North Carolina Department of Health and Human Services
Division of Health Service Regulation

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

Drexdal Pratt
Division Director

April 3, 2014

Dee Jay Zerman
Director of Regulatory Planning
211 Friday Center Drive, Suite G015
Chapel Hill, NC 27515

Exempt from Review – Acquisition of Facility
Facility: UNC Hospitals
Project Description: Replacement of an existing CT scanner
County: Orange
FID #: 923517

Dear Ms. Zerman:

In response to your letter of March 14, 2014, the above referenced proposal is exempt from certificate of need review in accordance with G.S 131E-184(a)(7). Therefore, you may proceed to acquire, without a certificate of need, the Somatom Definition AS 64-slice CT scanner, Model Number 14420859 to replace the existing Somatom Sensation 16-slice CT scanner, Model Number 44635688 and serial Number 6702. This determination is based on your representations that the existing unit will be removed from North Carolina and will not be used again in the State without first obtaining a certificate of need. Further please be advised that as soon as the replacement equipment is acquired, you must provide the CON Section and the Medical Facilities Planning Branch with the serial number of the new equipment to update the inventory, if not already provided.

Moreover, you need to contact the Construction Section to determine if they have any requirements for development of the proposed project.

It should be noted that this Agency's position is based solely on the facts represented by you and that any change in facts as represented would require further consideration by this Agency and a separate determination. If you have any questions concerning this matter, please feel free to contact this office.

Sincerely,

F. Gene DePorter
Project Analyst

Martha J. Frisone, Interim Chief
Certificate of Need Section

cc: Construction Section, DHSR
Medical Facilities Planning Branch, DHSR

UNC HOSPITALS

Hedrick Building
211 Friday Center Drive, Suite G015
Chapel Hill, NC 27517

March 14, 2014

Mr. F. Gene DePorter, Project Analyst
Certificate of Need Section
Division of Health Service Regulation, DHHS
Mail Service Center 2704
Raleigh, NC 27699-2704

RE: Request for Exemption / Replacement of an existing CT scanner / UNC Hospitals

Dear Mr. DePorter:

UNC Hospitals is planning to replace the CT scanner, referred to as ACC CT Scanner, and is requesting a determination that the replacement of this equipment is exempt from review pursuant to NCGS §131E-184(7). The existing CT scanner was placed in service in 2002, and is used on a daily basis. The 16-slice ACC CT scanner is built on older technology that is not compatible with today's software leading to poorer image quality, use for limited patient population, and inability to reduce radiation dose. Replacement of this CT scanner with newer technology will allow for a reduction in radiation dose by up to 60% while obtaining superior image quality leading to more accurate image interpretation and diagnostic value. We are supplying the following information that the CON Section has requested in the past as a part of its general information request for an equipment replacement exemption.

1. A comparison of the existing and replacement equipment, using the format in the following table:

Equipment Comparisons

ACC CT	*Existing Equipment*	*Replacement Equipment*
Type of Equipment (List each component)	SOMATOM Sensation 16-slice CT scanner	SOMATOM Definition AS 64-slice CT scanner
Manufacturer of Equipment	Siemens Medical Solutions USA, Inc.	Siemens Medical Solutions USA, Inc.
Tesla Rating for MRIs	Not applicable	Not applicable
Model Number	4463688	14420859
Serial number	6702	To be determined
Provider's Method of Identifying Equip	By model & serial #s	By model & serial #s
Specify if Mobile or Fixed	Fixed	Fixed
Mobile Trailer Serial Number/ VIN #	Not applicable	Not applicable
Mobile Tractor Serial Number/ VIN #	Not applicable	Not applicable

Date of Acquisition of Each Component	June 1, 2002	To be 2014
Does Provider Hold Title to Equipment or Have a Capital Lease?	UNC Hospitals owns the equipment	UNC Hospitals will own the equipment
Specify if Equipment Was/Is New or Used When Acquired	New	Will be new
Total Capital Cost of Project (Including Construction, etc.)	$996,020 for cost of equipment; Records for construction/renovation costs not available	$971,331 See Exhibit 1.
Total Cost of Equipment	$996,020	$961,831
Fair Market Value of Equipment	Unknown	$961,831
Net Purchase Price of Equipment	$996,020	$961,831
Locations Where Operated	UNC Hospitals' Ambulatory Care Center (ACC)	UNC Hospitals' Ambulatory Care Center (ACC)
Number of Days In Use/To be Used in N.C. Per Year	365 days	365 days
Percent of Change in Patient Charges (by Procedure)	NA	No change
Percent of Change in Per Procedure Operating Expenses (by Procedure)	NA	No change
Type of Procedures Currently performed on Existing Equipment	Diagnostic CT imaging	NA
Type of Procedures New Equipment is Capable of Performing	NA	Diagnostic CT imaging

