DIAGNOSTIC IMAGING IN CHIROPRACTIC FOR GENERAL AND SPECIALTY PRACTICE

Guidelines for Diagnostic Imaging and Radiology Practice Parameters

Presented by:

Practice Guidelines Committee
DEVELOPMENT AND ADOPTION PROCESS:

*Request for document by members

*President assigns task force and outline developed

*Literature reviewed and drafts developed by task force

*Draft distributed by Practice Guidelines Committee
to: Committee, ACCR officers and committee chairs

*Recommendations and comments returned to task force

*Revised and updated draft sent to all ACCR members

*Member recommendations and comments accepted

*Legal counsel approval

Practice Guidelines Committee:

  -Presents document at annual business meeting for consensus as interim guidelines

  -Schedules final approval and adoption

*CDI and ACA ratification

*Publish and distribute to chiropractors, radiologists, state and national organizations, colleges, and licensing boards

*Yearly committee review and revision
This document contains guidelines for diagnostic imaging and radiology practice parameters developed by the American Chiropractic College of Radiology. It provides part of an ongoing effort by these professionals to provide chiropractors and radiologists with improved guidelines for practice.

These guidelines are a published resource for chiropractors to use to help satisfy the demands for documentation by the Agency for Health Care Policy Research (AHCPR), State and Federal regulatory bodies and health care legislation.

The contents of this document reflect current practice and research, and are in concert with other current guidelines. This document best addresses the unique issues and information needed for a detailed understanding of radiology in practice.

These guidelines, in some instances, may be superseded by statutory law in respective state or provincial jurisdictions. They do not purport to convey legal advice. It is recommended that each practitioner should obtain his/her own independent legal advice.

Volume 1 of this document considers the intricacies and complexities of radiology in practice.

Volume 2 is dedicated to aspects of technology, indications for use and the utility of available imaging techniques.

Volume 3 encompasses consensus updates on new research, effectiveness, efficiency, quality of services and procedures.

Volume 4 relates to radiological topics in terms of health care costs, productivity, market forces, statistics and epidemiology.

Further development and adoption is an ongoing process. Yearly presentation to the general members allows continual update. A vote of confidence by general membership at the annual business meeting will emphasize consensus.
DIAGNOSTIC IMAGING IN CHIROPRACTIC FOR GENERAL AND SPECIALTY PRACTICE

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XVII. SUMMARY

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DIAGNOSTIC IMAGING IN CHIROPRACTIC

INTRODUCTION AND OVERVIEW

The fundamental purpose of diagnostic imaging is to gain diagnostic information regarding the patient in terms of diagnosis, prognosis and therapy planning. Studies are performed at the request of a practitioner with the informed consent of the patient. The basic directive of the referring practitioner is to use radiology and to confirm or contribute to the clinical evaluation. Each study is performed in a reasonable manner and a formal written report is generated. Only the written radiology report effectively communicates the information gained from each study.

Diagnostic imaging is a field that has undergone revolutionary changes in recent years. These changes can be largely related to the explosion of advanced imaging technology. Changes have also occurred regarding the more traditional procedures. Because of the rapid advancement of technology and tremendous gains in available information it is not possible to write static guidelines regarding diagnostic imaging. This paper records the present knowledge.

Diagnostic imaging, especially plain film radiography continues to be a mainstay in the assessment of chiropractic patients. Education, publication and researched by clinicians and academicians is continuing to document proper utilization of x-rays and diagnostic imaging for the profession.

This document presents current knowledge regarding proper utilization of diagnostic imaging in the assessment of chiropractic patients. It contains a panoramic overview of diagnostic imaging in regards to education, services, patient selection, imaging modalities and recommendations. A complete discussion of the details of all available radiology services is beyond the context of this document. Imaging modalities most frequently obtained or prescribed by a doctor of chiropractic are discussed.

DEFINITIONS

An understanding of the component parts of the radiology service is essential for the understanding of mild practice. The following are brief definitions obtained from available literature that are used in this document.

Personnel
Several persons may be involved in providing radiology services, as seen in Table 1.

A radiologic technologist or radiographer is the person, other than a license practitioner, who is supervised to apply radiography to humans for diagnostic purposes. The technologist is educated and trained to perform appropriate diagnostic studies under published guidelines in a safe and reasonable manner. The technologist or radiographer does not practice independently but performs studies by referral or the direction of a licensed practitioner. The technologist strives to perform quality services with attention to operator and patient safety.

The general practitioner is a health care practitioner licensed to practice within his/her scope of practice. This practitioner is usually involved in deciding if and when patients required radiographic studies. Radiology related
education for the general practitioner emphasizes radiation protection, standards of quality, clinical indications for radiography and some fundamentals of interpretation.

The term radiologist refers to a licensed practitioner certified by a recognizes national certification board in the specialty of radiology. Certified radiologists have continued postgraduate education and have successfully completed a certification examination. Radiologists supervise and interpret routine radiologic exams as well as advanced imaging procedures. Their service is documented in written radiology reports. Recommendations are often made to the referring general practitioner regarding the necessity and appropriateness of radiologic services.
Table 1. Services and Personnel involved in the production and interpretation of diagnostic imaging studies.

**TASKS-PERSONNEL IN RADIOLOGY**

<table>
<thead>
<tr>
<th>SERVICE</th>
<th>PERSONNEL</th>
<th>Support staff</th>
<th>X-ray Tech</th>
<th>General Practitioner</th>
<th>Radiologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ordering studies</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>PRIMARY DUTY</td>
<td>Option</td>
</tr>
<tr>
<td>2. Perform studies *</td>
<td></td>
<td>OK in some states</td>
<td>PRIMARY DUTY</td>
<td>Option</td>
<td>Option</td>
</tr>
<tr>
<td>3. Assist in production</td>
<td></td>
<td>Usually allowable</td>
<td>YES</td>
<td>Option</td>
<td>Option</td>
</tr>
<tr>
<td>4. Preliminary screening of films</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>Option, frequently performed</td>
<td>Option</td>
</tr>
<tr>
<td>5. Required ** written report</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>Option, if assigned</td>
<td>PRIMARY DUTY</td>
</tr>
<tr>
<td>6. Integrate information from radiology report into patient record</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>PRIMARY DUTY</td>
<td>Option</td>
</tr>
</tbody>
</table>

* Denotes Technical Component
** Denotes Professional Component
Services
The technical component is that portion of radiology services that includes providing the facilities, equipment, resources, personnel, supplies and support needed to perform and produce the diagnostic study.

The level of evaluation and management represents the efforts of the general practice chiropractor involved in patient care. This reflects the processes of ordering studies, review of the radiology reports, determining the significance of the findings, discussion of findings with the patient and in some cases, the preliminary screening of the imaging study.

The professional component represents the participation and services performed by a licensed practitioner, often a radiologist, to interpret each study to its maximum level of diagnosis and to document the diagnostic conclusions of the study in a formal written radiology report. The practitioner may assign any right or claim to the professional component service if all duties of interpretation, diagnosis and reporting are relegated to a radiologist.

The second opinion or consultation is requested in circumstances when a practitioner or radiologist feels more input in the case is in the best interest of the patient. The second opinion is appropriate only after production of the study, generation of a written report and general practitioner involvement determines the need for the second opinion. Note: The primary professional component, as performed by a radiologist, is not considered a second opinion.

LIST OF SUB-TOPICS

A. Sequence of services
B. Radiology education
C. Radiology specialty practice
D. Patent selection procedures
E. Interpretation and reporting
F. Documentation
G. Legal issues in radiology
H. Informed authorization
I. Standards of billing
J. Radiation protection and technology
K. Utilization review

LITERATURE REVIEW

SEQUENCE OF SERVICES

Order Study
The general practitioner, in most instances, is the person who initiates a radiographic study. This is done following a careful clinical evaluation of the patient. In some instances the radiologist or other specialists may suggest or perform studies for a more complete evaluation of the patient. The radiologist is available to discuss proper imaging protocol.

Perform Study
The study is performed by the technologist or qualified person in a safe environment in a manner consistent with published guidelines regarding quality and performance. The technologist and ultimately the physician are responsible
for ensuring the study is of optimum diagnostic quality. In some instances a record that the study was performed is required. There is no report from the technologist about the diagnostic information obtained.

