

Nuclear Medicine: Radionuclide Bone Imaging
Physician Performance Measurement Set

Approved by the PCPI

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Physician Performance Measures (Measures) and related data specifications, developed by the Physician Consortium for Performance Improvement® (the Consortium), are intended to facilitate quality improvement activities by physicians.

These Measures are intended to assist physicians in enhancing quality of care. Measures are designed for use by any physician who manages the care of a patient for a specific condition or for prevention. These performance Measures are not clinical guidelines and do not establish a standard of medical care. The Consortium has not tested its Measures for all potential applications. The Consortium encourages the testing and evaluation of its Measures.

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Purpose of Measures:

These clinical performance measures, developed by the Society of Nuclear Medicine (SNM) and the Physician Consortium for Performance Improvement® (Consortium), and are designed for individual quality improvement. Unless otherwise indicated, the measures are also appropriate for accountability if appropriate methodological, statistical, and implementation rules are achieved.

Accountability Measures:

Measure #1: Correlation With Existing Imaging Studies for All Patients Undergoing Bone Scintigraphy

Measure #2: Communication to Referring Physician of Patient's Potential Risk for Fracture for All Patients Undergoing Bone Scintigraphy

Intended Audience and Patient Population:

These measures are designed for use by physicians and for calculating reporting or performance measurement at the individual physician level. When existing hospital-level or plan-level measures are available for the same measurement topics, the Consortium attempts to harmonize the measures to the extent feasible.

These measures are designed for physicians directing or performing the selected imaging examinations.

The Consortium also encourages the use of these measures by other health care professionals, where appropriate.

Measure Specifications

The Consortium seeks to specify measures for implementation using multiple data sources, including paper medical record, administrative (claims) data, and particular emphasis on Electronic Health Record Systems (EHRS). Draft specifications to report on these measures for Nuclear Medicine using administrative (claims) data are included in this document. We have identified codes for these measures, including ICD-9 and CPT (Evaluation & Management Codes, Category I and where Category II codes would apply). Specifications for additional data sources, including EHRS, will be fully developed at a later date. We welcome comments on the draft specifications included in addition to the measure language.

Measure Exclusions:

For process measures, the Consortium provides three categories of reasons for which a patient may be excluded from the denominator of an individual measure:

1. Medical reasons

Includes:

- not indicated (absence of organ/limb, already received/performed, other)
- contraindicated (patient allergic history, potential adverse drug interaction, other)
- intolerant

2. Patient reasons

Includes:

- patient declined
- economic, social, or religious reasons
- other patient reasons

3. System reasons

Includes:

- resources to perform the services not available
- insurance coverage/payor-related limitations
- other reasons attributable to health care delivery system

These measure exclusion categories are not available uniformly across all measures; for each measure, there must be a clear rationale to permit an exclusion for a medical, patient, or system reason. The exclusion of a patient may be reported by appending the appropriate modifier to the CPT Category II code designated for the measure:

- Medical reasons: modifier 1P
- Patient reasons: modifier 2P
- System reasons: modifier 3P

Although this methodology does not require the external reporting of more detailed exclusion data, the Consortium recommends that physicians document the *specific* reasons for exclusion in patients' medical records for purposes of optimal patient management and audit-readiness. The Consortium also advocates the systematic review and analysis of each physician's exclusions data to identify practice patterns and opportunities for quality improvement. For example, it is possible for implementers to calculate the percentage of patients that physicians have identified as meeting the criteria for exclusion.

Please refer to documentation for each individual measure for information on the acceptable exclusion categories and the codes and modifiers to be used for reporting.

Measures #1-2 in the Nuclear Medicine measurement set are process measures.

For **outcome measures**, the Consortium specifically identifies all acceptable reasons for which a patient may be excluded from the denominator. Each specified reason is reportable with a CPT Category II code designated for that purpose.

There are no outcome measures in the Nuclear Medicine measurement set.

The Consortium continues to evaluate and likely will evolve its methodology for handling exclusions as it gains experience in the use of the measures. The Consortium welcomes comments on its exclusions methodology.

Data Capture and Measure Calculation

The Consortium intends for physicians to collect data on each patient eligible for a measure. Feedback on measures should be available to physicians by patient to facilitate patient management and in aggregate to identify opportunities for improvement across a physician's patient population.

