**RTC 106 Student Learning Outcomes (SLO) Assessment**

**SLOAT Spring 2011 Final Report**

**submitted by John Marfo**

**Introduction**

This course is a continuation of radiographic positioning principles with an emphasis on the bony thorax, vertebral column, and contrast media procedures (e.g., IVP, esophagus, UGI, small bowel, barium enema, etc.) supplemented with practical instruction and application to include pediatrics and geriatrics. It is important that radiology students master definite techniques and procedures with young and elderly patients. Students will master given techniques, which will help them, as technologists, save time and energy as well as minimize the amount of radiation exposure to the patients. Film critique seminars are also routinely conducted in classroom and lab sessions.

The goals of the course listed on the course outline are as follows:

RTC 106 Course Goals:Upon completion of this course the student radiographer will be able to:

1. satisfactorily perform under laboratory conditions radiography procedures of the vertebral column, pelvic girdles, and the bony thorax for both pediatric and geriatric patients;

2. demonstrate and describe radiographic positioning and procedure of the vertebral column, pelvic girdles, and the bony thorax; and

3. identify and utilize appropriate contrast media and lab equipment for specific radiographic procedures.

**SLOAT Assessment Plan**

The SLOAT Spring 2011 RTC 106 Student Learning Outcomes (SLO) assessment study was focused on course goal 3, which involves the identification and utilization of appropriate contrast media and lab equipment for specific radiographic procedures. Specific learning objectives (MPOs) related to course goal 3 include the following:

3.1 identify appropriate contrast media for radiographic procedures (i.e., intravenous Urography (IVU), Voiding Cystography (VCUG)/Cystogram, the esophagram, the upper gastrointestinal series (UGI), the small bowel series and the barium enema)

3.2 utilize appropriate contrast media to perform radiographic procedures (i.e., intravenous Urography (IVU), Voiding Cystography (VCUG)/Cystogram, the esophagram, the upper gastrointestinal series (UGI), the small bowel series and the barium enema)

3.3 demonstrate and perform all operation room (OR) procedures using the C-Arm

Students collected data related to side effects of the various contrast media used in specific radiographic procedures from six hospitals (i.e., Beth Israel Medical Center in Newark, Jersey City Medical/Trauma Center in Jersey City, St. Michael’s Medical Center in Newark, Clara Mass Medical Center in Belleville, UMDNJ Main and UMDNJ ‘DOC ‘ in Newark) – see RTC 106 – Appendix A for patient survey form to report side effects and findings summary.

Students working under laboratory conditions were given instructions on the administration of contrast media, proper patient positioning, Central Ray (CR) placement, image evaluation, and shielding. Data was collected on the performance of all students (see RTC 106 – Appendix B.) It is important to note that the concepts of contrast media administration for specific radiographic procedures, side effects of the various contrast media, patient positioning, CR placement, image evaluation, and shielding were introduced and discussed extensively in class lecture during weeks 6 to 13 of the semester.

**Assessment Results**

Patient data was collected by the students to determine possible side effects of administration of various contrast media. These results were tabulated and are included in this report in RTC 106 – Appendix A.

Students were assessed on how well they performed radiographic procedures, which ultimately measured their level of achievement of all related course learning objectives (i.e., MPOs 3.1 – 3.3), by using a checklist rubric (see RTC 106 – Appendix B) to determine their mastery of the following clinical skills:

* patient preparation for a specific procedure
* patient positioning
* shielding
* contrast preparation and administration
* patient history/precaution surveying to determine possible side effects of contrast media administration

The performance of each student, based on his/her ability to properly complete each item bulleted above, was rated as follows: Pass, Committed a Minor Error, or Fail. These cumulative student performance rating assignments are tabulated in Appendix B. To summarize, notable findings include the following:

* 96% of the students were successful at correctly preparing the patient for a specific procedure; only 1 student committed a minor error while performing this task. (MPO 3.2)
* 100% of the students demonstrated correct patient positioning. (MPO 3.2)
* 92% of the students successfully demonstrated shielding during the procedure. (MPO 3.2)
* 88% of the students successfully identified and prepared the contrast media for the specific procedure. (MPOs 3.1, 3.2 & 3.3) Note: The greatest challenge for students seemed to be differentiating between single contrast preparation and double contrast preparation.
* 100% of the students identified and correctly noted patient history in order to minimize side effects of the contrast media administration. (MPOs 3.1 & 3.2)

**Summary**

Students were assessed by a checklist rubric while performing an activity to demonstrate mastery of skills required to be learned in RTC 106. Every student performed as the radiographic technologist while classmates took turns portraying patients. Students were very familiar with patient positioning since they should have already attained this skill in RTC 101, which is a prerequisite of RTC 106. In addition, students were very mindful of the side effects of radiation during procedures because of a project they completed in this course. Lastly, students who were not actively performing during the skill assessment period initiated discussions and engaged in rich dialog with classmates about methods of and options for patient positioning, shielding, and patient preparation.