General Practitioner
In many instances the diagnostic study is available to the referring practitioner for screening. This is not a requirement, but is often performed by the conscientious practitioner as part of office procedure. Education and training for the practitioner emphasizes screening for obvious therapy contraindications and in some cases recognition of gross pathology. Brief mention of the screening is usually included in the patient medical record. This service is performed at the level of expertise of a general practitioner and does not constitute the formal written radiology report.

Some practitioners employ specific radiographic analysis in accordance with certain chiropractic technique parameters. This service is optional. The extent, the type and method of analysis is the preference of the practitioner. The use of radiographic mensuration is sometimes practiced. In these instances, the radiographic analysis may be a component of the clinical examination in the detection of the vertebral subluxation complex. This significant service performed by the general practitioner is reflected in the level of office service provided and should be billed using evaluation and management codes. When this service is performed and billed in this manner, it is considered separate from the formal interpretation of the radiographs. The professional component interpretation must still be performed. The practitioner performing this service may elect the option of film interpretation by a radiologist, which may transfer liability.

Initial therapy implementation is possible at this time before a formal written report is generated. This screen does not hold the practitioner liable at the level of a radiologist. The screening review of the study does not constitute the primary professional component.

Interpretation
The standard of care in diagnostic imaging is that all studies are viewed for interpretation by the practitioner or radiologist to obtain the maximum level of diagnosis which is achievable based on the type of study performed. (Public Law) A formal written radiology report documents this service and is included in the patient medical record. This report is signed and dated by the individual performing the interpretation.

Billing for Services
Radiology services are recognized as significant medical services by individuals as well as the public and all insurance programs throughout the United States. Insurers and private patients place a compensable value on radiologic technical charges and on the professional services performed by radiologists. Standard and customary billing procedures are followed.

RADIOLOGY EDUCATION
TECHNOLOGIST, GENERAL PRACTITIONER AND RADIOLOGIST

Education for the Technologist
There is a wide diversity in the educational requirements for the person acting as the technologist in obtaining radiographs. Each state has regulations regarding this issue. There are established certification programs for the radiographic technologist. (Maurer, 1988)
Radiology Education for the General Practitioner
The doctor of chiropractic now receives approximately 400 hours of radiology education. College sponsored courses for the general practitioner emphasize radiation protection, standards of quality, clinical indications and fundamentals of radiological interpretation. (LACC curriculum bulletin) This education prepares the chiropractor to practice as a general practitioner and portal of entry care provider. This education enables the practitioner to be judged responsible at the level of general practice.

Education for the Radiologist
The chiropractic radiologist is a graduate doctor of chiropractic who has continued postgraduate education. Three-year residencies are provided by chiropractic colleges accredited by the Council on Chiropractic Education, the national accrediting agency recognized by the United States Office of Education. Three-year radiology residencies are full-time positions that include training in clinical radiology. As part of these programs, residents spend time in cooperative hospitals, imaging centers, and/or medical school radiology programs to enhance and augment experience received in the chiropractic institutions.

Residency trained chiropractic radiologists have over 6000 hours of education during their three year residencies. Most of their training is dedicated to the development of advanced interpretive skills in the various areas of diagnostic imaging. Training encompasses all aspects of radiology with extra emphasis in skeletal, spinal and biomechanical imaging.

Certification. Specialty certification examinations are administered to qualified candidates. Individuals must pass comprehensive examinations in order to be certified as a Diplomate. (LACC residency curriculum) This chiropractic physician is then considered to be a specialist in radiology.

Advanced certification. This group has evolved due to the rapid advancements in diagnostic imaging. Certified radiologists in advanced imaging maintain the high level of proficiency required to interpret these studies.

RADIOLOGY SPECIALTY PRACTICE

Great strides have been made in the practice of both chiropractic and chiropractic radiology since the 1950's. Chiropractic achieved accreditation of its colleges by the Council of Chiropractic Education, by the Office of Education of the U.S. Department of Education and later by the Council on Post-Secondary Accreditation. Full-time residency training has attained a firm footing. This has contributed to the elevation of radiology to specialty status within the chiropractic profession. More qualified radiologists establish independent practices of radiology.

Evolution of the Specialty
Radiographs were first used by chiropractors to image the spine in the late 1890's. The diagnostic value of x-ray in general practice became apparent. Chiropractors soon provided these services in their own offices.

In the 1930's the National Council of Chiropractic Roentgenologists was formed. Members were chiropractors in general practice who had special interest in x-ray studies. Chiropractic practitioners made efforts to maintain quality standards through chiropractic based organizations.
A certifying board of examiners was established in the early 1950's in an
effort to set even higher standards. The first certification as Diplomate of
the American Chiropractic Board or Roentgenology (D.A.C.B.R.) was granted in
1958.

The short forty-year history of certification emphasizes the relative infancy
of the radiology specialty in the chiropractic profession. Many of the early
Diplomates returned to teach at the chiropractic colleges. The remainder
incorporated their radiologic expertise into general chiropractic practice.
Slowly the colleges established the present radiology residency programs.
Presently there are nine chiropractic colleges offering three-year residencies
in radiology. With education more widely available the number of radiologists
has gradually increased.

Today. This gradual increase has allowed further elevation of standards
including more frequent formation of independent radiology practices. Though
the need for more chiropractic radiologists is still great, there are now
numerous independent radiology practices providing quality services to
practitioners and patients.

Organizational Structure
Chiropractic Radiology includes:

a) The Council Diagnostic Imaging is under the authority of the American
Chiropractic Association. Its membership is open to chiropractors and
students with interest in diagnostic imaging.

b) The American Chiropractic College of Radiology is comprised of Diplomates of
the American Chiropractic Board of Radiology (ACCR). The ACCR serves as the
voice of expertise in diagnostic imaging in chiropractic.

c) The American Chiropractic Board of Radiology is the recognized examining
board in radiology for the chiropractic profession. This is the only
certifying body for radiologists recognized by the American Chiropractic
Association. Those who complete the requisite training and pass the
certifying examination are recognized as Diplomates of the American
Chiropractic Board of Radiology (D.A.C.B.R.).

Definition of a Chiropractic Radiologist
The terms "radiologist" or "chiropractic radiologist" signify a board certified
specialist who uses the methods of the practice of radiology and imaging
procedures including, but not limited to, 1) supervising and performing imaging
procedures, 2) interpretation and consultation for imaging procedures, and 3)
teaching, advising and research in the arm of diagnostic imaging.

Chiropractic radiology is a specialty which includes interpretation and
consultation services at the request of other qualified physicians (doctors).
Chiropractic radiologists provide interpretation and consultation in health
care facilities (private offices, hospitals and teaching institutions) to meet
the needs of referring physicians (doctors) and their patients.
How to Recognize a Radiologist

The quality of the services provided by the chiropractic radiologist in independent practice is reflected by the quality of their professional standards. Each radiologist has specialty certification status as Diplomate from a national examination board with the minimum standards of:

a) three years of clinical radiologic experience and required post graduate hours in radiology, sponsored by a chiropractic college that holds status with the Council of Chiropractic Education or its equivalent, following a syllabus prescribed by the school; or

b) 4000 hour residency under the auspices of a chiropractic college that holds status with a national chiropractic accrediting agency recognized by the United States Department of Education, or its equivalent, following a syllabus prescribed by the college; and

c) successful completion of a comprehensive certifying examination covering all aspects of radiology.

General members of the American Chiropractic College of Radiology are certified Diplomates of the American Chiropractic Board of Radiology (D.A.C.B.R.).

Radiologists supervise the performance or radiographic examinations including plain film radiography and advanced imaging procedures. Radiologists interpret diagnostic images and provide written reports of their findings. They advise referring physicians (doctors) regarding the necessity and appropriateness of radiologic services and whether to seek or to avoid certain diagnostic or therapeutic procedures. They also provide information about obtaining the maximum benefit and yield to the patient and referring physician (doctor) through such procedures.

A radiologist makes available modern imaging on a cost-effective basis to the public and the referring physicians (doctor). In some instances there is a need for the radiologist to take an active part in ordering radiologic studies. They pursue research in the diagnostic application of radiologic procedures. They may be called upon to act as expert witnesses in radiology with respect to legal matters or litigation. The radiologist serves in an advisory capacity to governmental agencies, licensing boards and other organizations as a radiology consultant.