Measure calculations will differ depending on whether a rate is being calculated for performance or reporting purposes.

The method of calculation for performance follows these steps: first, identify the patients (or reports) who meet the eligibility criteria for the denominator (PD); second, identify which of those patients (or reports) meet the numerator criteria (A); and third, for those patients (or reports) who do not meet the numerator criteria, determine whether an appropriate exclusion applies and subtract those patients from the denominator (C). (see examples below)

Note: For measure 1 in the Nuclear Medicine measurement set, the unit of measurement is the "final report", rather than "patients".

The methodology also enables implementers to calculate the rates of exclusions and to further analyze both low and high rates, as appropriate (see examples below).

The method of calculation for reporting differs. One program which currently focuses on reporting rates is the Centers for Medicare and Medicaid Services (CMS) Physician Quality Reporting Initiative (PQRI). Currently, under that program design, there will be a reporting denominator determined solely from claims data (CPT and ICD-9), which in some cases result in a reporting denominator that is much larger than the eligible population for the performance denominator. Additional components of the reporting denominator are explained below.

The components that make up the numerator for reporting include all patients/reports from the eligible population for which the physician has reported, including: the number of patients/reports who meet the numerator criteria (A), the number of patients/reports for whom valid exclusions apply (C) and also the number of patients/reports who do not meet the numerator criteria (D). These components, where applicable, are summed together to make up the inclusive reporting numerator. The calculation for reporting will be the reporting numerator divided by the reporting denominator. (see examples below).

Examples of calculations for reporting and performance are provided for each measure.

Calculation for Performance

For performance purposes, this measure is calculated by creating a fraction with the following components: Numerator, Denominator, and Denominator Exclusions.

Numerator (A) Includes:

Number of patients/reports meeting numerator criteria

Performance Denominator (PD) Includes:

Number of patients/reports meeting criteria for denominator inclusion

Denominator Exclusions (C) Include:

Number of patients/reports with valid medical, patient or system exclusions (where applicable; will differ by measure)

Performance Calculation

$$\frac{A \text{ (\# of patients meeting numerator criteria)}}{PD \text{ (\# patients in denominator)} - C \text{ (\# patients with valid denominator exclusions)}}$$

It is also possible to calculate the percentage of patients excluded overall, or excluded by medical, patient, or system reason where applicable:

Overall Exclusion Calculation

$$\frac{C \text{ (\# of patients with any valid exclusion)}}{PD \text{ (\# patients in denominator)}}$$

OR

Exclusion Calculation by Type

$$\frac{C_1 \text{ (\# patients with medical reason)}}{PD \text{ (\# patients in denominator)}}$$

$$\frac{C_2 \text{ (\# patients with patient reason)}}{PD \text{ (\# patients in denominator)}}$$

$$\frac{C_3 \text{ (\# patients with system reason)}}{PD \text{ (\# patients in denominator)}}$$

Calculation for Reporting

For reporting purposes, this measure is calculated by creating a fraction with the following components: Reporting Numerator and Reporting Denominator

Reporting Numerator includes each of the following components, where applicable. (There may be instances where there are no patients to include in A, C, D, or E).

A. Number of patients/reports meeting additional denominator criteria (for measures where true denominator cannot be determined through ICD-9 and CPT Category I coding alone) AND numerator criteria

C. Number of patients/reports with valid medical, patient or system exclusions (where applicable; will differ by measure)

D. Number of patients/reports not meeting numerator criteria and without a valid exclusion

E. All other patients/reports not meeting additional denominator criteria (for measures where true denominator cannot be determined through ICD-9 and CPT Category I coding alone)

Reporting Denominator (RD) Includes:

RD. Denominator criteria (identifiable through ICD-9 and CPT Category I coding)

Reporting Calculation

$$\frac{\mathbf{A}(\# \text{ of patients meeting additional denominator criteria AND numerator criteria}) + \mathbf{C}(\# \text{ of patients with valid exclusions}) + \mathbf{D}(\# \text{ of patients meeting additional denominator criteria NOT meeting numerator criteria}) + \mathbf{E}(\# \text{ of patients not meeting additional denominator criteria})}{\mathbf{RD} (\# \text{ of patients in denominator})}$$

