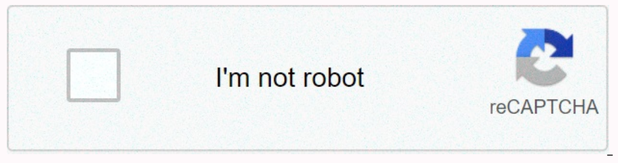

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Computed tomography guidance for stereotactic localization cpt code

Description Computed tomography (CT), sometimes called computerized tomography or computer axial tomography (CAT), is a non-invasive medical examination or procedure that uses specialized X-ray equipment to produce cross-sectional images of the body. Each cross-sectional image represents a slice of the person being depicted, like the slices in a loaf. These cross-sectional images are used for a variety of diagnostic and therapeutic purposes. CT scans can be performed in all regions of the body for a variety of reasons (e.g. diagnostic, treatment planning, intervention or screening). Most CT scans are performed as outpatient procedures. Here's how a CT system works: A motorized table moves the patient through a circular opening in the CT imaging system. While the patient is inside the opening, an X-ray source and a detector device rotate in the system around the patient. A single rotation usually takes a second or less. During rotation, the X-ray source produces a narrow, fan-shaped beam of X-rays passing through part of the patient's body. Detectors in rows opposite the X-ray source detect the X-rays passing through the patient's body as a snapshot in the process of making an image. Many different snapshots (at many angles through the patient) are collected during a complete rotation. For each rotation of the X-ray source and detector device, the image data is sent to a computer to reconstruct all the individual snapshots into one or more cross-sectional images (slices) of internal organs and tissues. CT images of internal organs, bones, soft tissues and blood vessels provide greater clarity and more detail than conventional X-rays, such as a chest X-ray (see Figures 3 and 4). Figure 2: The red lines on the patient's body are light from a laser adjustment system Using CT is a valuable medical tool that can help a doctor: Diagnosing disease, trauma or abnormality Plan and supervising interventional or therapeutic procedures Monitoring the effectiveness of treatment (e.g. cancer treatment) Benefits /risks When used correctly, the benefits of a CT scan far exceed the risk. CT scans can provide detailed information to diagnose, schedule treatment for and evaluate many conditions in adults and children. In addition, the detailed images from CT scans can eliminate the need for exploratory surgery. Concerns about CT scans include the risk of exposure to irionizing radiation and possible reactions to intravenous contrast agent, or dye, which can be used to improve visualization. Exposure to irritating radiation can lead to a slight increase in a person's lifetime risk of developing cancer. Exposure to irionization radiation is particularly important in paediatric patients because the cancer risk per unit dose of iionizing radiation is higher for younger patients than adults, younger younger has a longer lifespan for the effect of radiation exposure to manifest itself as cancer. But in children and adults, the risk of a medically necessary imaging exam is quite small compared to the benefit of accurate diagnosis or intervention. It is especially important to ensure that CT scans in children are performed with appropriate exposure factors, as the use of exposure settings designed for adults can result in a greater radiation dose than necessary to produce a useful image for a pediatric patient. Further information on the benefits and risks of X-ray imaging, including CT, can be found on the medical X-ray imaging website. Information for patients and parents If a doctor recommends a CT scan for you or your child, the FDA encourages you to discuss the benefits and risks of the CT scan, as well as any previous X-ray procedures you or your child have had with your doctor. A CT scan should always be performed if it is medically necessary and other exams using no or less radiation are unsuitable. At this point, the FDA does not see an advantage for whole-body scanning of people without symptoms. More resources on CT exams: Information for healthcare professionals FDA has regulations covering safety and effectiveness and radiation control of all X-ray imaging devices, including CT. Individual states and other federal agencies regulate the use of CT devices through recommendations and requirements for personnel qualifications, quality assurance and quality control programs and facility accreditation. Exam improvement: CT screening guidelines and random findings The individual risk from a required imaging test is quite small compared to the benefit of helping with accurate diagnosis or intervention. However, the FDA recommends that health care providers and hospital administrators work to reduce radiation exposure for patients by following these steps: Discuss the rationale for the survey with the patient and/or parents to ensure that there is a clear understanding of benefits and risks. Justify CT exams by: make sure that the CT exam is necessary to answer a clinical question, considering other examinations that use less or no radiation exposure, such as ultrasound or MRI, if appropriate, and, check the patient's medical imaging history to avoid duplicate examinations. These precautions are especially important with pediatric patients, since children are more susceptible to radiation effects than adults. In addition to referral criteria (also called appropriate use), screening guidelines are an important tool available to the referring physician to determine whether a particular CT examination is warranted. Optimization: quality assurance of the plant (QA) and personnel training The imaging team (e.g. doctor, radiological technologist and medical physicist) use techniques and protocols that administer the lowest radiation radiation which will provide an image quality sufficient for diagnosis and intervention. Additional resources specific to radiation therapy in CT include: Industry information: CT manufacturers and assemblers FDA regulate manufacturers of CT devices through Electronic Product Radiation Control (EPRC) and medical device regulations in federal law. CT devices are classified under 21 CFR 892.1750. THE EPRC requirements and guidance specific to CT devices include: For more information about the EPRC and medical device regulations and guidance for CT and other X-ray equipment, see the Medical X-Ray Imaging website. Reporting problems to FDA-rapid reporting of side effects can help the FDA identify and better understand the risks associated with the product. We encourage healthcare professionals and patients who suspect a problem with a medical imaging device to submit a voluntary report through MedWatch: FDA Safety Information and Adverse Event Reporting Program. Healthcare professionals employed at facilities subject to reporting phase events (medical devices) should follow the reporting procedures set out by their facilities. Manufacturers of medical devices, distributors, importers and user facilities for devices (which include many healthcare facilities) must comply with reporting events (medical devices). In addition to following the general recommendations (for manufacturers, facilities and any member of the public) for reporting issues of adverse reactions related to CT overexposure, the following information should be included in reports, if available: the protocol you followed during the event; CT conditions of operation (it wants technical parameters, including kVp, mA, time per rotation, mAs, mode, etc.); and dose index values shown (CTDIvol, DLP). Additional resources Figure 1: Chest X ray Image All X-ray image is based on absorption of X-rays as they pass through the various parts of the patient's body. Depending on the amount absorbed into a specific tissue such as muscle or lung, another amount of X-rays will pass through and out of the body. The amount of X-ray absorbed contributes to the radiation dose of the patient. During conventional X-rays, the exciting X-rays interact with a detection device (X-ray film or other image receptor) and provide a 2-dimensional projection image of the tissues of the patient's body - an X-ray-produced photograph called an X-ray graph. Chest x ray (Figure 1) is the most common medical imaging examination. During this examination, a picture of the heart, lungs and other anatomy is recorded on the film. back to top Computed tomography (CT) Figure 2: Cross-sectional image of abdomen Although also based on variable absorption of X-rays of different tissues, computed tomography (CT) imaging, also known as CAT scanning (Computerized Axial provides another form of imaging known as cross-sectional image. The origin of the word tomography is from the Greek word tomos which means slice or section and graph meaning drawing. A CT imaging system produces cross-sectional images or slices of anatomy, such as slices in a loaf of bread. The cross-sectional images (Figure 2) are used for a variety of diagnostic and therapeutic purposes. Information about CT screening of the whole body can be found here: back to the top How a CT system works Figure 3: Patient in CT Imaging System A motorized table moves the patient (Figure 3) through a circular opening in the CT imaging system. As the patient passes through the CT imaging system, a source of X-rays rotates around the inside of the circular opening. A single rotation takes about 1 second. The X-ray source produces a narrow, fan-shaped beam of X-rays used to irradiate part of the patient's body (Figure 4). The thickness of the fan beam can be as small as 1 millimeter or as large as 10 millimeters. In typical examinations there are several phases; Each consists of 10 to 50 rotations of the X-ray tube around the patient in coordination with the table moving through the circular opening. The patient may receive an injection of a contrast material to facilitate visualization of vascular structure. Detectors on the exit side of the patient detect the X-rays that exit the part of the patient's body that is irradiated as an X-ray snapshot at a position (angle) of the source of X-rays. Many different snapshots (angles) are collected during a complete rotation. The data is sent to a computer to reconstruct all the individual snapshots to a cross-sectional image (piece) of internal organs and tissues for each complete rotation of the source of X-rays. back to the top Advances in Technology and Clinical Practice Figure 4: CT Fan Beam Today, most CT systems are capable of spiral (also called spiral) scanning as well as scanning in the previously more conventional axial mode. In addition, many CT systems are able to image of multiple washers simultaneously. Such advances allow relatively larger amounts of anatomy to be depicted in relatively shorter time. Another advance in the technology is electron beam CT, also known as EBCT. Although the principle of creating cross-sectional images is the same as for conventional CT, either single- or multi-slice, the EBCT scanner requires no moving parts to generate the individual snapshots. As a result, the EBCT scanner allows a faster image acquisition than conventional CT scanners. Image copyright © 2002, GettyImages returns to top necessary reports for the industry