Chiropractic radiologists are also actively involved in the advancement of technology. The production of images in the demonstration of normal and abnormal anatomy, as well as an understanding of the interaction of energy and matter, make the radiologist vital in the practice of modern chiropractic in almost any setting. The advance of the medical and technological facets of radiology is so rapid that certified radiologists are essential in assisting the clinician in integrating new technologies with case management.

The practice of radiology continuously involves the application of this technology to patient imaging and treatment. As long as these modalities continue to evolve, it is not practical to prepare a static definition of the practice of radiology that cites every modality and procedure by name.

Acceptable practice of radiology is now well recognized to include, but is not limited to, plain films, fluoroscopy, tomography, thermography, ultrasound, nuclear medicine imaging, computed tomography, digital radiography, magnetic resonance, and interventional radiology.

Individual practices may vary by intent, licensure and scope of practice laws.
Advantages of Using Radiologists

Patient protection. The public interest is best served when primary chiropractic physicians and other specialists refer patients to qualified chiropractic radiologists for professional consultation. Radiologists are best prepared to decide which procedure can yield maximum diagnostic benefit to the patient and to the referring physician. Radiologists advise referring physicians when to perform or to avoid certain diagnostic procedures.

Not only may referral reduce radiation risk by improving patient selection and radiographic technique, but it also eliminates the appearance of economic incentive to non-radiologists to perform radiologic consultation.

Thrall and Wittenberg state; Patients greatly benefit from higher quality clinical care as a result of the higher levels of expertise brought to bear by specialty trained radiologists. (Thrall) A close relationship between the clinician and the radiologist is essential to limit the unnecessary acquisition of inappropriate procedures. (Hall)

Accurate interpretation is critical in determining appropriate therapy and other management decisions. The argument that only when clinician confidence is low does the radiologist need to be consulted was not supported in Mayhue's study of non-radiologist interpretations of emergency room radiographs. Their study concluded that higher clinician confidence did not safely exclude the need of a radiologist's review in all cases. (Mayhue)

Other studies that attempt to advocate only non-radiologist review of radiographs do not address specificity of interpretations by non-radiologists. This meant that clinician over-reads (false positive) which might have devastating consequences to the patient were not considered in the studies. (Grattan. Halvorson 1989)

Practitioner protection. It is not a requirement for the general practitioner to provide the professional component of imaging studies. The use of certified radiologists allows transfer of medical liability to the specialist.

Independent Practice

The basic tenets of the independent practice of diagnostic radiology require the establishment of credentials by satisfactory completion of prescribed training, certification of such training by successful completion of a qualifying examination and the independent establishment and billing of fees for professional services.

Radiologists earn their right to provide radiologic services by demonstration of expertise in their specialty and sound medical judgment. Radiologists have earned the independence to practice their specialty without unwarranted interference and with the same independence provided other physicians.

Radiologists establish reasonable fees based on the cost of providing the service and the level of skill required for the procedure. When radiologists practice in settings in which they incur technical costs as well, they are entitled to charge for both the professional and the technical fee.

Insurers and private patients place a compensable value on the professional services provided by radiologists. Radiologists are subject to reasonable
review of their charges as may be imposed by prudent buyers of medical services.

In independent practice, radiologists are reimbursed in the same manner as other physicians for professional services provided to patients. Simply stated, separate billing means that radiologists establish fees and bill for their professional services. Radiologists should be free to choose the method of billing most appropriate to their needs.

Chiropractic radiologists in independent practice respect all laws, courts and authorities that may govern the practice of chiropractic in the United States of America.

PATIENT SELECTION PROCEDURES FOR DIAGNOSTIC IMAGING

Frequently diagnostic imaging is an integral part of the chiropractic work-up and management of patient conditions. Diagnostic imaging procedures aid the chiropractor in evaluation, diagnosis and patient case management. Diagnostic imaging procedures are diverse and span a wide spectrum ranging from traditional plain film radiographs to complex computer generated images. The literature regarding the uses of diagnostic imaging is ever expanding. Recent chiropractic literature has very little information featuring the cognitive process employed in deciding when patients should be imaged. Some feel that plain film x-rays should not be acquired unless the results of the exam could reasonably have an effect on therapy. (Sesiontag, Wyatt) The motivation for ordering radiographic studies is largely mediated by clinician preference, rather than set criteria. Over-utilization may be the result of inexperience, habit, peer pressure, patient education or reassurance, and fear of litigation. (Deyo 1087)

Impact
Proper utilization of imaging has wide ranging effects. Chiropractors use their understanding to influence the quality of imaging, patient management and care as well as possible financial impact.

Diagnostic Efficacy
The effectiveness of diagnostic imaging is an important consideration. Effectiveness can be measured and varies with each type of imaging. (Baddely) The efficacy of diagnostic imaging can be assessed at three levels: diagnostic, therapeutic and prognostic. (Lusted) It is assumed that the most efficacious investigation will have a beneficial impact at all three levels. Unfortunately, it is not always easy to prove benefit at all three levels because many other factors come into play. Considering the complexity of clinical presentations, diagnostic investigations are usually considered useful when they reduce diagnostic uncertainty on the part of the doctor who is managing the patient. (Baddely) The uncertainty may relate the to presence, the type or extent of a disease process. Chiropractors understand that imaging is also useful when it contributes to the formulation of a correct management decision based on prognosis and therapy planning. (Baddely)

Accuracy and Clinical Certainty
An important feature in selection of diagnostic studies is accuracy of the test. (Baddely) A test must be selected based on its ability to discriminate between those that have the disease in question and those who do not. Accuracy is measured mathematically and is described by numerous terms. Examples of these terms are: positive, negative, false positive, false negative, predictive
value, sensitivity and specificity. Doubliet, Baddely and Metz offer adequate
descriptions of the theory of accuracy and test selection.

In most cases it is the combination of the accuracy of the test and clinical
opinion of the chiropractor that designates the performance of imaging studies.
The clinical application of these principles helps one to understand that
pretest clinical assessment is as important as the sensitivity and specificity
of the diagnostic test in the determination of the patient condition. (Chang)
The history and physical examination are considered sensitive indicators of the
presence of therapeutically significant disease. The understanding of these
principles emphasizes that the doctor has a working clinical opinion that is
used as a guide in the selection of imaging. If the clinical opinion is not
established, imaging in not indicated.

Decision Making for Patient Selection
The chiropractic clinician selects the study which will give the required
information with sufficient reliability and with minimal risk to the patient.
(Sinclair, Maurer 1988, Moos, Kovach) The value of the information gained from
the imaging procedure must be worth the possible detrimental effects. Likewise
the dangers of not using imaging may be greater than the risk of imaging. The
risks and benefits must always be balanced. The selection of patients for
radiographic examination is based on the following guidelines;
a) the need for radiographic examination is based on history and physical
examination findings;
b) the potential diagnostic benefits of the radiographic examination are judged
to outweigh the risks of ionizing radiation;
c) radiography is used to assist the practitioner, (diagnosis of pathology,
identify contraindications to chiropractic care, identify bone and joint
morphology, and acquire postural, kinematic and biomechanical information);
d) routine radiography of patients as a screening procedure is not appropriate
practice except under public health guidelines.

