



IMAGING UPDATE

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Nuclear SPECT-CT

I am pleased to announce that Munson Medical Center has recently acquired and installed a new Siemens Symbia T SPECT-CT system. This is the latest in technology, fusing anatomic and functional



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imaging. I believe that this system will facilitate our ability to provide more specific diagnoses for your patients.

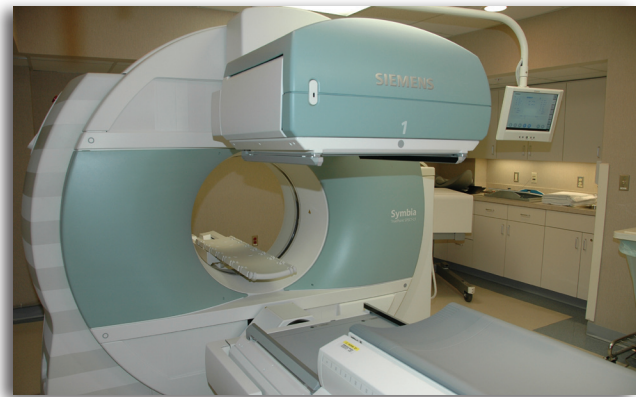
Purpose

SPECT-CT is used primarily for two purposes. The CT portions allows for attenuation correction when utilized for cardiac nuclear imaging. Attenuation correction takes into account patient body habitus so that soft tissue, which may interfere with the image quality/resolution, is "corrected". It is sometimes difficult to interpret myocardial SPECT images due to artifact from anterior wall soft tissues such as the breasts in women or diaphragmatic artifact, which occurs more frequently in male patients. The CT that is performed in conjunction with the myocardial SPECT scan corrects for the overlying soft tissue component and helps to create a greater level of confidence in determining accurately whether a fixed perfusion defect is related to soft tissue artifact or myocardial infarct.

The second and even more powerful purpose of SPECT-CT is the marriage of nuclear function and CT anatomy. This technology will enhance our ability to determine the location of a lesion or process within the body.

Enhanced Studies

The challenge to this point has been to take an area of increased functional activity on a regular nuclear scan and translate it in our minds to what anatomic abdominal, cervical, or mediastinal structure is involved, or what portion of osseous skeleton demonstrates the abnormal accumulation of radiopharmaceutical. By combining these two forms of information, studies have demonstrated that the radiologist will have an increased level of confidence providing not only the appropriate diagnosis, but also the exact anatomic location of the abnormality.



Orthopaedic

SPECT-CT will be extremely helpful in orthopaedic problems such as investigating occult fractures, and distinguishing osteomyelitis from cellulitis or septic arthritis. This form of imaging may be useful in patients with chronic back pain unexplained by clinical or other imaging modalities. It may assist distinguishing spondylolysis in the lumbar region from other adjacent soft tissue or osseous abnormalities. It will certainly help to localize abnormal osseous activity to a specific portion of a vertebra and to an exact vertebral level. The anatomy of the skull base and neck is complex with many structures located in a relatively small area, therefore superimposing the functional images of nuclear medicine with CT anatomy provides a very powerful tool.

Abdomen

SPECT-CT will assist correlating function of an abnormality with anatomic location in patients with intra-abdominal diseases such as pheochromocytomas, carcinoids, or metastatic disease to varying organs or lymph nodes. Hepatic hemangiomas in close proximity to major vascular structures will be more easily evaluated.

Mediastinum, Axillary Regions and Neck

SPECT-CT has similar utility in the mediastinum, axillary regions, and neck, as in the abdomen. There are reports that this new form of imaging provides more accurate localization for sentinel lymph node imaging studies in patients with breast cancer and melanoma. It has particular sensitivity in the neck localizing abnormal function within closely approximated structures such as lymph nodes, salivary glands, thyroid, parathyroids, larynx, and other cervical compartments.

How to Request a Study

The Radiology Department will provide request forms similar to what is currently available. The form will allow a request for a particular nuclear study with SPECT-CT as needed, and the physician will be asked to indicate the location of interest. (e.g. right/left axilla, parathyroid, mediastinum, right/left foot, lumbar spine, mid thoracic spine, etc.) An appropriate set of symptoms, and/or abnormal labs will be useful as always. The nuclear medicine physician of the day will protocol studies ahead of time just as we do for MRI and CT. We will assist physicians deciding whether a study requires planar imaging, SPECT imaging, or SPECT-CT based on the history provided by the physician, therefore the more information available, the easier it will be to determine the appropriate nuclear imaging examination.

Radiation Safety

SPECT-CT in conjunction with the nuclear scan will add very little radiation dose to the exposure from the nuclear scan itself. The dose for a bone scan would be approximately 4.4 mSv, and a SPECT-CT performed to include the thorax and abdomen would add up to 1.1 mSv. This is an anatomic mapping CT, and is a lower dose than would be expected for a standard diagnostic quality CT. If a myocardial Cardiolite scan were performed, the dose would be approximately 8.9 mSv for the nuclear scan, and an additional 0.4 mSv for the CT attenuation correction scan. For correlation purposes, a four view mammogram provides 0.5-0.7 mSv of radiation exposure.

Who to Call with Questions

If physicians have questions or suggestions, we will be happy to discuss them. The easiest method to contact one of us is at 231.935.6408, and ask the file room personnel to connect you with the nuclear medicine physician of the day. If you would like one of us specifically, the file room personnel will be happy to transfer your call to our desk if we are available or page one of us to a number of your choice.

I am certain that you and your patients will be very happy to have local and regional access to this exciting new cutting edge technology. Grand Traverse Radiologists and Munson Medical Center continue to demonstrate their dedication and commitment providing the best care possible for our local and regional patients, as well as visitors to the area needing medical attention.

DIAGNOSTIC RADIOLOGY

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