Nuclear Medicine-Radionuclide Bone Imaging

Measure #1: Correlation With Existing Imaging Studies for All Patients Undergoing Bone Scintigraphy

This measure may be used as an Accountability measure

Clinical Performance Measure
<p>Numerator: Final reports that include physician documentation of correlation with existing relevant* imaging studies (eg, x-ray, MRI, CT, etc.) <i>*Relevant imaging studies are defined as studies that correspond to the same anatomical region in question.</i></p> <p>Denominator: All final reports for patients, regardless of age, undergoing bone scintigraphy</p> <p>Denominator Exclusions: System reason for not documenting correlation with existing relevant imaging studies in final report (eg, no existing relevant imaging study available, patient did not have a previous relevant imaging study)</p> <p>Measure: Percentage of final reports for all patients, regardless of age, undergoing bone scintigraphy that include physician documentation of correlation with existing relevant imaging studies (eg, x-ray, MRI, CT,) that were performed</p>
<p>The following clinical recommendation statements are quoted <u>verbatim</u> from the referenced clinical guidelines and represent the evidence base for the measure:</p> <p>Bone scintigraphic abnormalities should be correlated with appropriate physical examination and imaging studies to ascertain that osseous or soft-tissue abnormalities, which might cause cord or other nerve compression or pathologic fracture in an extremity, are not present. (SNM, 2003).¹</p> <p>Relevant radiographs and/or MR imaging of painful sites to exclude cord compression or severe lytic lesions which carry an increased risk of pathologic fracture, should be examined by the physician (SNM, 2003).¹</p>
<p>Rationale for the measure:</p> <p>Radionuclide bone imaging plays an integral part in tumor staging and management; the majority of bone scans are performed in patients with a diagnosis of malignancy, especially carcinoma of the breast, prostate gland, and lung. This modality is extremely sensitive for detecting skeletal abnormalities, and numerous studies have confirmed that it is considerably more sensitive than conventional radiography for this purpose². However, the specificity of bone scan abnormalities can be low since many other conditions may mimic tumor; therefore it is important that radionuclide bone scans are correlated with available, relevant imaging studies. Existing imaging studies that are available can help inform the diagnosis and treatment for the patient. Furthermore, correlation with existing radiographs is considered essential to insure that benign conditions are not interpreted as tumor. While there are no formal studies on variations in care in how often correlation with existing studies is not performed, there is significant anecdotal information from physicians practicing in the field that there is a gap in care and that correlation is not occurring frequently when images are available.</p> <p>Literature suggests that as many as 30% of Radiology reports contain errors, regardless of the imaging modality, Radiologist's experience, or time spent in interpretation³. Evidence has also suggested that Radiology reports are largely non-standardized and commonly incomplete, vague, untimely, and error-prone and may not serve the needs of referring physicians⁴. Therefore, it is imperative that existing imaging reports be correlated with the Nuclear Medicine bone scintigraphy procedure to ensure proper diagnosis and appropriate patient treatment.</p>
<p>Data capture and calculations:</p> <p><u>Calculation for Performance</u> For performance purposes, this measure is calculated by creating a fraction with the following components: Numerator, Denominator.</p>

Performance Numerator (A) Includes:

- Final reports that include physician documentation of correlation with existing relevant imaging studies (eg, x-ray, MRI, CT, etc.)

Performance Denominator (PD) Includes:

- All final reports for patients, regardless of age, undergoing bone scintigraphy

Denominator Exclusions (C) Include:

- System reason for not documenting correlation with existing relevant imaging studies in final report (eg, no existing relevant imaging study available, patient did not have a previous imaging study)

Performance Calculation

$$\frac{A \text{ (# of final reports meeting measure criteria)}}{PD \text{ (# of final reports in denominator)} - C \text{ (# of final reports with valid denominator exclusions)}}$$

Components for this measure are defined as:

A	# of final reports that include physician documentation of correlation with existing relevant imaging studies (eg, x-ray, MRI, CT, etc.)
PD	# of final reports for patients, regardless of age, undergoing bone scintigraphy
C	# of final reports with a system reason for not documenting correlation with existing relevant imaging studies (ie, no existing relevant imaging study available)

Calculation for Reporting

For reporting purposes, this measure is calculated by creating a fraction with the following components: Reporting Numerator and Reporting Denominator

Reporting Numerator includes each of the following instances:

A. Final reports that include physician documentation of correlation with existing relevant imaging studies (eg, x-ray, MRI, CT, etc.)