2. A description of the basic technology and functions of the existing and replacement equipment, including the diagnostic and treatment purposes for which the equipment is used or capable of being used.

Response: The existing Siemens SOMATOM Sensation 16-slice CT scanner will be replaced with a Siemens SOMATOM Definition AS 64-slice CT scanner. Both systems are used to perform diagnostic CT imaging studies using computer-processed x-rays to obtain cross-sectional images of the body. The current system allows for the provision of diagnostic imaging studies. The replacement CT scanner will provide state-of-the-art diagnostic imaging and radiation dose reduction for patients. The Siemens SOMATOM Definition AS 64-slice CT scanner also produces more slices per rotation allowing for improved image resolution and superior anatomical detail. The system also has a larger bore size allowing for accommodation of bariatric patients previously unable to benefit from the ACC CT scanner technology.

3. Brochures or letters from the vendors describing the capabilities of the existing equipment and the replacement equipment.

Response: A copy of the existing Siemens SOMATOM Sensation 16-slice CT scanner quote and purchase order is attached as Exhibit 2. A copy of a brochure from the vendor describing the proposed replacement Siemens SOMATOM Definition AS 64-slice CT scanner is attached as Exhibit 3.

4. A copy of the purchase order for the existing equipment, including all components and original purchase price.

Response: A copy of the original purchase order and quote is attached as Exhibit 2.

5. A copy of the title, if any, for the existing equipment or the capital lease for the existing equipment.

Response: Not applicable. The equipment does not have a title and will not be leased.

6. If the replacement equipment is to be leased, a copy of the proposed lease that transfers substantially all the benefits and risks inherent in the ownership of the equipment to the lessee of the equipment, in accordance with criteria in Generally Accepted Accounting Principles (GAAP).

Response: Not applicable. The replacement equipment will not be leased.

7. If the replacement equipment is to be purchased, a copy of the proposed purchase order or quotation, including the amount of the purchase price before discounts and trade-in allowance.

Response: A copy of the quote received from Siemens for the replacement CT scanner is attached as Exhibit 4.

8. A letter from the person taking possession of the existing equipment that acknowledges the existing equipment will be permanently removed from North Carolina, will no longer be exempt from requirements of the North Carolina Certificate of Need law, and will not be used in North Carolina without first obtaining a new certificate of need.

Response: The vendor, Siemens, will take possession of the unit and remove it from the site as Siemens installs the replacement unit. The unit will be taken out of state by Siemens and will not be used in NC without obtaining certificate of need approval.

9. Documentation that the existing equipment is currently in use and has not been taken out of service.

Response: UNC Hospitals currently has nine operational CT scanners as identified on the most recent 2014 Licensure Renewal Application Form. This CT scanner is one of these units.

Exhibit 1 contains a completed 'Proposed Total Capital Cost of Project' form which projects the total capital cost of this replacement project to be $971,331 for the Siemens SOMATOM Definition AS 64-slice CT scanner, including installation and the required electrical renovation. The total project cost includes all costs required to make the unit operational. Since the room already exists, equipment and furniture will be reused. Beyond the items included in this estimate, no additional renovations, equipment or furniture will be required for this project.

Please do not hesitate to contact me at 919-966-1129 if you need any additional information. Thank you for your prompt consideration of this matter.

