

## **CHAPTER 2**

### **COMPONENTS OF CT SCANNER**

Before we move forward, I wanted to discuss some Information about the components of the CT scanner. Although this is a book on the physics of CT, CT Technologists should understand the equipment they are operating on a daily basis. Every CT component will not be discussed; however, the main components will be address in small detail. These components will be explained in layman's terms.

#### **Gantry**

The gantry is the donut hole that surrounds the patient in the vertical plane. The gantry houses the slip rings, x – ray tube, collimators, detectors, detector electronics, and the high – tension generator. The generator, in the gantry, is a high frequency generator and operators at 5 to 50KHZ. The generator also has different power ratings, ranging from 30 to 60 kilowatts. These power ratings enable a wide range of exposure techniques for KV and mA. The two main features, of the gantry, when scanning a patient are the gantry aperture (opening) and gantry tilting range. Most CT scanners have a 70cm aperture, which helps with patient's position and provides access in emergency situations. The gantry tilting range on most CT machines varies depending on the scanner. The gantry has to be tilted in order to perform all patients and clinical exams.

## **Patient Couch**

The patient couch is the table the patient lies on while performing the CT examination. The couch has to be strong and rigid in order to support the patient's weight. It also has to be design so it can be easily cleaned. The patient couch moves in the vertical and horizontal directions. The vertical movement allows the couch to be adjusted to a range of height. This movement makes it easier to get the patient off and on the table. The horizontal movement allows the patient to be scanned from head to thighs without the need for repositioning.

## **Processing System**

Most CT machines are capable of multiprocessing. Multiprocessing allows the unit to carry out one or more process at a time. There are three types of processing normally used in CT: Pipeline, Parallel, and Distributed.

Pipeline processing allows for rapid image reconstruction; therefore, after scanning the patient, the image can be viewed on the monitor.

Parallel processing allows for reformation, magnification, window / level control and image analysis techniques.

Distributed processing allows the array processors to perform bulk reconstruction tasks at high speeds. Pipeline, Parallel, and distributed processing enables the CT scanner to run rapidly and efficient.

## **Image Storage**

CT is a digital imaging modality; therefore, data is stored in digital form. Storage devices for CT includes: magnetic tape, magnetic disks, digital video type, optical disk, optical tape, and laser recording system. The CT Technologist should always archive patient's exams to protect them from getting lost or damage.