**RTC 203 Student Learning Outcomes (SLO) Assessment**

**SLOAT Spring 2011 Final Report**

***prepared by M. Carpenter***

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**Introduction**

In RTC 203, second-year radiography students learn about the specialized and highly technical procedures in radiography, such as Computerized Axial Tomography (CAT), Magnetic Resonance Imaging (MRI), and Angiography, and the general indications for each examination. Students are introduced to Radiation Oncology, Nuclear Medicine, and Bone Densitometry. Quality control methods are also covered. Selected radiographs supplement anatomical review of the systems to be examined, prior to radiographic procedures. Lecture is supplemented with demonstrations and opportunities for students to practice the skills in the radiographic room. Critiques of radiographic films are conducted in the classroom/laboratory. The RTC 203 course outline lists the course goals as follows:

 1. describe the parts of a computer utilized in radiographic imaging;

2. identify and/or explain the basic concepts behind Computed Tomography (CT) imaging;

3. recognize and describe interventional studies performed in the radiology department;

4. explain the basic operation and safety aspects of Magnetic Resonance Imaging (MRI);

5. describe the three types of digital imaging;

6. perform quality control tests required for imaging departments;

 7. recognize and differentiate between the regulating agencies, departments, and committees, with

 which medical imaging departments and staff must be in compliance; and

8. describe the basic concepts of radiation oncology, nuclear medicine, and bone densitometry.

**SLOAT Assessment Plan**

The SLOAT Spring 2011 RTC 203 Student Learning Outcomes (SLO) assessment, which was conducted by Mary Ellen Carpenter, focused on course goals 3 and 4. Data was collected for all 18-second year radiography students. Measureable performance objectives (MPOs) related to course goal 3 were assessed by analyzing student performance on blueprinted questions on test 3, the midterm exam, and the final exam. Similarly, MPOs related to course goal 4 were assessed by analyzing student performance on blueprinted questions on test 4 and the midterm exam. Students were provided with class syllabi, which list course objectives, in addition to all associated reading assignments. Class PowerPoint slides and applicable journal articles were posted on eLearning for student use.

**Assessment Results / Findings**

**Course Goal 3** – Evaluation includes comparison of student results from test 3, the midterm exam, and the final exam.

**Course Goal 4** – Evaluation includes comparison of student results from test 4 and the midterm exam.

**Blueprinted Test / Exam (Student Performance) Results**

Course Goal 3**:** Recognize and describe interventional studies performed in the radiology department.

Test 3 class average in support of goal 3: 81%

Midterm Exam class average in support of goals 3 and 4: 88%

Final Exam class average in support of goal 3: 95%

**Blueprinted Test / Exam (Student Performance) Results –**

Course Goal 4:Explain the basic operation and safety aspects of Magnetic Resonance Imaging (MRI).

Test 4 class average in support of goal 4: 91%

Midterm Exam class average in support of goals: 88%

**Summary**

**COURSE GOAL 3**: Recognize and describe interventional studies performed in the radiology department.

Students showed improvement in overall content knowledge of this goal based on increasing test scores.

The grades for test 3, the midterm, and then the final exam increased in class overall average from 81%, to 88%, to 95%. In review of the test questions, areas of student learning weakness were identified.

* Test questions 4 and 7 evaluated student knowledge on correct imaging option for a specific body part. This information was presented to the student while they learned about arthrography. Unfortunately, the students consistently performed poorly on this assessment. Arthrography procedures are seldom performed any more, as MRI has replaced them as a non-invasive alternative. This means there is no clinical reinforcment for this learning, so didactic instruction must include better delivery of the material.
* Test question 29 included material from a student laboratory activity. Student performance was poor, though if students had studied the material from the lab as part of their test preparation, the success rate on this question should have been higher. Students will be reminded that lab activities include important information.
* Test question 23 pertained to patient informed consent. Students did well on the test and the final but poorly on the midterm question. Upon review, the wording was different on the midterm and it appears to have caused student confusion. In the future, wording of this test question will be re-evaluated.
* Test question 24 referred to information mentioned in RTC 203, but should have been learned initially in RTC 103 – Patient Care. Students performed poorly on the test question but showed evidence of learning on the same question when presented on the final exam.
* Test question 1 was based on a measurement used for catheters in medicine. Students showed improvement from the test question to the final exam question.
* Finally, question 33 on the final exam presented reason for concern. While 12 students answered it correctly, 2 students answered it incorectly and 4 students chose to skip it. The content of the question is most concerning. Students are taught the properties and uses of various radiographic contrast medias in RTC 107 – Pharmacology and Contrast Media. Based on the results of this final exam question, one third of the second-year radiography students did not know that barium sulfide is NEVER injected into a joint space. Review of RTC 107 content will be performed.

Actions based on these findings will include the following:

In RTC 203,

* Future emphasis will be placed on arthrography indications and procedure. Currently students perform 1 lab activity covering arthrography. This will be increased in the future. (See Test questions 4 and 7.)
* Radiograph identification will continue, and students will be reminded to review this material for exam preparation. (See Test question 29.)
* The wording of test questions pertaining to patient informed consent will be reviewed. (See Test question 23.)

Also, the course content of RTC 103 will be reviewed pertaining to vaso vagal responses and student learning. And the course content for RTC 107 will be reviewed for appropriate contrast media administration and student learning.

**COURSE GOAL 4**: Explain the basic operation and safety aspects of Magnetic Resonance Imaging (MRI).

Students performed well in this area of RTC 203 Special Procedures. An overall class test average of 91% included class high scores of 100% (2 students) and class lows of 80% (3 students).

* Question 28 identified confusion in terminology; specifically, students seemed to be not fully aware of the terms gauss lines and fringe fields being mutually inclusive.
* Question 12 identified confusion in material content. A video viewed in class contradicted information provided in lecture. However, it should be noted that the discrepancy was pointed out in class and the correct information was identified. Unfortunately, more than half of the students failed to recognize the correct information. An alternative video may be considered for future instruction.
* Question 8 was structured with a correct answer and then a more correct answer. Students tended to select the correct answer and then move on to the next question before reading all of the possilbe responses. The construction of this question was very intentional in an effort to prepare students for success on the national boards. It has been the philosophy of this program that if the student does not read and comprehend the question, they cannot answer it correctly. One third of the class answered this question incorrectly. It is believed that they selected the first correct response instead of weighing all the options and identifying the more correct answer to follow.

Actions based on these findings will include the following:

In RTC 203,

* Emphasis will be placed on gauss lines and fringe fields. (See Test question 28.)
* New DVD on MRI safety or more specific emphasis on fetal safety during MRI must be found and used. (See Test question 12.)

Also, students in the Radiography program must continue to be reminded of the importance of reading all of the test answer options prior to making a selection and moving on to the next question. (See Test question12.)