Although the students in this cohort performed very well, recommendations for student learning and teaching improvement include the following:

* Perform more demonstrations for students to observe and more opportunities for them to practice positioning, shielding and patient preparation.
* Encourage students to find out about or ask patients about known allergies before administering contrast media.
* Encourage students to identify the location of and procedures of use of Crash Carts at all of their hospitals and to familiarize themselves with relevant medications.

Appendix A – Patient Survey Concerning Side Effects of Radiographic Procedures &

Summary of Findings

1. Patient Sex – Circle one: Male Female

2. Patient Age: \_\_\_\_\_

3. What is the reason the doctor ordered the test? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Type of contrast media procedure(s) – Circle ALL that apply.

IVP Esophagram

UGI Series Small Bowel Series

Barium Enema Cystogram

Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Has the patient had previous contrast studies? – Circle one:

Yes No

6. Has the patient had any adverse reactions to a previous X-Ray or CT –Scan Contrast Media *Injection* (*Intravenous*)? – Circle one:

Yes No

7. Has the patient had any adverse reactions to a previous X-Ray or CT –Scan *Oral* Contrast Media?

Yes No

8. Has the patient had any adverse reactions to *any* previous radiographic contrast media?

Yes No

9. Has the patient had any adverse reactions to iodine?

Yes No

9. Has the patient had any severe adverse reactions to seafood?

Yes No

10. Is the patient diabetic or on blood sugar medication?

Yes No

Notable results of data collected using the above Patient Survey is bulleted and is also summarized in the table that follows.

* 25 students participated and returned a total of 25 completed surveys.
* None of the patients surveyed reported any previous adverse reactions to intravenous or oral contrast media.
* 16% of the female patients surveyed reported having severe adverse reactions to seafood but no severe reactions to contrast media.
* 10% of the male and 5% of the female patients surveyed are diabetic or on blood sugar medication but none reported having previous severe reaction to contrast media.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Reported Patient Reaction | Males | Females | Pediatric Males | Pediatric Females |
| Adverse Reaction to Oral Contrast Media | 0% | 0% | 0% | 0% |
| Adverse Reaction to Contrast Media Injection (Intravenous) | 0% | 0% | 0% | 0% |
| Severe Adverse Reaction to Seafood | 0% | 16% | 0% | 0% |
| Diabetic or on Blood Sugar Medication | 10% | 5% | 0% | 0% |

Recommendation: Survey a larger population of patients for the next study.

Appendix B – Contrast Study Procedures Student Performance Checklist Rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Procedure(s) | | | Student Performance Rating | | |
| Pass | Minor Error | Fail |
| 1 | Esophagram | AP/PA/RAO/LAO/LEFT LAT |  |  |  |
| 2 | UGI Series | AP SCOUT, RAO, LAT, PA, LPO, AP (complete in order) |  |  |  |
| 3 | Small Bowel Series | AP SCOUT PA/Compression  PA Follow through |  |  |  |
| 4 | Barium Enema – Single | AP SCOUT, AP LPO/RPO, AP AXIAL, LEFT LAT RECTUM, AP POST EVAC |  |  |  |
| 5 | Barium Enema – Double | AP SCOUT, LT/RT LAT DECUB, VENTRAL DECUB RECTUM |  |  |  |
| 6 | Intravenous Urography (IVU) | AP SCOUT, 30 DEGREES RPO/LPO, PA POST VOID |  |  |  |
| 7 | Voiding Cystogram (VCUG) | AP BLADDER 10 – 15 DEGREES CADDAD (FEMALE), AP VOIDING 30 DEGREES RPO (MALE) |  |  |  |

Results of Student Performance in the Contrast Study

|  |  |  |  |
| --- | --- | --- | --- |
|  | Pass | Minor Error | Fail |
| Student prepared the patient for a specific procedure. | 24 | 1 | 0 |
| Student correctly positioned the patient for a specific procedure. | 25 | 0 | 0 |
| Student successfully demonstrated shielding during the procedure. | 23 | 2 | 0 |
| Student identified and prepared contrast media for a specific procedure. | 22 | 3 | 0 |
| Student surveyed the patient and noted any previous adverse side effects. | 25 | 0 | 0 |