Sincerely,

Dee Jay Zerman

Dee Jay Zerman, Director of Regulatory Planning
UNC HCS

PROPOSED TOTAL CAPITAL COST OF PROJECT

UNC Hospitals' ACC CT Scanner Replacement

A. **Site Costs**				
(1) Full purchase price of land		$0		
Acres _____ Price per Acre $_____				
(2) Closing costs		$0		
(3) Site Inspection and Survey		$0		
(4) Legal fees and subsoil investigation		$0		
(5) Site Preparation Costs				
(6) Other (Specify)		$0		
(7) Sub-Total Site Costs			$0	
B. **Construction Contract**				
(8) Cost of Materials				
General Requirements	$800			
Concrete/Masonry	$1,400			
Woods/Doors & Windows/Finishes	$600			
Sub-Total Cost of Materials		$2,800		
(9) Cost of Labor		$1,200		
(10) Other (Specify)		$0		
(11) Sub-Total Construction Contract			$4,000	
C. **Miscellaneous Project Costs**				
(12) Building Purchase		$0		
(13) Fixed Equipment Purchase		$961,831		
(14) Movable Equipment Purchase		$0		
(15) Furniture		$0		
(16) Landscaping		$0		
(17) Consultant Fees				
Architect and Engineering Fees	$3,500			
Sub-Total Consultant Fees		$3,500		
(18) Financing Costs (e.g. Bond, Loan, etc.)		$0		
(19) Interest During Construction		$0		
(20) Other (Construction Contingency)		$2,000		
(21) Sub-Total Miscellaneous			$967,331	
(22) **Total Capital Cost of Project (Sum A-C above)**				$971,331

I assure that, to the best of my knowledge, the above capital costs for the proposed project are complete and correct and that it is my intent to carry out the proposed project as described.

Director of Regulatory Planning
(Title & Signature of Office Authorized to Represent Provider/Company)

UNC HOSPITALS
LAWSON PURCHASE REQUISITION

CT FILE COPY

BUDGET APPROVAL
Initials:
Date:
Exhibit 2

Purchasing Department Only	Requesting Department	Dept. Req. No.	Hospital Requisition No.
CAPITAL EQUIPMENT (FY 02)	COMPUTERIZED TOMOGRAPHY		359515
	Requisition Date: 03/15/2002	Delivery Needed By: ASAP	Lawson Requisition No.
	Purchasing Agent: MARNIE LANGMAN-RICHARDSON		Purchase Order No. 1124447

SUGGESTED VENDORS

SIEMENS MEDICAL SOLUTIONS USA, INC		QUOTE :10094707
CT		DATE OF QUOTE: 03/12/2002

ACCOUNTING DATA/ACTIVITY				DELIVER TO: (Dept., Room No. & Bldg)	DEPT. CONTACT NAME AND PHONE
Company	Accounting Unit	Account No.	SubAccount	NEUROSCIENCES HOSPITAL BASEMENT	GWEN MANN/6-4077
1000	220110	200700			
Activity Accounting Unit		Account Category			

Hospital/Lawson Quote No.	SHIP TO: Hospital Receiving	SHIP INSURED VIA:	Best Way ☒	UPS ☐	Air Express ☐
	Other	Other			

F.O.B.	FREIGHT:	TERMS:	State Bid #
Destination ☒ Shipping Point ☐	Prepaid ☒ Prepaid & Add to Inv. ☐ Other:	80% - Delivery 20% - Acceptance	
		Vendor Ref. #	State Cert. #

Item No.	Qty	UOM	Catalog No.	Description—If For a Standard Order State Duration. (Give complete description – Manufacture's Name, Size, etc.)	Actual/Est. Unit Price	Extended Price
	1	EA	CTSNSOO	CT SOMATOM SENSATION SYSTEM	996,020.00	996,020.00
				(AS PER ATTACHED SPECIFICATIONS)		

Marnie Campbell 3/15/02

Department/Division Signature: Michael [illegible] 3/15/02

Phone Number: 6-7341

E-Mail Name

Sub Total	996,020.00
Tax	
Order Total	

115 REV 05/1998 HSR 06-092770

REFER TO UNC HOSPITALS BUSINESS POLICES & PROCEDURES FOR INSTRUCTIONS

SIEMENS

Siemens Medical Solutions USA, Inc.
186 WOOD AVENUE SOUTH · ISELIN, NJ 08830-0401
(732) 321-4600 FAX (732) 494-2250

UNC HOSPITALS

101 MANNING DRIVE
CHAPEL HILL NC 27514

QUOTE REFERENCE	
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Siemens' REPRESENTATIVE	PAGE
William Bennett	1 of 23

LOCAL OFFICE - Greensboro
Siemens Medical Solutions USA, Inc.
7616 F-Business Park Drive
Greensboro, NC
27409-9302
Phone: 1-800-950-1126 Fax: 336-668-0885
336-668-0965

INQUIRIES REGARDING THIS QUOTATION SHOULD REFER TO QUOTE NUMBER AND BE DIRECTED TO THE LOCAL SALES OFFICE

Siemens Medical Solutions USA, Inc., is pleased to submit the following quotation for the products and services described herein at the stated prices and terms, subject to your acceptance of the terms and conditions on the face and back hereof, and on any attachment hereto.

