



LightSpeed VCT



LIGHTSPEED VCT – VOLUME COMPUTED TOMOGRAPHY

Description and Overview

The LightSpeed VCT, the world's first Volume CT system, is the latest innovation in computed-tomography (CT) technology and the flagship system in GE's LightSpeed® family of CT scanners. "VCT" stands for "Volume Computed Tomography." LightSpeed VCT ushers in the next generation of CT imaging by offering game changing clinical applications in neurology, cardiology and trauma.

The LightSpeed VCT can capture images of a beating heart in five heartbeats or an organ in a second, and can perform whole body trauma in ten seconds, more than twice as fast as conventional multi-slice CT scanners. And it does so without sacrificing clarity – its sub-millimeter resolution offers spectacular views of veins and arteries. For physicians volume coverage means new diagnostic power, including the ability to routinely perform CT angiography, rapid tests for ER stroke and chest pain, and whole body trauma.

LightSpeed VCT Featured Procedures

- **5-Beat Cardiac™** - The ability to provide a comprehensive view of the heart and coronary arteries with sub-millimeter resolution in just 5 heartbeats. The LightSpeed VCT's broad coverage and speed helps reduce the artifacts caused by beat-to-beat variability - resulting in more robust, repeatable procedures, greater vessel visualization and shorter breath holds for sick or elderly patients.
- **Triple RuleOut™** - The ability to help clinicians rule out (or in) three of the most life-threatening critical conditions in chest pain in one single scan - aortic dissection, pulmonary embolism and coronary artery disease.
- **Stroke WorkUp** - Once a stroke occurs, it is commonly believed that treatment must be delivered within an hour or less to ensure the best outcome for the patient. The LightSpeed VCT offers the speed and resolution required for rapid examination of blood vessels in the brain (perfusion studies). This enables physicians to make a quick diagnosis and determine the best course of treatment while reducing the number of exams a patient may need to undergo.

Other Typical LightSpeed VCT Procedures

- CT colonography
- Cardiac and coronary vessel analysis (5-Beat Cardiac™)
- Coronary artery calcification scoring
- Angiography studies
- Stroke workup
- Oncology/cancer care
- Pulmonary emboli
- Inner ear ailments
- Spinal injuries

- Abdominal injuries
- Pediatric assessment
- Kidney exams
- Liver exams
- Lung exams

Patient Benefits

- Diagnostic option for the workup of a cardiac patient
- Faster patient exams – capture images of a beating heart in five heartbeats, a single organ in one second, and perform whole body trauma in ten seconds
- Less time needed for breath holds, which can mean less stress for the patient
- Automated dose reduction features
- Easier access/wheelchair access to patient table – lower table height
- Breathing lights help coach patients through breath holds – making it an easier exam

Physician Benefits

- Full suite of applications to assist in examination of the head, abdomen, spine and chest
- Xtream™ FX workflow platform allows the physician to review the case within five to ten minutes
- The technologist performs the exam, allowing the Physician to interact with patient during the exam
- Provide referring physicians with customized patient reports
- Automatic reformatting of images to the clinical views needed to help the physician make the diagnosis
- Scans as fast as 0.35 seconds per rotation. Variable speed capability as well. Higher-speed scanning translates to clearer, sharper images with fewer artifacts caused by patient movement or the motion of a beating heart

CT Technologists Benefits

- Highly automated operation – designed for single-technologist operation. The imaging process is so automated that the operator only needs to choose from a list of scan protocols, plan the scan, and push start. The system reconstructs, films, networks and archives automatically
- Automated dose reduction features and pediatric protocols
- Patient table designed to handle patients up to 500 lbs
- Productivity and ergonomic enhancements – features that save technologists time and steps:
 - Remote gantry tilt (from inside the control room)
 - In-room start (from inside the exam room)
 - Front and back gantry controls
 - Patient breathing lights with countdown timer
 - IV pole and instrument tray that move with the patient table