A shotgun approach to diagnosis imaging and routine investigations are no
longer valid. (Baddely, Romfh) A more rational step-by-step or algorithmic
approach based upon sequential assessment of diagnostic livelihoods, is more
effective. There are many publications that outline the variety of algorithmic
approaches to patient evaluation. (McNeil, Eisenberg 1979, Scott)

Additional Selection Considerations
The previous discussion is easily applied to the initial evaluation of a
patient. Occasionally other specific, clinical circumstances require
acquisition of imaging studies. Following are additional considerations for
patient imaging.

a) Poor therapy response- Occasionally case reports imply the value of re-
imaging based on prior negative result. (Kemp, Mjoen) It is a fact that
tests with low predictive value are sometimes selected as a compromise due
to low risk. If such a test contradicts clinical opinion it may be repeated.
The major hazard is relatively poor accuracy. It is not sufficient to simply
image patients due to clinical uncertainty. More correctly, chiropractors re-
evaluate the entire clinical picture. The subsequent new list of clinical
opinions may indicate the need for further imaging. In these cases another
type of imaging may be better suited for the new clinical opinion.
b) Progressive pathology-In certain pathologic conditions, the condition may
change over time. In these cases periodic re-examinations are appropriate to
monitor progression of the condition or to assess the effectiveness of
treatment. Some examples include scoliosis, tumor, etc. (Yochum) This also
applies to entities such as fracture in which the progression of healing may be assessed. The frequency of re-examination depends on the nature of the disease.

c) Discharge examination—There is little documented need to image patients to be released from care. One exception is the utilization, under selected justified circumstances of a diagnostic imaging test to establish disability or permanency of an abnormality, if such would be helpful in determining the disposition of a claim. (Hansen)

d) Frequent re-examination—The need for frequent diagnostic images for purely biomechanical analysis is not well documented. Radiographic re-examination for the purposes of postural or biomechanical assessment is appropriate only when following accepted and published guidelines. Guidelines only rarely indicate numerous re-examinations.

e) Special regulations—In some instances there may be requirements for defined Imaging for participation or inclusion in certain programs. An important example is the policy of the Special Olympics, Inc. There is the requirement that participants of certain Special Olympic activities who have Downs' syndrome be radiographed for atlantoaxial instability (Shriver), as established by the American Academy of Pediatrics. Other examples may include screening for employment, insurance or risk populations. Routine radiographs acquired as a pre-employment screen have been considered of diagnostic or prognostic value in relationship to the potential for the development of occupational back pain. (Divesey) This belief has come under severe criticism due to the extremely low diagnostic yield, unproven predictive value and prohibitive cost, (Joseph, Eisenberg) These requests must be evaluated on a per case basis.

f) Therapeutic contraindications—In some instances the pure clinical picture may not indicate a need for diagnostic imaging. However the therapy being considered by the chiropractor may be contra-indicated with certain clinical conditions. (Gattermann) Imaging is indicated when specific contra-indications are suspected.

g) Specialist recommendations—There is occasion that upon consultation of a specialist (any specialty) there may be recommendations to better define the clinical picture. This may include further diagnostic imaging, lab tests, etc. In these instances the recommendation of the specialist is correlated with existing information. The decision whether or not to pursue further testing lies with the referring physician. A thorough understanding of the many factors involved is in the best interest of the patient and referring physician. Following this protocol, imaging is usually considered appropriate.

Before the selection or evaluation of a specific diagnostic imaging cost is considered, it is important to understand clearly what confronts the Doctor of Chiropractic. The chiropractor is faced with a patient that presents with a constellation of historical, physical and laboratory findings all which suggest a tentative clinical opinion or diagnosis. The chiropractor at this point must decide it imaging will be needed for each patient.
VERTEBRAL SUBLUXATION COMPLEX

State and Federal statutes recognize Doctors of Chiropractic as primary, portal of entry, health care providers. (Kusserow) Chiropractors offer a natural health care program for the treatment and prevention of disease. They use traditional and alternative non-toxic methods that address functional and structural integrity, spinal health, life style awareness, nutrition, diet and exercise. (CCE) One of the many patient features that chiropractors recognize during the examination, diagnosis, treatment and management of patients is the subluxation complex. Imaging does play a role regarding some of the features of the subluxation complex. Diagnostic imaging assists the chiropractor in recognizing patient status and assists in determining plans of action in reaching therapeutic and preventative goals. (ACA)

Components
The vertebral subluxation complex (VSC) may consist of a complex array of pathological, biomechanical and pathophysiological components. The VSC may encompass both bony and soft tissue structures. Specific features of the VSC have been described to include loss of juxtaposition, nerve impingement, alteration of nerve impulse, modification of axoplasmic flow, spinal kinesopathology, neuropathology, myopathology, histopathology, and other pathological disease processes. Refer to Leach for better discussion of the features of the VSC.

Manifestations
The VSC may be associated with a wide spectrum of symptoms, diseases, disease complications, or in some cases may occur as an isolated manifestation, sometimes without associated patient complaints. In instances where the subluxation complex alters the function or structure of body components, diagnostic imaging may be useful in detecting these changes.

Evaluation
The evaluation of the VSC can be accomplished by numerous methods. Table 2 outlines general methods used for the detection of the VSC.

Table 2. General classification of the types of study useful in the evaluation of the various components of the vertebral subluxation complex.

<table>
<thead>
<tr>
<th>PATHOLOGICAL COMPONENTS</th>
<th>BIOMECHANICAL COMPONENTS</th>
<th>PATHOPHYSIOLOGICAL COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case History</td>
<td>Posture analysis</td>
<td>Physical exam</td>
</tr>
<tr>
<td>Physical exam</td>
<td>Static palpation</td>
<td>Orthopedic exam</td>
</tr>
<tr>
<td>Lab testing</td>
<td>Motion palpation</td>
<td>Neurologic exam</td>
</tr>
<tr>
<td>Imaging</td>
<td>Log length testing</td>
<td>Imaging</td>
</tr>
<tr>
<td>Pathologic exam</td>
<td>Static imaging</td>
<td>Physiologic tests</td>
</tr>
<tr>
<td></td>
<td>Dynamic imaging</td>
<td>Lab/chemical tests</td>
</tr>
</tbody>
</table>
**Radiological Manifestations**

The VSC may be associated with structural or functional changes that can be detected radiographically. Numerous manifestations may be detected with all aspects of imaging ranging from plain and stress radiography, computed tomography, magnetic resonance imaging, thermography and other studies.

The diagnostic efficacy and reliability of each procedure varies greatly. Volume II of this document details each imaging procedure in terms of specific manifestations of the VSC and utilization in chiropractic practice.

**Role of Imaging**

Imaging is used to characterize the components at the VSC when such characterization is necessary to render chiropractic care, imaging may be indicated if less hazardous or less expensive alternative examinations are not available or conclusive. These parameters apply to the biomechanical, pathological and pathophysiological components of the VSC.

Diagnostic imaging remains as a useful tool in documentation of the effects of the VSC, as well as detecting and characterizing other pathologies. Judicious use of imaging assists the chiropractor in achieving appropriate goals of diagnosis and treatment. (Vear)

**INTERPRETATION AND REPORTING STUDIES**

All chiropractic radiographic studies are performed to reach a diagnostic conclusion. (Public Law) Formal interpretation and reporting of each imaging study documents the findings. A written (usually typed) interpretation of the imaging study is included as part of the patient's permanent medical record. Reports are signed and dated by the individual performing the interpretation.

The practicing chiropractor, as a portal of entry provider, chooses who is to provide the reading of the imaging studies and generation of the written report. Performing the professional component of an imaging study by the general practitioner is not mandated, and may be relegated to the radiologist. It must be performed by one or the other in each case. This decision is based on preferences of practice, liability considerations, availability of services and other issues.

Halvorsen and Kunian (1989) surveyed the referral habits of seventy family practitioners from more than fifty practices. Their data include descriptive data about the physicians and their attitudes as well as descriptive data about the relationship, if any, which was maintained with consulting radiologists. Nearly forty four percent (44%) of the survey group had all their x-rays read by a radiologist. Of the group which read their own films, seventy percent (70%) reported less than ten percent (10%) of the films they acquired were sent to a radiologist. This study did not evaluate the frequency or impact on patient care of false positive or false negative interpretations.

It is interesting to note that the study found a significant correlation between radiologist proximity, frequency of radiologist visits to the office, and increased frequency of referral. This indicates that the availability of a radiologist's interpretation has an impact on referral pattern. (Halvorsen 1988)
Chiropractors use radiologists in order to benefit from enhanced diagnostic accuracy (including reduced false positive and false negative interpretations). Improved patient care can be achieved through consultation with a radiologist.

Components
The procedure for producing a complete report is provided in an article entitled *Writing Radiology Reports in Chiropractic*. (Taylor)

The components of the formal written radiology report contain: patient identification, location where studies were performed, study dates, types of studies, views included, radiographic findings, diagnostic impressions, and a signature including professional qualifications. Other components that may be part of a report include: recommendations for follow-up studies and comments for further patient evaluation.

A unique radiology report is generated for each study. Use of check-list forms is not appropriate and may entail some legal risk. (Ladanheim Vol:5) Forms of this type invite criticism as prepackaged income assisting devices. The practitioner's credibility may be questioned when all patient files contain identical checklists instead of containing individualized radiology reports.

