# Course Change Proposal

**Form A**

<table>
<thead>
<tr>
<th>Academic Group (College):</th>
<th>Academic Organization (Department):</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and Human Services</td>
<td>Physical Therapy</td>
<td>2/4/2011</td>
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</tbody>
</table>

**Type of Course Proposal:**

<table>
<thead>
<tr>
<th>New <em>x</em></th>
<th>Change ___</th>
<th>Deletion ___</th>
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**Department Chair:**

Dr. McGinty

**Submitted by:**

Dr. McKeough

**Does this course fulfill a requirement for single-subject or multiple subject credential students?**

<table>
<thead>
<tr>
<th>Yes ___</th>
<th>No <em>x</em></th>
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**For Catalog Copy:**

<table>
<thead>
<tr>
<th>Yes <em>x</em></th>
<th>No ___</th>
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**CCE (Extension):**

<table>
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<tr>
<th>Yes ___</th>
<th>No <em>x</em></th>
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**Semester Effective:**

Fall _x_  Spring __, 2012

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
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<tbody>
<tr>
<td>PT 634</td>
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| Title: Diagnostic Imaging for Physical Therapy |
| Units: 2 |

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This course replaces experimental course Subject Area *(prefix)* and Catalog Nbr *(course number)*:

<table>
<thead>
<tr>
<th>Yes ___</th>
<th>No ___</th>
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If changing an existing course, should new version be considered a repeat of the original version? If so, the same Course ID will be maintained. If not, a new Course ID will be assigned. Note: In PeopleSoft terminology, the Course ID is the unique system identifier, not the Catalog Nbr.

<table>
<thead>
<tr>
<th>Change from:</th>
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<tbody>
<tr>
<td>Subject Area <em>(prefix)</em> &amp; Catalog Nbr <em>(course no.)</em>:</td>
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</table>

| Title: |
| Units: |

| Change to: |
| Subject Area *(prefix)* & Catalog Nbr *(course no.)*: |

| Title: |
| Units: |

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**JUSTIFICATION:**

This is a new course developed to meet the accreditation requirements for the Doctor of Physical Therapy degree.

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**NEW COURSE DESCRIPTION:** *(Not to exceed 80 words, and language should conform to catalog copy. See http://www.csus.edu/umanual/acad.htm - Guidelines for Catalog Course Description)*

This course provides an overview of imaging techniques commonly used in radiology and their implications to the role of physical therapists in professional practice. The role of imaging techniques in the diagnostic and intervention-planning processes for physical therapists is presented. *Open to Physical Therapy majors only.*

<table>
<thead>
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<th>Note:</th>
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| Prerequisite: BIO 633, PT 600, PT 602, PT 604, PT 606, PT 608, PT 630, PT 614, PT 618, PT 620, PT 622 |
| Enforced at Registration: Yes _x_ No |

| Corequisite: PT 632, PT 636, PT 638 |
| Enforced at Registration: Yes _x_ No |

| Graded: Letter _x_ Credit/No Credit |
| Instructor Approval Required? Yes _x_ No |

| Course Classification *(e.g., lecture, lab, seminar, discussion)*: Lecture C-O2 |
| Title for CMS (not more than 30 characters) |

| PT 632 Diag Imaging for PT |

| Cross Listed? |
| Yes _x_ No |

If yes, do they meet together and fulfill the same requirement, and what is the other course.

| How Many Times Can This Course be Taken for Credit? 1 |

| Can the course be taken for Credit more than once during the same term? Yes _x_ No |

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FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

**Description of the Expected Learning Outcomes**: Describe outcomes using the following format: “Students will be able to: 1), 2), etc.” See the example at http://www.csus.edu/acaf/example.htm

At the completion of this course, the student will be able to:

**Goal 1.0: Demonstrate Professional Effectiveness**

1.1 Compare and contrast normal biological, physiological, and psychological mechanisms of the human body with pathophysiological factors that lead to impaired body functions and structure.
   1.1.2 Describe how pathological processes affect normal function.
       1.1.2.1 Gain basic knowledge and practical experience in the multiple facets of diagnostic imaging.
       1.1.2.2 Gain basic knowledge of the physics, technology and techniques for acquiring, viewing and interpreting imaging studies.
       1.1.2.3 Know the advantages and shortcomings of commonly used imaging technologies.
       1.1.2.4 Use radiology consultation and imaging data to understand the nature of pathology and to develop appropriate intervention plans.
       1.1.2.5 Use imaging information to recognize pathology that requires referral to another health care professional.
       1.1.2.6 Relate imaging data to pathology and clinical findings commonly encountered in physical therapy practice