C. Final reports that do not include physician documentation of correlation with existing relevant imaging studies, but for whom there is a documented system reason for not doing so

D. Final reports that do not include physician documentation of correlation with existing relevant imaging studies and there is no documented system reason for not doing so

Reporting Denominator (RD) Includes:

- All final reports for patients, regardless of age, undergoing bone scintigraphy

Reporting Calculation

$$\frac{A \text{ (# of final reports meeting numerator criteria)} + C \text{ (# of final reports with valid denominator exclusions)} + D \text{ (# of final reports NOT meeting numerator criteria)}}{RD \text{ (# of final reports in denominator)}}$$

Components for this measure are defined as:

A	# of final reports that include physician documentation of correlation with existing relevant imaging studies (eg, x-ray, MRI, CT, etc.)
C	# of final reports that <u>do not</u> include physician documentation of correlation with existing relevant imaging studies, but for whom there is a documented system reason for not doing so
D	# of final reports that <u>do not</u> include physician documentation of correlation with existing relevant imaging studies, and there is no documented system reason for not doing so
RD	# of final reports for patients, regardless of age, undergoing bone scintigraphy

Measure Specifications – Measure #1: Correlation With Existing Imaging Studies for All Patients Undergoing Bone Scintigraphy

Measure specifications for data sources other than administrative claims will be developed at a later date.

<p>A. Administrative claims data Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or paper). Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.</p> <p>(Note: The specifications listed below are those needed for <u>performance calculation</u>.)</p> <p>Denominator (Eligible Population): All patients, regardless of age, receiving bone scintigraphy</p> <ul style="list-style-type: none"> • CPT® Procedure Codes: 78300, 78305, 78306, 78315, 78320 <p>Denominator Exclusion: System reason for not documenting correlation with existing relevant imaging studies in final report (ie, no existing relevant imaging study available)</p> <ul style="list-style-type: none"> • Append modifier to CPT Category II code (in development): XXXXF-3P <p>Numerator: Final reports that include physician documentation of correlation with existing relevant imaging studies (eg, x-ray, MRI, CT, etc.)</p> <ul style="list-style-type: none"> • Report the CPT Category II code (in development) designated for this numerator: XXXXF
<p>B. Electronic Health Record System <i>(in development)</i></p>
<p>C. Paper Medical Record <i>(in development)</i></p>

Nuclear Medicine-Radionuclide Bone Imaging

Measure #2: Communication to Referring Physician of Patient's Potential Risk for Fracture for All Patients Undergoing Bone Scintigraphy