Function
The radiological report is a written record of the interpretive findings and serves as an important part of the patient record. The information contained in the radiographic impressions comprises only a small part of the complete patient evaluation. The main function of the formal written report is to document the findings obtained from the imaging study. The radiographic report contributes to the clinical picture but should not be construed as the sole determinant of the patient's clinical and therapeutic management. Reports containing statements regarding case management directives and therapeutic protocols are considered inappropriate and are discouraged in most instances. Hunter and Boyle determined that the radiological report was helpful in over sixty percent of cases and reduced error rates in interpretation of subsequent studies.

The general practitioner uses the documented x-ray findings. The general practitioner integrates information from the clinical history, physical examination, and the results of other diagnostic procedures to form a complete clinical impression.

Yochum lists five other uses for recording radiographic findings in a written report: 1) medicolegal circumstances, 2) for comparison with prior or subsequent exams, 3) use as a reference if radiographs are lost or not available for review, 4) communication with other health practitioners, 5) expediting treatment regimen by providing a resume of important indications and contraindications for therapy.

Timing
The radiology report should convey the findings of the diagnostic study in a timely manner. This is accomplished by the responsibility of the referring physician and the radiologist. Radiographs should be available in a reasonable time period. The radiologist has the duty to ensure communication to the clinician by a written report, in a timely manner. In emergency situations, telephone communication is usually indicated. The primary care physician reviews the findings, incorporates them into the cue work-up and takes appropriate action.
The primary practitioner uses the reported findings to confirm the therapy plan or procedures already instituted and judge their appropriateness. Remember in most cases the radiology study only partially contributes to the clinical picture. The primary practitioner usually institutes the initial treatment plan based on patient history and physical findings prior to obtaining the formal written radiology report.

**DOCUMENTATION**

Documented results of imaging studies become a component part of the patient file. All diagnostic imaging studies must have a written report to document the radiologic findings. The report stands as a legal document which provides evidence the interpretation was performed. It relates a clear picture of the examination findings. Its primary purpose to provide communication between the radiologist and the referring physician. The report should include patient identification, location where studies were performed, study dates, types of studies and views, radiographic findings, diagnostic impressions, name of the individual performing the interpretation, and a signature including professional qualifications. A unique radiology report is generated for each study. Use of checklist forms is not recommended or supported. Forms of this type are criticized as income assisting devices rather than an intelligent, well-analyzed, individualized radiology report. Credibility is at risk when all files are supplied with identical checklist forms rather than individualized reports. (Ladenheim, Vol:5)

**RULES, REGULATIONS AND LEGAL ISSUES REGARDING RADIOLOGY AND IMAGING**

**Regulations**

Federal regulations state that radiography (as applied to chiropractic practice) is to be used solely for diagnostic purposes (Public Law. 97-35 sec, 978) The Purpose of the study must be to reach a diagnostic conclusion in all cases.

There are four (4) required standards that must be met with each imaging study: 1) the study must be obtained based on clinical need, 2) the study must be of sufficient diagnostic quality, 3) there must be interpretation of the study to reach diagnostic conclusions about the study, and 4) the information from the study must be correlated with patient management. (Bundy)

The National Council on Radiation Protection (NCRP) has established recommendations for the safe and effective use of diagnostic radiology. The laws and regulations governing the use of diagnostic radiology are established by individual state radiation protection authorities. Chiropractic radiographic facilities implement the NCRP recommendations and abide by the state laws and regulations in their respective jurisdictions.

The following guidelines are based on a current review of the literature. These recommendations are implemented by chiropractors in addition to, rather than instead of, NCRP recommendations and state laws and regulations.

**Diagnostic Procedures and Instruments**

Procedures and instruments allowable for use in chiropractic practice are regulated in each state. Procedures approved are usually those taught in CCE accredited colleges. Those diagnostic procedures typically approved include, but are not limited to examination by: plain films, fluoroscopy, tomography, thermography, ultrasound, nuclear medicine imaging, computed tomography, digital radiography, magnetic resonance, and interventional radiology. Volume 2
of this document discusses each of those technologies in terms of methods and uses for the chiropractic doctor and their patients.

Chiropractors observe state regulations regarding the use of x-ray. It is beyond the scope of this paper to list all state standards. Several common regulations follow:

Routine radiography of a patient shall not be performed without due regard for clinical need.

Any offer or advertising of free x-rays to actual or potential patients shall be accompanied by the statement "if necessary". An advertisement for "Free X-ray Services" will allow a claimant to allege failure to diagnose. Providing free x-rays does not relieve the practitioner of his/her responsibility to perform an adequate series in each region imaged. Failure to meet this accepted clinical standard in conjunction with this advertisement might be construed to represent clinical malpractice. This may result in significantly increased of litigation should the study fail to reveal a significant finding which would have been detected had a complete series been performed. A claimant in such a case may reasonably allege failure to diagnose, and may clearly suggest that the doctor took an inadequate number of views solely because he/she would not be paid for them.

Repeat radiographic evaluation of the patient shall not be undertaken without significant observable clinical indication, as determined by the treating Chiropractic physician.

Some state professional conduct rules prohibit the individual practitioner from advertising as a specialist unless the licensee holds current specialty certification.

Chiropractors are aware that it is unethical (illegal in most states) to receive kickback payments for ordering studies. (Committee on implications of for-profit enterprises in health care) Ownership, limited partnerships and stock purchases are ethical ways to have financial investment in imaging facilities or centers, The Office of the Inspector General has defined specific “safe-harbor” rules which govern facility ownership.

No out-of-pocket expense (N.O.O.P.E.) billing schemes are viewed as unethical and fraudulent business schemes. The insurance industry views N.O.O.P.E. as nothing less than fraudulent misrepresentation on the part of the patient and provider. A number of states have taken action to discourage the practice of N.O.O.P.E. billing procedures. These actions range from limits on advertising to classification as illegal abuse and grounds for disciplinary action. The American Chiropractic Association has a policy statement that condemns N.O.O.P.E. billing practices. The Office of Inspector General of the Department of Health and Human Services identifies this practice as unethical and has adopted the following position regarding N.O.O.P.E. schemes. Routine waiver of deductibles and co-payments by charge-based providers, practitioner, or suppliers is unlawful because it results in 1) false claims, 2) violation of anti-kickback statutes, and 3) excessive utilization of items and services.
Medical Responsibility
Levels of medical responsibility and malpractice conform to standards of care. Individuals or institutions are responsible to the level of service provided. (see Table 3) Adequate technology is the responsibility of the technologist and the facility providing the services. Radiologic diagnosis is achieved at the level of the general practitioner and the specialist. Medical responsibility reflects this distinction.

Practitioners rely upon the talents of the technologists with whom they work. Indeed, a good technologist will certainly enhance radiology performance. Practitioners performing duties in general practice are held responsible in medical malpractice to the standards of a general practitioner.

Reporting and interpretation of diagnostic imaging by certified specialists are judged by levels of competence for that specialty. Where the defendant holds himself out as a specialist (e.g., radiologist), he will be held to the minimum standard of that specialty. This will most likely be higher than those of the medical profession in general. (Bundy) The judgement is determined based on the standard skill and knowledge for a specialist as determined by a national examination board. These examiners certify the physician (doctor) in the particular specialty area. The courts require the specialist to adhere to a broadened standard of care as opposed to the general practitioner.

The most common questions regarding medical liability in performing the professional component in diagnostic radiology is based on actions in the following circumstances; 1) is the radiologist or person reading the films competent because of requisite education, training and experience to diagnose the patient's condition at the level of a specialists, 2) were proper procedures employed by the personnel involved?, 3) does the diagnosis or conclusion match that of other reasonable and competent specialist practitioners? 4) would a different diagnosis have avoided any bad result that may occur? (Bundy)

In instances of interpretation by a specialist, the attending or referring non-specialist is held to the level of competence of the non-specialist peers. In these instances the general practitioner is not acting to possess and has not claimed to possess special knowledge skills or experience and will be compared to the reasonable and prudent general practitioner.