1.2 Determine the physical therapy needs of any individual seeking services.
   1.2.3 Perform an effective and efficient systems review screen.
       1.2.3.1 Correctly identify the following types of imaging studies: plain film radiography, computed tomography (CT), magnetic resonance imaging (MRI), ultrasonography (US), radionuclide scintigraphy (bone scan).
       1.2.3.2 Know the projections and positions commonly used for plain-film radiography.
       1.2.3.3 Distinguish between air, fat, water, bone, contrast media and heavy metals on imaging studies.
       1.2.3.4 Orient imaging studies correctly on the viewer.
       1.2.3.5 Use the A-B-C-s system (Alignment – Bone Density – Cartilage Space – Soft Tissues) to Systematically evaluate plain film radiographs of musculoskeletal structures.
       1.2.3.6 Use systematic scanning methods for the following regional imaging studies: spine, brain, chest, abdomen.

1.4 Implement the physical therapy plan of care designed to restore and/or maintain optimal function applying selected procedural interventions that demonstrate safe and effective psychomotor and clinical reasoning skills.
   1.4.1 Perform efficient and effective procedural interventions utilizing evidence-informed physical therapy procedures in a competent manner.

**Goal 2.0: Demonstrate Professional Behaviors**

2.2 Communicate effectively for varied audiences and purposes.
   2.2.1 Demonstrate effective interpersonal (verbal, nonverbal, electronic) communication skills considering the diversity of populations and environments.
   2.2.2 Facilitate therapeutic communication and interpersonal skills.
   2.2.3 Discuss difficult issues with sensitivity and objectivity.
   2.2.4 Appropriately utilize communication technology efficiently, professionally, and effectively.
   2.2.5 Respect roles of support staff and communicate appropriately.

2.4 Recognize the need for personal and professional development.
   2.4.1 Participate in self-assessment to improve clinical and professional performance.
   2.4.2 Welcome and seek new learning opportunities.
   2.4.3 Assume responsibility for professional lifelong learning.
   2.4.4 Accept responsibility and demonstrate accountability for professional decisions.
   2.4.5 Recognize own biases and suspend judgments based on biases.

2.5 Demonstrate entry level generic abilities.
   2.5.1 Professional accountability and commitment to learning.
   2.5.2 Recognition of one’s own limitations
   2.5.3 Effective use of constructive feedback
   2.5.4 Effective use of time and resources
   2.5.5 Demonstrate integrity, compassion, and courage in all interactions

**Goal 3.0: Practice in an Ethical and Legal Manner**

3.1 Practice physical therapy in a manner consistent with established legal and professional standards.
   3.1.2 Practice within all applicable regulatory and legal requirements

**Goal 4.0: Demonstrate Scholarship**

4.1 Apply basic principles of statistics and research methodologies within the practice of physical therapy.
   4.1.1 Formulate and reevaluate positions based on the best available evidence.
**Develop a conceptual framework for clinical practice.**

**Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean’s office, not Academic Affairs.**

**Assessment Strategies:** A description of the assessment strategies (e.g., portfolios, examinations, performances, pre- and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

There is one course assignment, which is an objective question exam (multiple choice, true/false, matching, etc.). The exam questions are based on the lecture and reading materials. The student is expected to synthesize the course materials and meet the course goals and objectives to successfully complete the assignment. The student must achieve a score of 80% on the assignment to pass the course. The student is expected to **COMPLETE THE ASSIGNMENT INDIVIDUALLY AND ADHERE TO THE UNIVERSITY POLICY ON ACADEMIC HONESTY.** The student may use the course materials and as much time as needed to complete the assignment.

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<table>
<thead>
<tr>
<th>For whom is this course being developed?</th>
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<tbody>
<tr>
<td>Majors in the Dept. <em>x</em></td>
</tr>
<tr>
<td>Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes <em>x</em> No</td>
</tr>
<tr>
<td>If yes, identify program(s):</td>
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</tbody>
</table>

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes ____ No _x_

If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any). _____ Physical Therapy

**The Department Chair’s signature below indicates that affected programs have been sent a copy of this proposal form.**

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**Approvals:** If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

<table>
<thead>
<tr>
<th>Signatures:</th>
<th>Date</th>
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<tbody>
<tr>
<td>Department Chair:</td>
<td>8-16-11</td>
</tr>
<tr>
<td>College Dean or Associate Dean:</td>
<td></td>
</tr>
<tr>
<td>CPSP (for school personnel courses ONLY)</td>
<td></td>
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<tr>
<td>Associate Vice President and Dean for Academic Programs</td>
<td></td>
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**Distribution:** Academic Affairs (original), Department Chair and College Dean. Dean’s office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent.

