices include billing for services not rendered, incompletely documenting reports, or billing for services that are not medically necessary.

The key role of documentation is clear, and a thorough understanding by all practicing radiologists of the importance of proper documentation is a high priority. Complete documentation is critical to compliance with current Medicare regulations and to obtaining appropriate reimbursement from other payers. In Medicare reviews performed by the Office of the Inspector General, incomplete documentation or lack of documentation has been shown to be the single most common reason for payment errors. The position of third-party payers is clear: If you did not document it, you did not do it.

We as radiologists must realize that our reports are our most important source of documentation for purposes of demonstrating adequate cause for reimbursement. The American College of Radiology *Standard for Communication* (15) provides guidance in this regard. Radiologic reports must clearly state the clinical data leading to the performance of the examination, a precise description of the examination by using CPT terms whenever possible, a thorough procedural and/or technical note for interventional procedures, and a clear impression of the diagnosis.

In reviewing documentation, the radiologist should remember that the rationale for each examination must stand alone. Since radiologists are frequently dependent on referring clinicians to supply this rationale, they must establish effective means for obtaining this information. Since rule-out diagnoses are insufficient and coding to the highest level of specificity of what is known is required, information about symptoms must be obtained from the referring physician, patient, technologist, or radiologist. The appropriateness of the radiologist or a representative gathering this information seems clear, but this is a matter that should best also be approved by a representative of the insurance agencies. We have asked the medical director of our regional Medicare agency for approval to gather additional clinical data, and this request was granted.

The American College of Radiology has identified compliance and documentation as crucial issues for radiologists and has advocated in-service training for radiologists and administrative staff. It has developed guidelines for compliance, most notably its mock compliance document (16). To prevent problems, radiologists should familiarize themselves with the CPT and ICD-9 texts in detail and understand the link between diagnosis and procedural codes. Regularly scheduled reviews of coding practices, both to optimize reimbursement and to ensure that practices are operating within legal limits, are desirable. Continuing education of coders and physicians in compliance with current coding practices is important as well. The complexity and fluidity of the current system requires nothing less than constant attention.

ESTABLISHING AND MAINTAINING OPTIMAL CODING PRACTICES

Many institutions and practices have developed systems to code radiologic services and procedures. The simplest but perhaps most demanding of these systems makes the radiologist responsible for coding each examination. Since the physician is ultimately responsible for the codes applied, some would argue that this is the most logical and appropriate scheme. However, coding is a time-intensive task and requires the radiologist to keep up with not only professional and administrative tasks already at hand, but also the growth of technologic advances and the frequent modifications to the CPT and ICD-9 manuals.

A modification that can ease some of the strain and reduce the required level of expertise with this system is the provision of procedural and diagnostic worksheets on which the radiologist can select codes at the time of the procedure. However, this practice ultimately requires additional clerical services to translate this information into billable codes.

Many practices hire professional coders to determine final codes by reviewing the radiologic reports. With this approach, the examinations are typically coded after the completion of the report. The coder reviews the description of the examination that was performed and documented in the report. He or she then assigns CPT and ICD-9 codes on the basis of the radiologist's findings and/or the clinical information provided. The advantages of this system include the reduction in physician workload and the greater expertise afforded by professional coders who are trained and up-to-date with the complexities of the coding system. The coder can also effectively act in the role of an auditor, working with the same information that a third-party auditor would have. The obvious disadvantage of the system is the separation of the physician (who is ultimately responsible) and the billing. If the physician is not actively involved in the system, errors that may prove costly or even devastating to a practice might go unrecognized.

Another option is the system that we have adopted. In our modification to the second approach, professional coders perform the day-to-day coding with the direction of a physician who has additional training, expertise, and responsibilities in coding and reimbursement issues. The time commitment of this position obviously depends on the volume of a practice, the skill level of the coders, and the extent of physician involvement. In our case, this has represented a few hours a week of review and education sessions for the staff and residents. This physician is able to review the

entire system and develop strategies to improve the coding and billing scheme.

Draconian measures are likely unnecessary in departments that have been compliant with developing coding and reimbursement initiatives. However, we have found that careful attention to certain areas, such as substantial losses with interventional procedures due to coding errors, or to the selection of more appropriate (although perhaps not consistently selected ICD-9 or CPT codes) can provide substantial gains. The physician can also answer questions of a clinical nature from the coders and distill clinical information into appropriate ICD-9 codes. This physician can also involve himself or herself with the physician referral base and educate them on the importance of providing appropriate clinical information, preauthorization, and level of appropriateness of examinations.

This involvement with other clinical services is not entirely self-serving. While these issues directly affect the bottom line for the radiologists, they also affect the financial health of the entire hospital organization and influence the imaging of the individual patient. An interested physician can obtain training in coding by attending courses about CPT and ICD-9 issues (such as those provided by the Radiology Business Management Association and the American Healthcare Radiology Administrators), reading, consulting with professional coders, and being involved in these issues on a routine basis. In our case, the physician providing the coding and reimbursement oversight is also involved in the Carrier Advisory Committees issues and develops relationships with multiple insurers. Additionally, in a training institution, this physician can serve as the first point of reference for resident and fellow training in compliance issues. The importance of these issues has become paramount in adhering to an ever-changing environment of reimbursement.