This measure may be used as an Accountability measure

Clinical Performance Measure
<p>Numerator: Patients with documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study</p> <p><i>* Direct communication is defined as communication by the diagnostic imager or a designee to the treating or referring physician or his/her representative with confirmed receipt of the findings (either by fax confirmation or verbal communication)</i></p> <p>Denominator: All patients, regardless of age, undergoing bone scintigraphy, considered to be potentially at risk for fracture in a weight-bearing site*</p> <p>*Examples of this would include: location of a lesion, new lesion in a weight-bearing region, increasing intensity and/or area of a previously noted lesion, etc.</p> <p>Denominator Exclusions: Medical reason for not documenting direct communication* to the referring physician within 24 hours of completion of the imaging study (eg, previously reported prior lesion in same location with no evidence of progression or regression, negative scan)</p> <p>Measure: Percentage of patients, regardless of age, undergoing bone scintigraphy considered to be potentially at risk for fracture in a weight-bearing site for whom there is documentation of direct communication to the referring physician within 24 hours of completion of the imaging study</p>
<p>The following clinical recommendation statements are quoted <u>verbatim</u> from the referenced clinical guidelines and represent the evidence base for the measure:</p> <p><i>According to the SNM procedures guidelines for General Imaging, the reporting of specific findings that constitute "Direct Communication" should be employed when:</i></p> <ul style="list-style-type: none"> • Findings likely to have a significant, immediate influence on patient care should be communicated to the requesting physician or an appropriate representative in a timely manner. • Actual or attempted communication should be documented as appropriate. • Significant discrepancies between an initial and final report should be promptly reconciled by direct communication (SNM, 2004)⁵
<p>Rationale for the measure:</p> <p>Physician communication of serious risk to patients with conditions such as bone metastases with lesions in weight bearing bones, occult fractures, injuries from child abuse or falls, is crucial to appropriate patient care. Quality of life after a fracture through a site of tumor in bone is markedly reduced. Many adverse patient outcomes can be prevented by communicating urgent findings with the referring physician. Literature suggests that as many as 30% of Radiology reports contain errors, regardless of the imaging modality, radiologist's experience, or time spent in interpretation³. A survey from the Physician Insurers Association of America (PIAA) demonstrated that "communication failure was the fourth most common primary allegation in malpractice lawsuits against US radiologists, and that 60% of communication-related claims resulted from failure to highlight an urgent or unexpected abnormal result."⁶. Another study indicated that in 60% of the malpractice cases, the radiologists failed to directly contact the referring physician regarding urgent or significant unexpected findings; in 10% of cases, the written report was not issued in the appropriate time; and in 10% of cases, the report was sent to the wrong physician or patient. The Florida Radiological Society disclosed that 75% of claims against radiologists in 1997-99 stemmed from communication errors. The PIAA dealt with 243 communication-related radiology claims in 1994-2004 with a total indemnity liability of \$16 million⁶.</p> <p>The most common error cited has been the failure by a radiologist to directly contact the referring clinician about urgent, clinically significant, and unexpected findings. The 4 specific situations in which "direct contact" is required, according to the ACR's standard for communication, are:</p> <ol style="list-style-type: none"> 1. Findings requiring immediate medical intervention 2. Conclusions of the radiologist that differ from prior interpretations

- 3. Findings that suggest a likely worsening condition if not treated, and
- 4. Unclear findings that require direct follow-up

Data capture and calculations:

Calculation for Performance

For performance purposes, this measure is calculated by creating a fraction with the following components: Numerator, Denominator, and Denominator Exclusions.

Performance Numerator (A) Includes:

- Patients with documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study

Performance Denominator (PD) Includes:

- All patients, regardless of age, undergoing bone scintigraphy, considered to be potentially at risk for fracture in a weight-bearing site

Denominator Exclusions (C) Include:

- Medical reason for not documenting direct communication* to the referring physician within 24 hours of completion of the imaging study (eg, previously reported prior lesion in same location with no evidence of progression or regression)

Performance Calculation

$$\frac{\text{A (\# of patients meeting numerator criteria)}}{\text{PD (\# of patients in denominator) - C (\# of patients with valid denominator exclusions)}}$$

Components for this measure are defined as:

A	# of patients with documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study
PD	# of patients, regardless of age, undergoing bone scintigraphy, considered to be potentially at risk for fracture in a weight-bearing site
C	# of patients with a medical reason for not documenting direct communication* to the referring physician within 24 hours of completion of the imaging study (eg, previously reported prior lesion in same location with no evidence of progression or regression)

Calculation for Reporting

For reporting purposes, this measure is calculated by creating a fraction with the following components: Reporting Numerator and Reporting Denominator

Reporting Numerator includes each of the following instances:

- A. Patients with documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study
- C. Patients with no documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study, but for whom there is a documented medical reason for not doing so
- D. Patients with no documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study and there is no documented medical reason for not doing so
- E. Patients, regardless of age, undergoing bone scintigraphy, considered not to be at apparent risk for potential fracture in a weight-bearing site or risk for potential fracture in a weight-bearing site is not determined

Reporting Denominator (RD) Includes:

- All patients, regardless of age, undergoing bone scintigraphy, considered to be potentially at risk for fracture in a weight-bearing site

Reporting Calculation

$$\frac{A(\text{\# of patients meeting additional denominator criteria AND meeting numerator criteria}) + C(\text{\# of patients with valid denominator exclusions}) + D(\text{\# of patients meeting additional denominator criteria NOT meeting numerator criteria}) + E(\text{\# of patients not meeting additional denominator criteria})}{RD (\text{\# of patients in denominator})}$$