9/10/2008
PT 634 Diagnostic Imaging for Physical Therapists

Summer Semester

COURSE CREDIT: 2 units: 2 lecture hours

INSTRUCTOR: TBA
OFFICE: 
OFFICE HOURS: 
TELEPHONE: 
E-MAIL: 

CLASSROOM: TBA

TIME: TBA

COURSE DESCRIPTION
This course provides an overview of imaging techniques commonly used in radiology and their implications to the role of physical therapists in professional practice. The role of imaging techniques in the diagnostic and intervention-planning processes for physical therapists is presented. Open to Physical Therapy majors only.

PREREQUISITES:
BIO 633 Human Gross Anatomy for Physical Therapists
PT 600 Pathokinesiology
PT 608 PT/Patient/Professional Interactions
PT 630 Pathophysiology
PT 602 Evidence Informed Practice I
PT 604 Principles of Human Movement
PT 606 Therapeutic Measurements and Techniques
PT 614 Neuroscience for Physical Therapists
PT 618 Foundations for Patient Management
PT 620 Physical Therapy Interventions I
PT 622 Evidence Informed Practice II

CO-REQUISITES:
PT 632 Diagnostic Imaging for PT
PT 636 Geriatrics/Gerontology for PT
PT 638 Health, Wellness, & Ergonomics in PT

REQUIRED TEXTS/ REFERENCES:
Other Useful Resources:
- X-Ray 2000  www.xray2000.co.uk
- University Hospitals of Cleveland Department of Radiology Teaching Files  http://www.uhrad.com/Default.htm
- The Whole Brain Atlas http://www.med.harvard.edu/AANLIB/home.html

NOTE: A thorough appreciation of three-dimensional anatomy is needed. An anatomy atlas with axial (transverse) views can be invaluable as an anatomy review tool. Here is an on-line resource that may be helpful: Loyola University of Chicago, Stritch School of Medicine http://www.lumen.luc.edu/lumen/meded/grossanatomy/x_sec/mainx_sec.htm

COURSE OBJECTIVES: (Referenced to Program Educational Goals and Related Objectives)
At the conclusion of this course, the student is expected to:

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    1.2.3.6 Use systematic scanning methods for the following regional imaging studies: spine, brain, chest, abdomen.
    1.2.3.7 Demonstrate an understanding of the radiologist’s report.

1.4 Implement the physical therapy plan of care designed to restore and/or maintain optimal function applying selected procedural interventions that demonstrate safe and effective
psychomotor and clinical reasoning skills.

1.4.1 Perform efficient and effective procedural interventions utilizing evidence-informed physical therapy procedures in a competent manner.

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4.1.1.1 Develop a conceptual framework for clinical practice.

**TEACHING STRATEGIES AND LEARNING ACTIVITIES**

This is an internet-based course. Case-method teaching, lecture by instructors and/or guests, demonstration, instructional videos, discussion groups, reading assignments, internet assignments, multiple writing assignments.

**ATTENDANCE**

Daily attendance and timeliness is expected. Courtesy and professional responsibility requires notification of the instructor for any absence in advance. Failure to notify the professor of an absence can result in lowering your participation grade and is considered unprofessional.
Students are responsible for any missed work and may be required to complete make-up assignments.

ACADEMIC HONESTY
The university policy regarding academic honesty is in effect in this course and any alleged violations will be handled in accordance with the policies described in the University Catalogue. (www.csus.edu/admbus/umanual/UMA00150.htm)

BEHAVIORAL EXPECTATIONS
Students are responsible for appropriate behaviors as defined by the generic abilities. Failure to comply with behavioral expectations during class may result in a student first being warned that behavior is inappropriate, then, if inappropriate behavior continues, a student may be asked to leave a class. Repeated failure to comply with behavioral expectations can lead to failure in the course. Cell phones and beepers should be off or silent (set to vibration mode) during the class. No text messaging is permitted in class.