Key Technology/Key Components

- V-Res™ detector is what makes Volume CT imaging possible. A unique backlit detector with a true 64-channel design. Based on GE's patented HiLight™ scintillator material, this detector increases high resolution volume coverage by a factor of four when compared with a 16-slice detector – delivering high-resolution, isotropic (microVoxel™) imaging at its finest.
- Performix® Pro X-ray tube meets the unprecedented demands on X-ray sources with industry leading image quality, peak power and total throughput. Backed by a powerful generator, Performix Pro delivers the highest peak mA capability in the market today – up to 800 mA. Image small structures and see greater critical detail in CTA runoffs, aortic dissections and other challenging exams – on even the largest patients.
- Volara™ is GE's new digital DAS (Data Acquisition System) that delivers high processing power for high quality images and low dose performance.
- Xtream™ FX is LightSpeed VCT's workflow solution. Xtream FX enables healthcare practices to keep pace with the large volume of data by delivering accelerated reconstruction speed, image quality and flexibility to provide an optimized volumetric workflow solution from acquisition to final report. The speed of image reconstruction allows physicians to take advantage of volume acquisition and seamlessly handle large datasets without sacrificing productivity time. In addition, Xtream FX offers new review "effects," such as direct MPR (multi-planar reformatting) that directly displays images in 3D views without the wait for post-processing reconstruction.

Relevant Statistics

- An estimated 100 million CT scans are performed annually around the world, including nearly 50 million in the United States.
- More hospitals choose GE LightSpeed® multi-slice scanners than all competitive brands combined.
- For the approximately 5 million individuals who present in the Emergency Department with chest pain each year, only a fraction are actually having a heart attack.
- According to the American Heart Association:
 - Since 1900, cardiovascular disease has been the number 1 killer in the United States every year but in 1918. Nearly 2,600 Americans die of cardiovascular disease each day, an average of 1 death every 34 seconds.
 - In 2002, an estimated 6,813,000 inpatient cardiovascular operations and procedures were performed in the U.S.; 4.0 million were performed on males and 2.8 million were performed on females.
 - From 1979 - 2002, the number of cardiac catheterizations increased 389 percent.
 - An estimated 1,463,000 inpatient cardiac catheterizations were performed in 2002; Average length of a patient's hospital stay is 3.6 days

About GE Healthcare

GE Healthcare provides transformational medical technologies that will shape a new age of patient care. GE Healthcare's expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, disease research, drug discovery and biopharmaceuticals is dedicated to detecting disease earlier and tailoring treatment for individual

patients. GE Healthcare offers a broad range of services to improve productivity in healthcare and enable healthcare providers to better diagnose, treat and manage patients with conditions such as cancer, Alzheimer's and cardiovascular diseases.

GE Healthcare is a \$14 billion unit of General Electric Company (NYSE: GE) that is headquartered in the United Kingdom. Worldwide, GE Healthcare employs more than 42,500 people committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.

Basic CT Concepts for Media

Computed Tomography (CT) System, also known as a "CAT Scan" is a medical diagnostic tool that allows the visualization of internal structures within the human body. This aids physicians in diagnosing disease, viewing internal abnormalities and assessing the extent of trauma damage.

During a typical CT procedure, the patient is placed on a table. The table then moves the patient through the gantry (a donut-shaped device), which houses an X-ray tube and detector array. For each image acquired, the X-ray tube rotates around the patient and the X-rays pass through the patient to the detector array, and thousands of X-ray measurements are acquired. The computer then processes this information and displays the corresponding images on a computer screen. This imaging technique avoids any superimposition of organs or tissues upon one another that might occur during other types of X-ray tomographic studies.

The CT exam creates images analogous to a single slice of bread from a whole loaf or a slice from an orange. Hence, the word 'slice' is often used to describe a view of patient anatomy. The quality of an image depends on the nature of the X-ray source and detectors, the number and speed of the measurements made, the details of the reconstruction technique (algorithm), the machine characteristics, and the methods of data display and interpretation. The computer allows healthcare professionals to shade, rotate, correlate and measure anatomy in the image. This data can be manipulated to derive even more precise clinical information. While conventional X-ray can discern tissue density difference of five percent, CT can distinguish a density difference of 1 percent or less, aiding in diagnostic confidence.