Components for this measure are defined as:

A	# of patients with documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study.
C	# of patients with <u>no</u> documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study but for whom there is a documented medical reason for not doing so
D	# of patients with <u>no</u> documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study, but for whom there is no documented medical reason for not doing so
E	# of patients, regardless of age, undergoing bone scintigraphy, considered not to be at apparent risk for potential fracture in a weight-bearing site or risk for potential fracture in a weight-bearing site is not determined
RD	# of patients, regardless of age, undergoing bone scintigraphy, considered to be potentially at risk for fracture in a weight-bearing site

Measure Specifications – *Measure #2: Communication to Referring Physician of Patient Risk for Potential Fracture For All Patients Undergoing Bone Scintigraphy*

Measure specifications for data sources other than administrative claims will be developed at a later date.

A. Administrative claims data

Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or paper). Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.

(Note: The specifications listed below are those needed for performance calculation.)

Denominator (Eligible Population): All patients, regardless of age, undergoing bone scintigraphy, considered to be potentially at risk for fracture in a weight-bearing site

- CPT® Procedure Codes: 78300, 78305, 78306, 78315, 78320

Denominator Exclusion: Medical reason for not documenting direct communication* to the referring physician within 24 hours of completion of the imaging study (eg, previously reported prior lesion in same location with no evidence of progression or regression)

- Append modifier to CPT Category II code (in development): XXXXF-1P

Numerator: Patients with documentation of direct communication* to the referring physician within 24 hours of completion of the imaging study

- Report the CPT Category II code (in development) designated for this numerator: XXXXF

B. Electronic Health Record System *(in development)*

C. Paper Medical Record *(in development)*

INFORMATION ON DEVELOPMENT METHODOLOGY FOR NON-RATED GUIDELINES

ACR Practice Guidelines and Technical Standards

PRACTICE GUIDELINES describe recommended conduct in specific areas of clinical practice. They are based on analysis of current literature, expert opinion, open forum commentary, and informal consensus. Guidelines are not intended to be legal standards of care or conduct and may be modified as determined by individual circumstances and available resources.

TECHNICAL STANDARDS describe technical parameters that are quantitative or measurable. They often include specific recommendations for patient management or equipment specifications or settings. Technical Standards are based on analysis of current literature, expert opinion, open forum commentary, and informal consensus. Technical Standards are intended to set a minimum level of acceptable technical parameters and equipment performance and may be modified as determined by individual circumstances and available resources.

SNM Procedure Guidelines

Procedure guidelines summarize scientific evidence and expert opinion regarding the performance of nuclear medicine procedures. In instances where there is little scientific evidence upon which to base procedure guidelines, expert opinion will be used in conjunction with available scientific data. The intent of a procedure guideline is to describe a procedure that will maximize the diagnostic information obtained, while minimizing the resources expended. Procedure guidelines are not intended to describe "cutting edge" or "state-of-the-art" procedures that may be under development at academic medical centers, nor are they intended to be advocacy statements. Procedure guidelines are also not intended to describe the minimally-acceptable procedure.

¹ Donohoe KJ, Brown ML, Collier BD, Carretta RF, Henkin RE, Royal HD, O'Mara RE. Procedure guideline for bone scintigraphy, 3.0. Reston (VA): Society of Nuclear Medicine; 2003.

² *Journal of Clinical Oncology*. 22:2942-2953. 2004, American Society of Clinical Oncology.

³ Reiner B, Knight N, Siegel E. Radiology Reporting, Past, Present, and Future: The Radiologist's Perspective. *J Am Coll Radiol* 2007;4:313-319.

⁴ Johnson AJ, Ying J, Swan JS, Williams LS, Applegate KE, Littenberg B. Improving the quality of radiology reporting: a physician survey to define the target. *J Am Coll Radiol* 2004;1:497-505.

⁵ Parker, JA; Daube-Witherspoon ME; Graham, LS; Royal, HD; Todd-Pokropek, AE; Yester, ME. Procedure guideline for general imaging. Version 3.0. Reston (VA): Society of Nuclear Medicine; 2004

⁶ Physician Insurers Association of America, American College of Radiology. Practice standards claims survey. Physician Insurers Association of America; 1997; Rockville (MD).