SPECIAL ACCOMMODATIONS
During the course of the year, some students may utilize prearranged accommodations. If you are a student with a learning disability, physical disability, or other special needs, please let me know as soon as possible if you need special accommodation. These kinds of confidential discussions are best handled during my office hours or by special appointment. You can expect confidentiality and cooperation regarding any circumstances and needs that have been verified though the Office of Services to Students with Disabilities (SSWD) Lassen Hall 1008, (916) 278-6955.

ASSIGNMENTS: (For details see Assignments on the Homepage)

ASSESSMENT/ASSIGNMENTS
There is one course assignment, which is an objective question exam (multiple choice, true/false, matching, etc.). The exam questions are based on the lecture and reading materials. The student is expected to synthesize the course materials and meet the course goals and objectives to successfully complete the assignment. The student must achieve a score of 80% on the assignment to pass the course. The student is expected to COMPLETE THE ASSIGNMENT INDIVIDUALLY AND ADHERE TO THE CSUS EXPECTATIONS FOR ACADEMIC HONESTY. The student may use the course materials and as much time as needed to complete the assignment.
GRADING SCALE:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent</th>
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<tbody>
<tr>
<td>A</td>
<td>93 -100%</td>
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<tr>
<td>A-</td>
<td>90 – 92%</td>
</tr>
<tr>
<td>B+</td>
<td>87 - 89%</td>
</tr>
<tr>
<td>B</td>
<td>83 – 86%</td>
</tr>
<tr>
<td>B-</td>
<td>80 – 82%</td>
</tr>
<tr>
<td>C+</td>
<td>76 – 79%</td>
</tr>
<tr>
<td>C</td>
<td>73 – 76%</td>
</tr>
<tr>
<td>C-</td>
<td>70 – 72%</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69%</td>
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<tr>
<td>F</td>
<td>59% &amp; below</td>
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COURSE OUTLINE

A. COURSE OVERVIEW

B. THE COURSE
   a. PART I – Imaging Principles
      i. Segment I – Introduction to Imaging
      ii. Segment II – Computed Tomography
      iii. Segment III – Magnetic Resonance Imaging
      iv. Segment IV – Redionuclide Scintigraphy
      v. Segment V – Ultrasonography
   b. Part II – Imaging for Musculoskeletal Structures
      i. Segment I – Systematic Scanning
      ii. Segment II – Upper Extremity
      iii. Segment III – Lower Extremity
      iv. Segment IV – Cervical Spine
      v. Segment V – Thoracic Spine
      vi. Segment VI – Lumbo-sacral spine
   c. Part III – Brain
      i. Segment I – Brain Imaging
   d. Part IV – Chest
      i. Segment I – Chest Imaging
      ii. Segment II – Cardiac and Vascular Imaging
   e. Part V – Abdomen
      i. Segment I – Abdominal Imaging
   f. Part VI – Radiologist’s Report
      i. Segment I – The Radiologist’s Report

Please note that this syllabus may be changed at any time at the discretion of the Instructor with prior notification of students.
Imaging Principles

1. Which density appears most white on plain film radiographs?
   a. air
   b. fat
   c. muscle
   d. bone

2. Muscles are which color on plain film radiographs?
   a. black
   b. almost black
   c. gray
   d. white

3. A Left Lateral Decubitus Abdominal Study means that the x-ray beam traveled through the patient . . .
   a. from left to right
   b. from anterior to posterior or from posterior to anterior
   c. in axial slices
   d. from right to left

4. An oblique projection means that the x-ray beam traveled through the patient in which plane?
   a. sagittal
   b. coronal
   c. transverse
   d. none of the above

5. When oriented on the viewer, anterior-posterior and posterior-anterior projections should be oriented . . .
   a. so that the observer views the image from the perspective of the x-ray emitter
   b. as if the patient were facing the observer
   c. both are correct
   d. neither are correct

6. When oriented on the viewer, lateral projections should be oriented . . .
   a. so that the observer views the image from the perspective of the x-ray emitter
   b. as if the patient were facing the observer
   c. both are correct
   d. neither are correct
When oriented on the viewer, anterior-posterior and posterior-anterior views of the hands and feet should be oriented . .

a. so that the observer views the image from the perspective of the x-ray emitter
b. as if the patient were facing the observer
c. as if the observer were looking at the dorsal aspects of the observer's hands or feet
d. with the fingers or toes pointing downward