With either the physician or coder-based approach, a positive study finding simplifies the application of an appropriate ICD-9 code. Study results that are normal or without substantial findings can be coded only with the supplied clinical information or additional information gathered prior to or at the time of the examination. Positive study findings, on the other hand, allow the coder to refine the diagnosis. For example, a chest radiograph obtained to evaluate chest pain without a substantial finding can be coded only with ICD-9 code 786.50, or "chest pain, unspecified," which may not be a reimbursable ICD-9 code. The finding of a pneumothorax allows specific coding of the secondary diagnosis (the primary diagnosis remains "chest pain") of "pneumothorax," or ICD-9 code 512, which typically allows reimbursement.

Coding support is available in the form of computer software. These programs evaluate entered data and are capable of performing complex reviews of the report to apply the most appropriate CPT and ICD-9 codes or to check the performance of the physician or coder. Thus, the software reviews the appropriateness of the examination on the basis of clinical information, and it can be configured to compare the examination with insurers' lists of examinations of medical necessity. These software packages are variable in price, but with increasing technical sophistication, they can cost tens of thousands of dollars. They still require monitoring, as well. We have used a software system (ENCODER PRO; Medicode, Salt Lake City, Utah) that can be custom-configured to make it more user-friendly; it operates essentially as a rapid, key word–directed ICD-9 system, Health Care Common Procedure Coding System, or CPT manual index. A recent article (17) described the application of an inexpensive networked database for ICD-9 coding.

SUMMARY

With regard to coding, the radiologist is caught between two perils. If he or she codes inappropriately or fails to fully detail what was done, there is the risk of receiving insufficient reimbursement; if the codes overstate the case, there is the risk of abuse, and repayments and fines may result. Both can be prevented with assiduous attention to detail, detailed knowledge of the coding system, application of basic coding principles, and thorough documentation.

Acknowledgments: The authors acknowledge the excellent secretarial assistance of Sherry Deane and the kind assistance of Greg Strickland and E. David Perez, MD.

References

1. Klein SA. Class action filed to secure prompt pay. American Medical News 2000; Mar 6:5,8.
2. Jacob JA. Most health insurers posted strong earnings last year. American Medical News 2000; Mar 13:20.
3. American Medical Association. Current procedural terminology (CPT 2000). Chicago, Ill: American Medical Association, 1999.
4. ICD-9-CM: international classification of diseases 9th revision, clinical modification fifth edition. Los Angeles, Calif: PMIC, 1997.
5. American Medical Association. Chronology of AMA history 1960 to 1979. Available at: *www.ama-assn.org/about/60-79.htm*. Accessed April 23, 2001.
6. American Medical Association. CPT process. Available at: *www.ama-assn.org/ama/pub/category/3113.html*. Accessed April 23, 2001.
7. American College of Radiology, Society of Cardiovascular and Interventional Radiology, Radiology Business Management Association, and American Healthcare Radiology Administrators. Interventional radiology coding users' guide. 5th ed. Reston, Va: American College of Radiology, 1999.
8. Medicare Carrier's Manual Version 01-90, Section 4020.3, page 4-20.1B. ACR Hotline May-June 1998; 2.
9. Local Medical Policy and the Carrier Advisory Committee. Available at: *www.themedicare.com/va/pcac.asp*. Accessed April 23, 2001.
10. Trailblazer Health Enterprises, LLC. Medicare Part B Virginia LMRP's. Available at: *www.the-medicare.com/lmrp/va.asp*. Accessed April 23, 2001.
11. United States Department of Justice. Health Care Fraud Report fiscal year 1998. Available at: *www.usdoj.gov/dag/pubdoc/health98.htm*. Accessed April 23, 2001.
12. United States General Accounting Office. Report on Medicare (GAO/HR-91-10), February 1997. Washington, DC: United States General Accounting Office, 1997.
13. Department of Health and Human Services. Dollars lost to fraud. Available at: *www.dhhs.gov/progorg/oei/outreach/aoaweb.htm*. Accessed November 22, 1999.
14. The Official U.S. Government Site for Medicare Information. Fraud and abuse. Available at: *www.medicare.gov/fraudabuse/overview.asp*. Accessed April 23, 2001.
15. American College of Radiology. ACR Standards. Available at: *www.acr.org/frames/f.publications.ht*. Accessed April 27, 2001.
16. American College of Radiology. Compliance program guidelines for radiologists and radiation oncologists. Reston, Va: American College of Radiology, 1999.
17. Sistrom C, Drane W. Networked ICD-9 coding system for a radiology department. AJR Am J Roentgenol 2001; 176: 335–339.