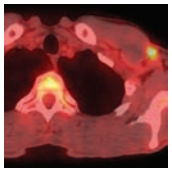
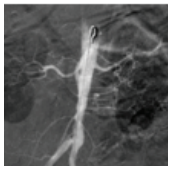
Nuclear Medicine



As pictured on the front of the brochure, a gamma camera records information produced by a radiopharmaceutical "tracer" containing small amounts of a radioactive substance. The tracer, injected, swallowed or inhaled just prior to the scan, concentrates in specific tissues. Areas with high activity—such as a growing tumor—attract more of the tracer and are visible as "hot spots" in resulting images. PET and SPECT, the most common forms of nuclear medicine, are commonly used to assess the function of internal organs (thyroid, brain, lungs, liver, gallbladder, etc.) and for bone scanning and cardiac stress tests.

Interventional Radiology

Interventional radiology (IR or VIR)



May use several modalities for imaging. Fluoroscopy, CT or ultrasound may be used for real-time device placement guidance and verification. The goal is diagnosis or treatment of problems using the least invasive technique.

Common IR procedures include biopsies, catheter insertions, dilation or stenting of narrowed ducts of blood vessels, tube placement for fluid drainage, and line placement for intravenous access.

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The Varieties and Uses of

Medical Imaging

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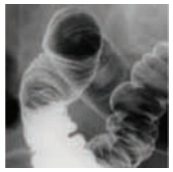
Modalities Based On X-Rays

X-rays, like visible light or radio waves, are a naturally-occurring form of electromagnetic radiation. X-rays pass through most objects, but differences in density change how they are absorbed. Medical x-ray machines produce small bursts of radiation that pass through selected body regions, recording images on film, digital plates, or fluoroscopic screens. Because x-rays are a type of ionizing radiation—and can be harmful in high doses—exposure levels are carefully controlled and monitored. Radiation safety is a primary objective for device manufacturers, physicians and radiologic technologists.

Diagnostic X-rays

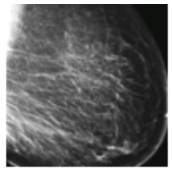
The traditional x-ray exam has been in use for over a century, and still makes up about half of all imaging studies. With its simplicity, low radiation dose, and ease of use, traditional x-ray is often the first kind of imaging ordered—such as chest x-rays, bones and joint dislocations. DXA imaging is a specialized exam for assessing bone loss and diagnosing osteoporosis.

Fluoroscopy



A fluoroscope consists of an x-ray source and a fluorescent screen between which a patient is placed, permitting real-time moving images of internal structures. Most fluoroscopy exams require some kind of contrast agent, administered orally, as in a barium swallow, or via intravenous injection. Fluoroscopy is used for real-time imaging guidance in a variety of procedures including orthopedic and urological surgery, catheter placements, and a range of vascular and cardiac treatments.

Mammography



Low-dose X-ray is used to obtain high-resolution images (mammograms) of the breast. Compression paddles are used to even out breast thickness and to reduce motion, in order that clear images can be obtained while minimizing radiation dose. Screening mammography can provide early detection of breast cancer and other abnormalities.

Computed Tomography (CT)

Computed tomography (CT) is an advanced imaging technique in which an x-ray source rotates around the patient to produce cross-sectional "slices" which are reconstructed to show detailed images. Typical exams take ten minutes to an hour, and many require oral or intravenous contrast to increase detail.

CT provides detailed images of organs, bones, soft tissue, and blood vessels.

Non-X-Ray Modalities

Magnetic Resonance Imaging (MRI)

Magnetic resonance imaging (MRI) is a non-invasive technique that uses a magnetic field and radiowaves to create images of organs and tissues within the body. There is no risk of exposure to radiation during an MR procedure. The scanner may be a traditional "tube" or a device in which only an arm or leg is placed. Contrast materials are often needed. MRI is painless, but patients must remain perfectly still throughout exam. It is important to share information about any metal objects within the patient's body before the exam is ordered and/or performed.

Ultrasound

Uses high frequency sound waves to create real-time fixed and moving images of internal body structures. The exam is usually painless and takes 30-60 minutes. A sonographer or radiologist moves a special device on the skin over the area of interest, producing real-time video images.

Common uses include imaging pregnant women, evaluations of organs, blood vessels and procedures such as needle biopsies and aspirations.