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WHAT ASNC MEMBERS NEED TO KNOW ABOUT Coding

Instrumentation for Coders

A variety of equipment types are utilized in nuclear cardiology procedures. While not all equipment selections affect the choice of CPT codes, some are considered key elements in identifying the appropriate code. This article provides an overview of the various equipment and key word elements, including words critical for inclusion in reports and documentation.

Non-Imaging

In nuclear cardiology, there are very few non-imaging procedures. Equipment utilized for non-imaging procedures include well counters and gamma probes. Gamma probes or gamma monitors are handheld or small devices designed to detect low levels of gamma radioactivity. This type of equipment does not produce a hard copy image for physician viewing. The typical output reported for these studies are in the form of activity counts or mathematical calculations.

Gamma Camera — Planar

The gamma camera is one of the most essential tools in nuclear medicine and is used for taking pictures of unique radioactive tracers or isotopes (radiopharmaceuticals) administered to patients for diagnostic and therapeutic procedures. Most gamma cameras are capable of obtaining two-dimensional images. Planar imaging refers to two-dimensional image acquisition, sometimes referred to as static imaging.

A small amount of radioactivity is administered by means of a pharmaceutical compound that is labeled with a radioactive isotope or a radionuclide without a compound or drug attached. This labeled or unlabeled radiopharmaceutical, or "tracer", is injected, ingested, or inhaled by the patient. The radiotracer administered will travel to an organ or system in the patient's body, thereby allowing physicians to see the distribution of activity.

The radioactive isotope decays within the patient resulting in the "emission" of gamma rays. These gamma rays strike the gamma camera crystal to produce a flash of light. The gamma camera collects these flashes of light produced by gamma rays that are emitted from within the patient and enable the physician to reconstruct a picture of where the gamma rays originated in the patient. This process helps the physician determine how a particular organ or system is functioning.

Key Words: *Common key words used in the service report for planar imaging include* ***anterior, posterior, left or right anterior oblique (LAO, RAO),*** *and* ***lateral.***

Gamma Camera — SPECT

Single Photon Emission Computed Tomography, or SPECT, imaging measures the distribution of administered radioactivity inside a patient's body. As the name suggests (single photon emission), gamma ray emissions are the source of information. However, SPECT imaging produces three-dimensional, or volumetric, images. It is important to note that while all gamma cameras are capable of producing two-dimensional images, only SPECT gamma cameras are capable of producing three-dimensional images.

SPECT acquires a series of two-dimensional projections and reconstructs them to produce three-dimensional volumetric images. If you think of a traditional X-ray, the equipment emits the radioactivity, which is transmitted through the patient. However X-ray imaging differs from nuclear medicine where the gamma rays are emitted from the patient and thus referred to as an emission image. The terms "emission" and "transmission" are important when considering the new hybrid equipment.

Key Words: *Common key words used in the service report for SPECT of the myocardium are* ***short axis, vertical long axis,*** *and* ***horizontal long axis****. The report often includes discussion of segments (e.g., anterior, anterolateral, lateral, inferolateral, inferoposterior, inferoseptal, septal, anteroseptal, and apical).*

Positron Emission Tomography (PET)

Positron emission tomography (PET) is another non-invasive imaging technique that uses small amounts of high-energy radioactive agents, in this case, positrons (positively charged particles) to visualize body function and metabolism. PET radiopharmaceuticals typically have very short "half-lives", which means that they disappear quickly within minutes or seconds and therefore require specialized equipment for imaging. Most SPECT and gamma cameras are not capable of appropriately imaging PET radiopharmaceuticals. Similarly, non-PET radiopharmaceuticals cannot be imagined on PET equipment.

Two other important distinguishers of PET imaging are: (1) the PET radiopharmaceutical emits two photons at 180 degrees simultaneously and (2) all PET images must be attenuation corrected for image quality. Attenuation correction can be achieved by a variety of methods using external radioactive line sources or computed tomography (CT).

Key Words: *Similar to SPECT, common key words used in the service report for PET of the myocardium are* ***short axis, vertical long axis,*** *and* ***horizontal long axis****. The report often includes discussion of segments (e.g., anterior, anterolateral, lateral, infrolateral, inferoposterior, inferoseptal, septal, anteroseptal, and apical.*

Computed Tomography (CT) & Cardiac CT Angiography (CCTA)

Computed tomography, also known as CT scanning, uses special equipment to obtain multiple X-ray transmission images of any part of the body. Traditional diagnostic techniques, such as X-rays, produce images of the body's anatomy. CT images are much more detailed than those provided by conventional X-rays. The images are primarily anatomic showing structure or morphology. However, CT can display many different types of tissue, including blood vessels.

Scanners today use a technique called "spiral" or "helical" CT to obtain images from many angles or projections. Specialized computer processing much like that used in SPECT allows the creation of cross-sections, or slices, of the area of interest. Most CT scanners sold today are capable of performing all types of CT scanning, including imaging of the small blood vessels in the heart.

Hybrid Imaging

Hybrid imaging, or integrated imaging, combines two different imaging technologies into one piece of equipment.

SPECT/CT

SPECT/CT uses computed tomography (CT) for both **attenuation correction** and **anatomical localization** in combination with the original SPECT scan. As gamma rays travel, prior to detection by the gamma camera, body tissue and bones absorb or change the direction of some of the rays. Many of the scattered photons never reach the camera and contribute to the amount of attenuation that results. However, attenuation is much more important than scatter. The attenuation of some of these gamma rays causes the image to be degraded and destroys the quantitative accuracy in the images.

Each imaging technology, SPECT and CT, can often be operated independently with these hybrid pieces of equipment. Utilizing the basic principles of the technology, both the SPECT images and the CT images are acquired for each of the scans independently with the patient in the same position. Specialized software performs reconstructed data sets, including attenuation correction, to create fused images used for precise anatomical localization within body areas.

An important term used with hybrid imaging is "fusion". Fusion has multiple meanings in SPECT/CT. A physician may review and read the transmission (CT image), the emission (SPECT image), and the "fused SPECT and CT image". However, external software with two separate, non-integrated imaging systems can produce a fused SPECT/CT study. The CT in this situation would not be used for attenuation correction. At present, there are no CPT codes that describe using the software method to fuse SPECT/CT or PET/CT.

PET/CT

The initial models of this new technology use CT for attenuation correction only. However, PET/CT systems are now capable of utilizing the CT portion of the PET/CT for not only attenuation correction, but for anatomic localization, with fusion techniques and diagnostic CT imaging. The principles for imaging and key words are the same for each separate imaging modality, and, the discussion of attenuation correction and fusion for SPECT/CT is the same for PET/CT.

In 2005, CPT introduced three codes that describe PET/CT technology when utilized for both attenuation correction and anatomic localization. These codes are currently described for use with tumor imaging only and may not be used for cardiac PET/CT imaging.

For both SPECT/CT and PET/CT, in the absence of a specific code, use an unlisted code to describe any software-fused images. Medicare does not currently recognize or pay for software-fused or integrated system nuclear cardiology procedures. Other third-party payers may allow coverage and payment. The coding and billing for all hybrid imaging and software fusion procedures is evolving. ASNC will continue to monitor trends in this area and notify members of any changes in guidance and expansion of these procedures.