In instances of interpretation by a non-specialist, the non-specialist acting to possess and claims to possess special knowledge, skills or experience and will be compared at the level of the specialist. Performing the interpretation is held to the level of the standard of care for that study. Failure to conform to the standard of using available radiologist for film interpretation may reflect cause for litigation if there is untoward result. (Peterson)

Causation as applied to medical malpractice considers adherence to conform to the professional standard of care. The term causation actually has three components: 1) it means that something a physician did or fails to do was the cause of the patients injury, 2) it means whatever the defendant did or failed to do was a substantial factor in producing the injuries, 3) it means the defendant actually committed the negligent act. The components of causation apply to all parties in the guidance or practice of medical care. This concept applies to the primary physician, the specialist and others that may deny or regulate the delivery of health care. If diagnosis or treatment is denied by a third party, that third party is accountable under the concept of causation for any injury that may result. (Ladenheim Vol:3)
Multiple parties that contribute to a plaintiff's injuries, are considered as joint defendants. Another term, vicarious liability means that a party is liable because some other person whom he had the power to direct or control committed a negligent act. An employee-employer relationship is the most common. Other instances of vicarious responsibility have been judged when the independent contractor and clinic or institution omits to clearly notify the patient of the distinction between the institution and the independent contractor or other provider (radiologist).

There is not vicarious liability to the institution when the radiologist clearly advertises (public brochures) and posts notice of such distinction including billing separately for services. See Table 4.
Table 3. Radiology tasks and level of responsibility of individuals that perform the duty.

**RADIOLOGY: WHO CARRIES THE LIABILITY?**

<table>
<thead>
<tr>
<th>TASK PERFORMED</th>
<th>DISTRIBUTION OF LIABILITY</th>
<th>SUPPORT STAFF</th>
<th>X-RAY TECH</th>
<th>GENERAL PRACTITIONER</th>
<th>RADIOLOGIST AS EMPLOYEE OF GENERAL PRACTITIONER</th>
<th>RADIOLOGIST NOT AS AN EMPLOYEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient selection</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>SOMETIMES</td>
<td>SOMETIMES</td>
</tr>
<tr>
<td>Technical component</td>
<td></td>
<td>NO</td>
<td>YES</td>
<td>YES *</td>
<td>YES *</td>
<td>YES *</td>
</tr>
<tr>
<td>Preliminary screen without separate report</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>YES **</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Professional component performed by general practitioner</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>YES ***</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Professional component performed by radiologist</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>YES */NO</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

* An EMPLOYER is ultimately responsible for any and / or all activities performed by an EMPLOYEE as a direct outcome of job related activities.
** A Chiropractor operating within the scope of practice of general Chiropractic Physician is liable for his / her actions to the level of a general practitioner.
*** When a general practitioner assumes the role of a specialist, he / she assumes liability to the level of that specialty.
INFORMED CONSENT AND PATIENT AUTHORIZATIONS

The radiology portion of chiropractic practice requires numerous special patient release forms. These forms are readily used in conjunction with diagnostic imaging studies. There are a variety of regulatory requirements in each state. Please consult state statutes and specific codes of regulation regarding specific details. The following examples are typical of those used in chiropractic practice. The following examples of consent forms can be adapted to individual practice needs.

PATIENT CONSENT TO X-RAY

I ___________ authorize the performance of diagnostic x-ray examination of myself which the above doctor or his associates may consider necessary or advisable in the course of my examination and treatment.

Signed ___________ Date ___________

CONSENT TO X-RAY MINOR CHILD

I ___________ authorize the performance of diagnostic x-ray examination of my child or ward which the above doctor or his associates may consider necessary or advisable in the course of examination and treatment.

The patient ___________ is a minor, ___________ years of age.

Signed ___________ Date ___________

PREGNANCY RELEASE

This is to certify that to the best of my knowledge I am not pregnant and the above doctor and his associates have my permission to perform diagnostic x-ray examination. I have been advised that x-ray can be hazardous to an unborn child. Date of last menstrual period.

Signed ___________ Date ___________

RELEASE AND TRANSFER OF RECORDS

Numerous states have regulations regarding the release of medical records. Typically the provider is expected, upon written request of a patent, guardian or legally authorized representative of a patient, to furnish a copy of that patient's medical record file. These records are to be furnished within a reasonable time following the date of request. Any fees associated with this service are typically limited to the actual cost of time and materials, used to compile the records. The request for the transfer of records must be written and signed. The following example is commonly used.
RELEASE AND TRANSFER OF RECORDS

In regard of diagnostic reports and x-rays in the possession of:
Clinic/Dr. _______________
Address _______________

Date(s) of study _______________ Patient name _______________
I hereby authorize the release of the above x-rays and diagnostic reports and request they be transferred to:
Clinic/Dr. _______________
Address _______________

I understand that if duplication of x-rays and reports is needed a copy fee may be charged to the patient account.
Signed _______________ Date _______________
Table 4 Factors that influence matters of vicarious liability for the general practitioner and the radiologist.

**FACTORS THAT INFLUENCE SHARED LIABILITY VS. SEPARATE LIABILITY**

<table>
<thead>
<tr>
<th>SHARED LIABILITY</th>
<th>SEPARATE LIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Singularly or in combination the following factors may nullify &quot;Separate Liability&quot; between the general practitioner and the radiologist.</em></td>
<td><em>Separate and distinct liability is likely if ALL of the following are satisfied.</em></td>
</tr>
<tr>
<td>The radiologist is an EMPLOYEE of the general practitioner.</td>
<td>The radiologist is an INDEPENDENT PROVIDER.</td>
</tr>
<tr>
<td>The general practitioner COLLECTS FEES for the radiologist.</td>
<td>The radiologist is NOT AN EMPLOYEE of the general practitioner.</td>
</tr>
<tr>
<td>Patients are NOT notified of radiologist's services.</td>
<td>There is DISTINCT AND SEPARATE PATIENT BILLING for the radiologist's services.</td>
</tr>
<tr>
<td>Patients are NOT notified of distinction between the services provided by the general practitioner and the service provided by the radiologist.</td>
<td>The radiologist provides PUBLIC NOTICE of explaining billing practices to the patients.</td>
</tr>
<tr>
<td>Patients are NOT billed by the radiologist.</td>
<td>The radiologist clearly uses POSTED NOTIFICATION that the radiologist and radiology services are distinct from the services providing by the general practitioner.</td>
</tr>
</tbody>
</table>
STANDARDS OF BILLING

Radiology services are recognized as significant medical services by individuals as well as the public and all insurance programs throughout the United States. Insurers and private patients place a compensable value on general practice office services, the radiologic technical charges and on the professional services performed by radiologists. Standard and customary billing procedures are followed.

Definitions
The technical fee is charged and collected by the facility producing the study. The technical component covers the cost of providing the technicians, equipment, and supplies involved in the performance of the radiologic exam.

The professional fee is the fee for the radiology interpretation and the written report. Professional fees charged and collected by a radiologist are preferably based on a fee-for-service model that is universally accepted by American insurance companies and by patients.

The global fee is the combined fee for the technical and professional components.

Levels of service fee. Office services necessitate wide variations in skill, effort, time, responsibility and medical knowledge in the prevention or diagnosis and treatment of illness and the promotion of optimal health. Each level of service may be used by all physicians. Several levels are recognized. The efforts, time, skill and responsibility regarding the integration of patient case management and diagnosis with radiology services is reflected in the level of service called "evaluation and management fee".

Methods of Billing
The method of billing is dependent on the methods of practice in each clinic. Each facility has the right to bill the technical component when performing the study. The radiologist has the right to bill for the professional fee. The service of reviewing an x-ray report, determining its significance and informing the patient is reflected in the level of office service performed by the general practitioner.

Standard current procedural terminology codes are used for reimbursement of radiology services. Billing codes are described as: 1) technical component (TC) fee only, 2) level of evaluation/management (E/M) service fee for practitioner involvement, 3) professional component (PC) fee only, and 4) global (combined) fee.

Examples of Billing Options
Each facility or individual has the right to bill for the services they provide. With the potential of several parties involved in providing services, there are several possible billing scenarios. Following are the more common examples. For each option of providing services and billing, there are inherent issues regarding medical responsibility and liability.

Billing for taking the x-rays. Many practitioner and x-ray labs only produce the radiographic study. In these cases the billing is only for the technical component. CPT codes are only used singly or preferably with a modifier of 'TC'. HCFA guidelines implemented in 1992 required the use of the modifier 'TC' when billing for the technical component. (Medicare bulletin) presently codes
used are in the range of 70000 to 79999, or 70000TC to 79999TC. Variations are used by some worker's compensation divisions that use codes unique to their programs.

