**Video Lesson Plan Erica Cole**

**Lesson Plan Title-** How to recognize a Compton Scatter interaction

**Objectives-** After completing this lesson, students will be able to recognize a Compton Scatter interaction and its effect on scatter on an x-ray film. Students can take this recognition and apply it at their clinical site to recognize how scatter effects film quality.

**Discipline and Topic-** This lesson will be part of a topic discussing the types of x-ray interactions that take place within the body.

**Target Population-** This lesson will be presented to college level radiography students studying radiographic exposure physics.

**Curriculum Links-** This lesson will satisfy the examination requirements set forth by the American Registry of Radiologic Technologist. The link where this content can be found is: [https://www.arrt.org/pdfs/Disciplines/Content-Specification/RAD-Content Specification.pdf](https://www.arrt.org/pdfs/Disciplines/Content-Specification/RAD-Content%20Specification.pdf%20)

**Media Literacy Objectives-** The use of this audio media will fulfill standard 2b of the NETS.S set forth for teachers by the ISTE

**Materials Description and Timing-** Using the following link [http://www.youtube.com/watch?v=4p47RBPiOCo](http://www.youtube.com/watch?v=4p47RBPiOCo%20). Students will watch the video that illustrates what happens at the atomic level during a Compton Interaction within the tissue being irradiated. Before using the video I will discuss Compton Interactions in detail so they will know what exactly happens during this type of interaction within the body. I will then let them see the video clip, repeating it several times so they all are able to fully recognize what it looks like. I will then discuss why we need to know this and how it has a direct effect (along with other types of x-ray interactions) on the quality of the x-ray image produced.

**Scope and Sequence-** . I will begin the video lesson with a discussion on Compton Interactions within the body, specifically what they are and when they take place. I will then let them see the video clip, repeating it several times so they all are able to fully recognize what it looks like. I will then discuss why we need to know what a Compton Interaction looks like. This will lead into the next lesson on what effect Compton (as well as other x-ray interactions within the body) have on the quality of the x-ray image produced.

**Supplemental Materials-** The only materials used for this lesson are Power Point and a presentation remote with a laser pointer. The Youtube video clip is embedded in the Power Point presentation. The homework and quiz will be handouts.

The students will be given the following homework assignment:

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Describe Compton Scattering/Effect.

2. What are the probabilities that a Compton Interaction will take place with changing kVp?

3. What does a Compton Interaction contribute to the x-ray image?

4. What effect does the atomic number of irradiated tissue have on the probability of a Compton Interaction taking place?

Quiz:

1. As you increase kVp, what effect will this have on the probability of a Compton interaction taking place?

 a. no effect

 b. it will increase

 c. it will decrease

2. True or False. Compton interactions are the number one source of radiation exposure to the radiographer.

3. As you increase the Z# of the irradiated tissue, this will \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the chance a Compton interaction will take place.

 a. it will increase

 b. it will decrease

 c. have no effect

4. True or False. A Compton interaction result in ionization of the irradiated tissue.

5. Increasing kVp will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the amount of scatter reaching the film.

 a. increase

 b. decrease

 c. have no effect on

**Evaluation of Students-**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Excellent (90-100%) A | Average (80-90%) B | Poor (70-80%) C | Fail (70% or below) F |
| Performance on quiz | * Obtains grade in above range
 | * Obtains grade in above range
 | * Obtains grade in above range
 | * Obtains grade in above range
 |
| Homework  | * Provides detailed answers to questions
* Gets more than 4 questions correct
 | * Provides some detail for given answers
* Gets 3-4 questions correct
 | * Provides little detail for given answers
* Gets 1-3 questions correct
 | * Provides no detail , “short answers” only
* Gets only 1 or less answers correct
 |
| Performance recognizing presence of interaction during clinical rotation | * Consistently recognizes scatter effect on film
* Applies information taught accurately most of the time
 | * Sometimes recognizes scatter effect on film
* Applies information taught accurately some of the time
 | * Rarely recognizes scatter effect on film
* Rarely applies information taught accurately
 | * Never recognizes scatter effect on film
* Never applies information taught accurately
 |

**Evaluation of Lesson-** I have used this lesson in the past and used student feedback and grading of assessments to determine the effectiveness of this lesson. Students felt that the interaction of the media in the Power Point slides and not the simple mundane standard slide features engaged them in the lesson and helped them to gain a firm understanding of the material. Simply explaining something that takes place at the atomic level is difficult for some students to visualize. The use of a video clip shows them precisely what is happening without the use of their imagination. It displays the interaction on a scale that they can see. I plan on using this in the future, given the results from the student assessments remain consistent showing effectiveness.

**Rational for using the medium-** I chose to use this form of video media because it promotes “critical thinking” and “higher level skills” due to the selection of the material in a judicious and wary manner (Hilliker, 2012). Students, through this short video that serves a specific purpose within my lesson, are able to grasp a concept using their critical thinking skills, relating this moving diagram with actual processes that take place within the body. This information can then be applied at their clinical site through the recognition of how this ( and other forms of x-ray interactions) alter the quality of the x-ray image they produce.

References:

Hilliker, S. (2012) Learning With Video. Retrieved on November 12, 2012 from <https://blackboard.albany.edu/webapps/portal/frameset.jsp?tab_group=courses&url=%2Fwebapps%2Fblackboard%2Fexecute%2Fcontent%2Ffile%3Fcmd%3Dview%26content_id%3D_714978_1%26course_id%3D_27188_1%26framesetWrapped%3Dtrue>

ISTE.S standards retrieved on November 12, 2012 from <http://www.iste.org/docs/pdfs/nets-s-standards.pdf>