

# Medical Technology Equipment

## Modality Definitions/Glossary

### Modality Definitions

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#### **PET Scanner**

PET stands for Positron Emission Tomography and is a method of body scanning that detects radioactive compounds that have been injected into the body to provide information on function rather than structure, and to help differentiate normal tissue from cancer. PET scanners are relatively new to the secondary-equipment market.

#### **MRI Scanner**

Magnetic Resonance Imaging is an imaging technique used primarily in medical settings to produce high-quality images of the inside of the human body. MRI produces images that are the visual equivalent of a slice of anatomy, and it is also capable of producing those images in an infinite number of projections through the body. To produce its images, MRI uses radio frequencies, a computer and a large magnet that surrounds the patient.

#### **CT Scanner**

Computerized Axial Tomography scanners use a fan beam of X-rays and a detector system that rotates around the patient's body to create thin cross-sectional images (slices) of the head, neck, chest, abdomen and extremities that are then displayed on a computer or transferred to film.

#### **Nuclear Medicine**

In nuclear medicine diagnosing techniques, very small amounts of radioactive materials are introduced into the body. Because they are taken up by specific organs, bones or tissues, the emissions they produce can provide crucial information about a particular type of cancer or disease. Information from nuclear medicine studies describes organ function, not just structure, so that many diseases, including cancers, can be detected early. PET scanners and gamma cameras are two pieces of nuclear medicine equipment.

#### **X-ray Equipment**

This encompasses a host of equipment including Angio and Cath Labs, Fluoroscopy suites, General Radiography, Mammography and Surgical C-arms. Conventional X-ray imaging has evolved over the past 100 years, but the basic principle is still the same as in 1895. An X-ray source is turned on, and X-rays are radiated through the body part of interest and onto a film cassette positioned under or behind the body part.

#### **Ultrasound**

This medical imaging technique uses high-frequency sound waves and their echoes. The technique is similar to the echolocation used by bats, whales and dolphins. These portable machines display the distances and intensities of the echoes on the screen, forming a two-dimensional image. The main advantage is that certain images can be observed without using radiation. This lends itself well to obstetrics and gynecology, but ultrasound is also used in cardiology and urology.

#### **PACS/Picture Archiving and Communication Technologies**

These IT-based products improve the speed and consistency of image communication within the radiology department and throughout an enterprise. When integrated with RIS, it creates a single powerful work flow engine that allows radiologists to access comprehensive patient information at a single workstation via a single login anywhere in the enterprise. These systems operate in conjunction with MRI, CT, Digital X-ray, PET and Nuclear Medicine systems and eliminate the need to process hard-copy films (in turn, eliminating the need for toxic chemicals and storage of image history).

## Glossary

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**Angiography:** Imaging of a system of blood vessels after injection of a dye opaque to X-rays.

**Bone Densitometer:** A device that measures the strength and density of bones; often used to determine the risk of developing osteoporosis.

**Broker:** Buyer or seller of equipment that does not provide value-add proposition to transaction.

**Cardiology:** The clinical study, treatment and imaging of the heart.

**C-arm:** A mobile fluoroscopy system used for studies ranging from orthopedics to cardiology.

**CT:** Computerized Axial Tomography—modality using fan beam of X-rays, which rotates around the body to produce “slices” of human anatomy.

**Dealer:** Buyer or seller of equipment that provides value-add proposition to transaction (i.e., logistics, service, warranty).

**Diagnostic Imaging Equipment:** Family of devices used for the visualization and study of the human body.

**Defibrillator:** An electronic device used to re-establish normal heartbeat.

**EKG:** Electrocardiogram—a test that records the electrical activity of the heart, shows abnormal rhythms (arrhythmias or dysrhythmias) and detects heart muscle damage.

**Endoscopy:** Visual examination of the interior of a hollow body organ by use of an endoscope.

**Fee Per Scan:** Agreement between healthcare provider and equipment provider to share in the profits of imaging.

**Film Processor:** Peripheral equipment used in conjunction with Laser Camera to create hard-copy images.

**Fluoroscopy:** An X-ray procedure that makes it possible to see internal organs in motion.

**FOV:** Field of View—explains the size of an area being imaged.

**Laser Camera:** Peripheral equipment used to create hard-copy image of visualizations generated by various imaging systems.

**Linear Accelerator:** A machine that creates high-energy radioactive materials to treat cancers, using electricity to form a stream of fast-moving subatomic particles. Also called megavoltage (MeV) linear accelerator or a linac.

**Mammography:** A diagnostic procedure to detect breast tumors by the use of X-rays.

**Modality:** Subset of Diagnostic Imaging Equipment (e.g., MRI, CT, Ultrasound, X-ray).

**Modular:** Transportable building constructed to house a piece of equipment.

**MRI:** Magnetic Resonance Imaging—modality using large magnet to generate high-quality visualizations of soft tissue in body.

**Neuroradiology:** Imaging techniques that deal with the visualization and study of the brain, spine and nervous system.

**Nuclear Medicine:** Imaging technique that introduces a small amount of radioactive material into the body.

**OEM:** Original Equipment Manufacturer.

**Open MRI:** Low-field MRI system that offers larger patient aperture to increase patient comfort.

**PACS:** Picture Archiving and Communication System—IT-based storage and retrieval system for digital images.

**PET:** Positron Emission Tomography—modality that detects radioactive compounds that have been injected into the body to provide information on function rather than structure.

**Point of Care:** Laboratory and other services provided to patients at the bedside.

**Portable:** Point-of-care imaging device using X-rays or Ultrasound—primarily used in the Emergency Room and at the bedside.

**Probe:** Attachment used in conjunction with an Ultrasound to direct the sound waves to produce images of specific body parts.

**Pulse Oximeter:** Computerized monitor and probe that displays a digital percentage readout of a calculated estimate of the patient's hemoglobin (Hgb) that is saturated with oxygen (SpO<sub>2</sub>).

**Radiology:** Medical imaging techniques that produce a photographic image on a radiosensitive surface by radiation other than visible light.

**RSNA:** Radiological Society of North America—organization that holds the largest domestic trade show in the industry.

**Ultrasound:** Medical imaging technique that uses high-frequency sound waves and their echoes.

**Urology:** Branch of medicine that deals with the diagnosis and treatment of disorders of the urinary tract or urogenital system.