Billing for general practitioner involvement. The referring practitioner provides significant services when determining which patients required studies and when they determine the significance of the findings outlined by the radiology report. Billing for this service is reflected, along with other services, in the Evaluation and Management Codes at the level provided. Billing codes are reflected in the series of 99201 to 99215.

Billing for providing the formal written radiology report. The majority of radiologists bill for providing the radiology report separate from other procedures. When billing in this manner the radiologist's bill is for the Professional component. The code for reading the x-ray and providing the written report use the CPT code for the study with use of '26' as modifier, 7000026 to 7999926.

Billing for global services. Another option in chiropractic practice is that the facility may produce the study as well as provide the formal written radiology report. In these circumstances billing may be done as a global fee. This includes both the technical and professional component. In some instances all services are provided in that one facility. In other instances, some clinics contract with radiologists to provide services and the clinic submits fees to cover the professional component. Chiropractors are aware that in no circumstance is fee-splitting allowed. Gaining profit based on another physician's services is unethical and illegal in most circumstances. The 'markup' charged by the referring doctor for outside professional x-ray interpretation does not exceed actual costs to the clinic. CPT codes are used with no modifier. Radiology services are recognized as significant clinical services by doctors, attorneys, the public and all insurance programs throughout the United States. Insurers and private patients place a compensable value on radiologic technical charges and on the professional services performed by radiologists.

See Table 5.

UTILIZATION REVIEW

Understanding the process of utilization review allows the practitioner to better communicate with third party payers. The following discussion covers issues that will help ensure fair case review.

Services
Federal regulations state that radiography (in chiropractic practice) is to be used solely for diagnostic purposes. Public Law 97-35, sec. 978 states that the purpose of imaging studies must be to reach a diagnostic conclusion in all cases.

The present standard of care requires: 1) studies obtained based on clinical need, 2) images must be of adequate diagnostic quality, 3) A formal written radiology report outlining the radiographic findings and radiographic diagnosis, and 4) integration of this information with the patient case. (Peterson) Reviewers should accept only those studies performed to meet all four standards.
Manipulation of the CPT codes to gain higher reimbursement is discouraged. Radiology procedures or groups of procedures are billed in an available single, comprehensive CPT code. Body areas are billed as a series or study. Chiropractors understand that the method of billing of individual views when more than one view is obtained is considered unbundling. Discouraged are methods of performing partial studies on various office visits to allow code gaming and higher reimbursement.

Incomplete and/or suboptimal series are performed for a variety of reasons, including: poor patient cooperation, the body habitus of the patient, inferior imaging equipment, technical factors with film, processing errors, technologist errors or incomplete, and reluctance to demand better. Little can be done about the patient causes of poor studies. The other reasons can be remedied. Reviewers should not accept, but deny studies not performed to acceptable standards.

Overhead expenses do not justify billing of an unusable radiograph. Insurance policies uniformly provide for payment of "necessary" medical expenses. A radiograph that provides no meaningful diagnostic information is not "necessary" and should not be billed to an insurer. Nor should private pay patients be required to pay for services from which they derive no benefit.
Table 5. Explanation of services provided in diagnostic imaging including description, CPT codes and required documentation.

**BILLING PROCEDURES IN RADIOLOGY**

<table>
<thead>
<tr>
<th>Name of Service</th>
<th>Service Provided</th>
<th>Explanation</th>
<th>CPT Codes</th>
<th>Required Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering study</td>
<td>Ordering x-rays</td>
<td>Included as part of E/M code for office visit</td>
<td>99201-99205 99211-99215</td>
<td>Case notes &amp;/or prescription</td>
</tr>
<tr>
<td>Technical component</td>
<td>Produce x-rays</td>
<td>Use specific CPT code for the series, singly or prefer modifier &quot;-TC&quot;</td>
<td>70000-79999 or with modifier ex. 72050 or 72050-TC</td>
<td>Films that were produced, maybe logbook</td>
</tr>
<tr>
<td>Professional Component</td>
<td>Interpretation with written radiology report</td>
<td>Use specific CPT code for the series ordered with the &quot;-26&quot; modifier</td>
<td>70000-26 to 79999-26, note modifier</td>
<td>Separate written / signed report</td>
</tr>
<tr>
<td>Global billing</td>
<td>Technical plus professional component</td>
<td>Use specific CPT code for the series</td>
<td>70000-79999 without modifier</td>
<td>Films that were produced plus written/signed report</td>
</tr>
<tr>
<td>Secondary consultation</td>
<td>Second opinion interpretation with written report</td>
<td>NOT usually performed</td>
<td>76140</td>
<td>Separate written report</td>
</tr>
<tr>
<td>Level of E/M Service</td>
<td>Integration of information from x-ray study with patient case</td>
<td>Added level of service</td>
<td>Included in 99201-99205 99211-99215</td>
<td>Brief rotation in patient file</td>
</tr>
</tbody>
</table>
Utilization

One must consider the potential of overuse of x-rays. Whether a radiograph or other study is warranted in a particular situation is usually determined by the practitioner based on clinical need. The patient records usually contain the necessary information indicating the need for studies. Repeat radiography of patients is performed only with significant clinical indication, as determined by the treating chiropractic physician.

A requirement for demonstrated radiological abnormality or clinical proof of diagnosis to substantiate claims for radiological services would jeopardize the proven and proper use of diagnostic imaging in the detection of suspected disease or injury, and in the evaluation of treatment. Denial of claims because the exam findings proved to be "negative" would be a marked disservice to the provision of good patient care. Such exams are expressly obtained for the purpose of ruling in or ruling out a variety of abnormalities.

Decisions of necessity and appropriateness of radiologic services are prerogatives of the primary physician. A radiologist who provides a requested service as a result of referral may be subject to review of the service quality and cost, but not to review of the utilization of these services.

A physician who both requests and performs radiological services on a self-referral basis should be subject to the review of utilization as well as of the quality and the cost of these services. This is patterned after similar review of other types of services.

It is not reasonable to expect a consultant radiologist, practicing competently on a referral basis, to be subject to retroactive denial of claims for services performed in good faith.

Studies should be performed in a timely manner. This is also true for documentation of the radiographic findings and the radiographic diagnosis. In most instances the performance of these services are not required to be simultaneous. Therefore, denial of the professional component is not appropriate based on timing in relation to initiation of therapy.

The potential of causation of damages by the reviewer must be avoided. The present standard of care reflects quality films and a formal written radiology report outlining the radiographic findings and radiographic diagnosis. Denial of either component of these necessary services by the reviewer may be considered causation for any untoward result that may occur to the patient.

Fees and Billing
A reminder of the breakdown of the radiology services will help in the understanding of the procedural terminology and fee review.

\[
\text{Technical component fee (taking x-rays)} + \\
\text{Professional component fee (reading x-rays)} = \\
\text{Total radiology services (Global fee)} \\
\text{Sometimes billable with office visit is} \\
\text{Evaluation and Management for general practitioner involvement}
\]
Fees for services are to be consistent with the level of service provided. The practice of altered fee schedules based on the amount of insurance pay is considered unprofessional conduct in most states.

Billing schemes that do not reflect accurate reporting of services provided should be investigated. Billing for global component without having both performed the study and having on file a formal written radiology report is fraudulent.

Chiropractors are aware that it is unethical to receive kickback payments for ordering studies. (ACR) Safe harbor regulations define strict regulations regarding ownership, limited partnerships and stock purchases in imaging facilities or centers. (Brice)

Overbundling tactics by carriers is considered unprofessional. These tactics clearly restrict freedom of choice in independent practice. It alters appropriate medical decision-making and denies subscriber's access to a higher standard of care by indirectly discouraging access to a specialist. Third party manipulation of procedure codes to affect reimbursement is not acceptable. Uniform guidelines should be followed.

CONCLUSION

Each diagnostic study entails many components. There is potential for involvement of a variety of individuals in production and interpretation of diagnostic images. Each individual is responsible for the services he/she provides in terms of appropriateness, quality and billing for services. Utilization review is a method of evaluating these services and helps to ensure meeting standards of care.

ASSESSMENT CRITERIA

Procedure Ratings
1. ESTABLISHED: Accepted by the profession for use in given circumstances.
2. PROMISING: Appears to be appropriate for use in given circumstances, (research and experiences agree on usefulness) but more experience and research are needed to ensure utility.
3. INVESTIGATIONAL: Evidence is insufficient or conflicting on appropriateness. Use should be limited to application in the research environment.
4. DOUBTFUL: Current literature suggests procedure is inappropriate for desired application. Additional research may change this to either Investigational or Unacceptable.

