Math Strand 1: Number and Operations

CLE: 1.1 Understand numbers, ways of representing numbers, relationships among numbers and number systems, represent and use rational numbers.

Health Profession: X-ray Technologist

Name: Christi McGregor; MWSU Senior Nursing Student

Contributor Kandus Clizer, Radiology Technologist

Objectives:

At the completion of this presentation the high school student will be able to:

1. **Explain why it is important to know why you need to measure each patient to get the kVp.**
2. **Measure the person next to you and find the correct kVp needed.**
3. **Identify the importance of this information to x-ray technology.**

Background Summary of Information as Related to X-ray Technologists and CLE

- **Measure total body thickness from top of belly to the bottom of the back or which ever part is going to have the x-ray taken.**
- **kVp is the total amount of voltage that goes through a person's body**
- **If there is too much kVp the x-ray image will be too dark, if there is not enough kVp the x-ray will be too light. The right amount of kVp needs to be used so the image that will be x-rayed can be seen clearly.**
- **kvP is influenced by collimation (size of the image) and SID (source to image distance).**
- **20 cm = 110 kVp is the standard (baseline)**
- **Add 5 kVp for every 10 cm**

Scenario:

Joey was playing on the monkey bars at school, fell off and landed on his chest. When his mother and father arrived with him at the hospital, the doctors had ordered a chest x- ray. Joey's body thickness from the top of his chest to the bottom of his back is 30 cm. What is the total kVp (amount of voltage) you would use on the Joey?

On a patient measuring 20 cm we would use 110 kvp. 30-20=10. For every 10 cm add 5 kVp to the standard kVp 110. 110+5=115. Therefore, you would use 115 kVp for Joey who measures 30 cm.

Activity

Split up into groups of three. One person will be the patient which will be measured (chest, arm, leg, etc.) in cm from the top to the bottom of the area being measured. Two people will be performing the x-ray so they need to figure out the thickness of the patient, use the standard equation above 20 cm = 110 kVp, and figure how much voltage they need to go through the patient to make a clear image.