7. The advantages of a PACS imaging system over a modern film-based imaging system include all of the following EXCEPT . . .

a. reduced exposure to ionizing radiation
b. reduced need for image storage space
c. ability to manipulate images for special views
d. instantaneous image transmission to anywhere

8. Because of the magnification phenomenon, which chest projection can make the cardiac silhouette incorrectly appear enlarged?

a. Anterior-posterior
b. Posterior-anterior
c. Neither of the above
d. Both of the above

9. How many views are needed to perceive three dimensions?

a. 1
b. 2
c. 3
d. 4
10. Assuming that this film is oriented on the viewer according to standard conventions, which knee is this?
   a. right
   b. left

11. Which imaging modality is the best choice for seeing a tear in the anterior cruciate ligament?
   a. plain film radiograph
   b. radionuclide sictigraph
   c. MRI
   d. Ultrasonograph

12. Which imaging modality is the best choice for seeing a stress fracture that is less than one week old?
   a. plain film radiograph
   b. radionuclide sictigraph
   c. MRI
   d. Ultrasonograph

13. Which imaging modality would be safest for examining the abdomen of a pregnant woman?
   a. plain film radiograph
   b. radionuclide sictigraph
   c. MRI
   d. Ultrasonograph
14. What is the name of the projection for a radiograph of the pelvis taken in this manner?
   a. Decubitus
   b. Anterior-posterior
   c. Lateral
   d. Posterior-anterior

15. Which MRI technique is best for imaging soft tissues?
   a. T1
   b. T2

16. Which of the following studies would be best for imaging the wall of the colon?
   a. plain film radiograph
   b. intravenous contrast study
   c. single contrast barium enema
   d. double contrast barium enema

17. Which of the following imaging modalities uses the same radiodensities as plain film radiography?
   a. ultrasonography
   b. magnetic resonance imaging
   c. radionuclide scintigraphy
   d. computed tomography

18. Is this axial CT image oriented correctly?
   a. yes
   b. no
19. Approximately how many Hounsfield Units is the abnormality within the circle?
   a. +500
   b. +250
   c. 0
   d. -500

20. The studies show normal lung ventilation and decreased perfusion. What is the most likely diagnosis?
   a. chronic obstructive pulmonary disease
   b. asthma
   c. pulmonary edema
   d. pulmonary embolus
21. What is your diagnosis?
   a. arthritis
   b. fracture
   c. metastasis
   d. normal scan
22. What is the diagnosis?
   a. sub-arachnoid hemorrhage
   b. intra-parenchymal hemorrhage
   c. skull fracture
   d. epidural hematoma

23. Hypoinflation on an upright P-A chest film should be considered when the dome of the hemidiaphragm is at which posterior rib level?
   a. 7
   b. 8
   c. 9
   d. 10

24. Axial computed tomography images should be oriented . . .
   a. as if the patient was facing the observer
   b. as if the observer were at the foot of the patient’s bed looking toward the patient’s head
   c. posterior to anterior
   d. so the view is sagittal

25. Scout views are used to . . .
   a. identify suspected pathology
   b. as a screening tool
   c. locate a particular axial CT or MR image in the patient’s anatomy
   d. none of the above

26. Which Hounsfield Unit value represents the density of water?
   a. -1000
   b. 0
   c. +400
   d. +1000
27. Which Hounsfield Unit value is in the range of the density of many soft tissues?

   a. -500  
   b. -100  
   c. 0  
   d. +45

28. Which of the following types of imaging studies is the most common initial study for head trauma?

   a. plain film radiograph  
   b. MRI  
   c. CT  
   d. Ultrasonograph

29. Which of the following imaging technologies manipulates the orientation of hydrogen protons to create the image?

   a. radiography  
   b. CT  
   c. Radionuclide scintigraphy  
   d. MRI

30. Which imaging modality would be contraindicated for the person with implanted ferromagnetic material implanted?

   a. radiography  
   b. CT  
   c. Radionuclide scintigraphy  
   d. MRI

31. What structure is this?

   a. Circle of Willis  
   b. Inferior vena cava  
   c. Cardiac arteries  
   d. Creature from outer space
32. Which image is the MR Angiography?
   a. Fig. 4
   b. Fig 5

33. Which imaging system uses gamma emissions to formulate the image?
   a. Radiography
   b. Radionuclide scintigraphy
   c. CT
   d. MRI