Quality of Evidence
CLASS I: Evidence based on well-designed clinical trials or other randomized, blinded studies. Addresses reliability, validity, positive predictive value, etc.
CLASS II: Evidence based on well-designed clinical case control, retrospective blinded, intra- and inter-rater reliability studies. Addresses sensitivity, specificity, etc.
CLASS III: Evidence based on well-documented observational case studies, case series, literature reviews, consensus and expert opinion.
LIST OF RECOMMENDATIONS FOR EACH SUB-TOPIC

SEQUENCE OF SERVICES
The general practitioner, in most instances, is the person that initiates a radiographic study. The study is performed by the technologist or qualified person in a safe environment in a manner consistent with published guidelines regarding quality and performance. In many instances the diagnostic study is available to the referring practitioner for screening. This is not a requirement, but is often performed by the conscientious practitioner as part of office procedures. The standard of care in diagnostic imaging is that all studies are viewed for interpretation to obtain the maximum level of diagnosis which is achievable based on the type of study performed. Standard and customary billing procedures are followed.

RATING: Established
EVIDENCE: Class III

RADIOLOGY EDUCATION
Education is available for the technologist. Chiropractic education prepares the chiropractor to practice as a general practitioner as a portal of entry care provider. This education enables the practitioner to be judged responsible at the level of general practice. The chiropractic radiologist is a graduate doctor of chiropractic who has continued postgraduate education. This chiropractic physician is then considered to be a specialist in radiology.

RATING: Established
EVIDENCE: Class II, Class III

RADIOLOGY SPECIALTY PRACTICE
The specialty of chiropractic radiology with full-time residency training is now well established and has resulted in the elevation of practice standards. An increasing number of board certified radiologists (D.A.C.B.R.) are establishing independent practices of radiology. There is evidence to suggest that radiologists can reduce the number of false positive and false negative interpretations that occur in the outpatient setting. A radiologist's assistance in the acquisition of advanced imaging can reduce cost, improve diagnostic yield and expedite proper management.

RATING: Established
EVIDENCE: Class II and Class III

PATIENT SELECTION PROCEDURES
The acquisition of diagnostic imaging studies is the result of a carefully performed history, physical and regional evaluation and adherence to cost/benefit exposure ratios. The decision to use imaging is based on sound clinical reasoning and the likelihood that significant information can be obtained from the study with respect to diagnosis, prognosis and therapy.

RATING: Established
EVIDENCE: Class I, II and III

VERTEBRAL SUBLUXATION COMPLEX (VSC)
One of the many patient features that chiropractors recognize during examination, diagnosis, treatment and patient management, is called the subluxation complex. Imaging does play a role regarding some of the features of
the subluxation complex. Diagnostic imaging assists the chiropractor in recognizing patient status and assists in determining plans of action in reaching therapeutic and preventative goals. Imaging is used to characterize the components of the VSC when such characterization is necessary to render chiropractic care. Imaging may be indicated if less hazardous or less expensive alternative examinations are not available or conclusive. These parameters apply to the biomechanical, pathological and pathophysiological components of the VSC.

RATING: Established
EVIDENCE: Class I, II and III

RADIOGRAPHIC INTERPRETATION AND REPORTING
All chiropractic radiographic studies are performed to reach a diagnostic conclusion. (Public Law) Formal interpretation and reporting of each imaging study documents the findings. A written (usually typed) interpretation of the imaging study is included as part of the patient's permanent medical record.

RATING: Established
EVIDENCE: Class II and III

DOCUMENTATION
Documented results of imaging studies become an integral part of the patient file. All diagnostic imaging studies must have a written report to document the radiological findings. In the legal sense, this proves the interpretation was performed. The report provides a document for medical communication. Reports should include patient identification, location where studies were performed, study dates, types of studies, views interpreted, radiographic findings, diagnostic impressions, name of the individual performing the interpretation, and a signature, including professional qualifications. A unique radiology report should be generated for each study. Use of checklist forms is not recommended. Forms of this type invite criticism as prepackaged income assisting devices rather than intelligent, well-analyzed, individualized radiology reports. (Ladenheim, 1988) Credibility is at risk when all files are supplied with identical checklist forms rather than individualized reports.

RATING: Established
EVIDENCE: Class I, II and III

LEGAL ISSUES IN RADIOLOGY
Federal regulations state that radiography (as applied to chiropractic practice) is to be used solely for diagnostic purposes. (Public law 97-35 sec.978) The purpose of the study must be to reach a diagnostic conclusion in all cases.

The National Council on Radiation Protection has established recommendations for the safe and effective use of diagnostic radiology. The laws and regulations governing the use of diagnostic radiology are established by individual state radiation protection authorities.

Levels of medical responsibility and malpractice conform to standards of care; individuals or institutions are responsible to the level of service provided. Causation as applied to medical malpractice considers adherence to the accepted professional standard of care. Vicarious liability means that a party is liable because some other person whom he had the power to direct or control committed a negligent act.
INFORMED AUTHORIZATIONS
There are three basic prerequisites for informed consent: 1) the patient must have the capacity to reason and make judgements, 2) the decision must be made voluntarily and without coercion, and 3) the patient must have a clear understanding of the risks and benefits. Typical requirements for authorization in chiropractic radiology include: 1) patient consent to x-ray, 2) consent to x-ray a minor child, 3) verification of not-pregnant 4) Medicare release, and 5) release of records.

STANDARDS OF BILLING
Radiology services are recognized as significant medical services by individuals as well as the public and all insurance programs throughout the United States. Insurers and private patients place a compensable value on radiologic technical charges, general practitioner involvement and on the professional services rendered by radiologists.

RADIATION TECHNOLOGY AND PROTECTION
Chiropractors keep the radiation exposure to patients at a minimum. This includes the use of modern equipment and techniques. A radiograph worth acquiring is worth repeating if it is suboptimal. The debate over whether to expose a patient to more radiation is only valid before the series is ordered. Once committed to the acquisition of a series, the facility is obligated to produce as high quality a radiograph as possible.

UTILIZATION REVIEW
The potential of causation of damages by the reviewer must be avoided. The present standard of care reflects quality films and a formal written radiology report outlining the radiographic findings and radiographic diagnosis. Reviewers should not accept, but deny, studies not performed to acceptable standards.

SUMMARY
Imaging has been and continues to be pivotal in the evaluation of chiropractic patients and remains an important tool. It is important to consider the deleterious effects and cost of imaging prior to reacquiring a study. The critical issue centers on the need for the study. The chiropractor is faced with a patient that presents with a constellation of historical, physical and
laboratory findings, all which suggest a tentative clinical opinion or diagnosis. The chiropractor at this point must decide if imaging will be needed for each patient. Diagnostic imaging procedures aid the chiropractor in evaluation, diagnosis and patient cash management.

Imaging continues to be valuable in the detection and evaluation of numerous musculoskeletal, soft tissue and central nervous system disorders. In instances where the subluxation complex alters the function or structure of body components, diagnostic imaging may be useful in detecting these changes.

It is prudent for the clinician to regularly consult a radiologist. The ever present threat of litigation as well as the complexities of imaging demand the input of a trained expert. The radiologist provides a service in documenting the findings of the studies, as well as assisting in the acquisition of the most appropriate imaging studies when they are necessary.

Each individual is responsible for the services they provide in terms of appropriateness, quality and billing for services. Levels of medical responsibility and malpractice conform to standards of care. Individuals or institutions are responsible to the level of service provided. Adequate technology is the responsibility of the technologist and the facility providing the services. Radiologic diagnosis is achieved at the level of the general practitioner and the specialist.

There is certainly a multiplicity of factors and personnel involved in the production and interpretation of radiographic images. This document attempts a reflection of current chiropractic practice. Today there is a heightened awareness of the need for good understanding and accountability of all practitioners in managed care, intra-professional peer review, and interactive claims management used by public and private sector purchasers. This demand for accountability underscores the need to understand the parameters of radiology. We have provided this document for dissemination of this information throughout the profession.

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National Council on Radiation Protection (NCRP) #23


Public Law. 97-35 sec.978


