Fluoroscopy

Health & Medicine

1. How conventional fluoroscopy (with an image intensifier) produces the series of images that make a video. A series of images are captured at very high speeds. These images are thun at the same speed as they are captured so that they appear to be a video. Since the speed of the images is so fast, the eyes are unable to differentiate between the individual pictures and perceives it to be one moving picture. Before the procedure is started the shutter speed of the cameras is synchronized with the frequency of pulses so that there is no destructive overlap between the two.

2. What happens to the beam from when it exits the tube until the image is formed and viewed, the two ways that the image is magnified. ?

The size of the image depends upon the position of the focal point which can be altered by varying the voltage supplied to the electrostatic lenses.. A greater voltage causes a greater acceleration causing the focal point to move closer and hence producing a magnified image. Since the magnification involves movement of the focal point, a particular part of the body is focused and magnified. Another way to achieve a greater magnification is by varying the distance between the patient’s body and the focal point. The closer the focal point the bigger is the size of the image.

3. What happens to the beam from when it exits the tube until the image is formed and viewed, the two ways that the image is magnified.

During the magnification, the distance between the focal point and the patient’s body is reduced, meaning that more beams get focused onto a particular spot, hence increasing the radiation exposure for the patient. High exposure to radiation is harmful and this is the reason why magnification mode is only used when it is absolutely necessary to observe intricate details.

4. How brightness is controlled using the ABC (Automatic Brightness Control)?

Automatic Brightness Control(ABC) as the name suggests is an automatic system which adjusts various factors in order to maintain the desired brightness. The ABC system keeps in check the flow of current between the two terminals and also monitors the intensity of the output screen. As soon as the current or intensity falters, the ABC alters the current, voltage or the pulse rate to maintain the brightness. All of these methods are used simultaneously in cordination with one another, eg. The voltage maybe lowered while the current increased at the same time to maintain the desired brightness and contrast.

5. This should also include all the parts of the fluoroscopic unit necessary in producing the images.

The main components of the fluoroscopic unit include the two end terminals called the cathode and the anode, the electrostatic lens, the output fluorescent screen and the glass envelope. The voltage between anode and the cathode is used to accelerate the electron stream. The glass envelope serves as an insulation to the whole unit. Within the glass envelope are a number of charged electrodes referred to as the electrostatic lenses. The purpose of these lenses is to focus the image-carrying electron stream. The output fluorescent screen shows the output image as received by the reflected streams from the patient’s body.

Through the above insight into thje fluoroscopic technique, it can be said it is a really remarkable non-invasive technique which allows the images of internal structures to be constructed. These images can be altered to the desired magnification, brightness and contrast as desired by the doctor and

therefore it is a very useful medical technique. However like everything, it has its draw backs the most important of which is that the exposure time should be kept to its minimum or the patient may undergo harmful mutation.