34. Which imaging modality was used to produce this image of a metatarsal stress fracture?
   a. Radiography
   b. Radionuclide scintigraphy
   c. CT
   d. MRI

35. What sort of image is this?
   a. radiograph
   b. CT
   c. Ultrasonograph
   d. Radionuclide scintigraphy

Musculoskeletal

Systematic Scanning
36. Which of the musculoskeletal systematic scanning principles is most obviously violated in this radiograph of the femur?

a. Alignment
b. Bone density
c. Cartilage spaces
d. Soft tissues

Upper Extremity

37. Based on this single radiograph, what is the most urgent diagnosis?

a. dislocated gleno-humeral joint
b. separation of acromio-clavicular joint
c. degenerative arthritis
d. non-displaced fracture neck of humerus

38. The clinician suspects damage to the rotator cuff. Which of the following imaging studies is most appropriate?

a. CT
b. MRI
c. Bone scan
d. Plain radiograph
39. Using the A-B-C-s systematic scanning method, which is the most obvious problem?
   a. alignment
   b. bone density
   c. cartilage space
   d. soft tissues

Lower Extremity

40. When a pelvic ring fracture is identified, what else is most likely?
   a. degenerative arthritis
   b. rheumatoid arthritis
   c. a second fracture of the pelvic ring
   d. dislocation of the S-I joints

41. What is your diagnosis?
   a. slipped capital femoral epiphysis
   b. intertrochanteric fracture
   c. Paget’s Disease
   d. Avascular necrosis of the femoral head
42. The most obvious problem is . . .
   a. fracture
   b. loss of cartilage space
   c. dislocation
   d. soft tissue abnormality

43. The best imaging system for identifying a suspected metatarsal stress fracture is . . .
   a. MRI
   b. Plain film radiograph
   c. Ultrasound
   d. Bone scan

Cervical Spine

44. Which view is best for visualizing the lower cervical vertebrae?
   a. sunrise
   b. swimmers
   c. Y
   d. Odontoid

45. The clinician suspects cervical spinal nerve root involvement. Which plain film radiographic view will be most useful?
   a. A-P
   b. Lateral
   c. Oblique
   d. Axial

Thoracic Spine
46. What is the most likely etiology for this problem?
   a. osteoporosis
   b. acute trauma
   c. metastasis
   d. tuberculosis

Lumbar Spine

47. Name the view.
   a. A-P
   b. Lateral
   c. Oblique
   d. Axial

Brain

48. White collections inside the skull on CT images of acute head trauma suggest . . .
   a. fracture
   b. bleeding
   c. tumor
   d. ischemia
49. Which is best for differentiating hemorrhage from ischemia during the first few hours after onset of suspected cerebro-vascular accident?
   a. MRI
   b. CT
   c. Radionuclide scintigraphy
   d. Ultrasound

50. Which imaging technology was used to generate this image?
   a. plain film radiography
   b. CT
   c. Ultrasound
   d. MRI

51. What is the diagnosis?
   a. hemorrhage
   b. ischemia
   c. metastasis
   d. fracture

Chest

52. An overexposed chest film makes it difficult to see the . . .
   a. pulmonary vasculature
   b. spinal anatomy
   c. retrocardiac structures
   d. mediastinal structures
53. To ensure adequate exposure of a plain film radiograph of the chest, which of the following subjects will likely require more x-ray energy than the others?

   a. adult male
   b. adult female
   c. male child
   d. female child

54. Which chest projection allows greater inflation of the lungs?

   a. Upright P-A
   b. Supine A-P

Cardiac

55. The normal cardiac silhouette should be no greater than approximately what percent of the thoracic width?

   a. 25%
   b. 50%
   c. 75%
   d. 100%

56. Is this myocardial perfusion . . .

   a. normal?
   b. abnormal?

Abdomen

57. How was the subject positioned for this abdominal study?

   a. supine
   b. upright
   c. lying on left side
   d. lying on right side
58. What is the diagnosis?
   a. perforation
   b. diverticular disease
   c. multiple polyps
   d. normal

59. While reviewing an A-P supine abdomen radiograph, you note that the inferior margin of the liver is at the level of the 12th rib. This finding suggests . . .
   a. hepatomegaly
   b. normal

Radiologist’s Report

60. The radiologist’s report should contain which of the following items?
   a. identification information for patient and referring physician
   b. description of imaging procedure
   c. findings
   d. conclusion
   e. all of the above