SENSATION 16 CT System

This system contains NO WARRANTY. The first year of service will be covered under a Siemens service contract. The first year contract total will be $120,000. This amount DOES NOT include glassware, which is covered on a pro-rated basis.

TERMS OF PAYMENT:

00% Down, 80% Delivery, 20% Installation

WARRANTY: See specific product line attachment definitions.

Siemens Medical Solutions USA, Inc.

SUBMITTED BY: William Bennett (signature)
NAME: William Bennett
TITLE: Siemens' REPRESENTATIVE
DATE: 03/12/2002

DELIVERY SUBJECT TO AVAILABILITY : 09/01/2002
FOB - SHIPPING POINT
FREIGHT CHARGES AND TAXES, IF ANY, ARE PAYABLE UPON RECEIPT OF INVOICE.
THIS QUOTATION IS IN US DOLLARS AND IS VALID FOR 45 DAYS.

CUSTOMER'S ACCEPTANCE

BY : (signature)
NAME :
TITLE :
DATE :

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ITEM	QTY.	CATALOG NO.	PRODUCT DESCRIPTION	PRICE
000100	1	CTSNS00	CT SOMATOM SENSATION 16	
	1	4463688	SOMATOM SENSATION 16	

The SOMATOM Sensation 16 Multi-Slice Spiral Computed Tomograhy Scanner is capable of acquiring up to 32 slices per second while maintaining highest possible image quality. The examination efficiency is significantly improved by the throughput-optimized architecture of the syngo based WorkStream. user platform, which was specifically designed for Multi-Slice CT, to provide maximum possible clinical information in the most efficient way. Advanced clinical applications provide a wide range of possibilities for referring physicians and, thus, an improved competitive position.

The SOMATOM Sensation 16 is based on super fast slip ring technology and enables multislice CT examinations with a temporal resolution of up to 105 ms. The considerably improved performance capability opens up completely new dimensions in general and specialized CT applications (e.g. cardio, pulmonary, perfusion). With examinations in 0.75 mm thin-slice technique the diagnostic value of high-resolution CT is greatly improved. The resulting data files are ideally suited for 2D/3D postprocessing.

SOMATOM Sensation 16 employs the Adaptive Array Multirow Detector system, based on the Siemens UFC (ultra fast ceramics) detector material. The Adaptive Array Detector features extreme flexibility in the choice of slice thickness in combination with outstanding sampling speed and dose efficiency in order to optimally adapt the examination to clinical requirements.

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SOMATOM Sensation 16 enables the fast acquisition of large volumes with outstanding resolution along the longitudinal body axis, with 16 slices per rotation. The fast rotation time of 0.5 s with up to 32 slices per second and a temporal resolution of up to 125 ms opens the door to new CT applications. Organs such as the heart and lungs can be imaged virtually motion-free. A high-resolution lung study with 30 cm volume scan length and 16 x 0.75 mm collimation can be acquired within approximately 8 seconds. This reduces the breath-hold phases significantly, at the same time leading to an improvement in image quality and patient comfort.

SOMATOM Sensation 16 works more effectively regarding dose efficiency and is thus more cost saving than previous CT systems. This system includes C.A.R.E. Solutions, a combination of techniques, which help to significantly reduce patient dose and usage of contrast media, while preserving diagnostic image quality. C.A.R.E. Bolus delivers CM-enhancement-triggered data acquisition and C.A.R.E. Dose reduces exposure by modulating dose according to the attenuation profile of the patients body parts.

SOMATOM Sensation 16 utilizes WorkStream. for ultimate work efficiency. Designed specifically and exclusively for Multi-Slice CT, the SOMATOM WorkStream. user platform improves examination efficiency and optimizes clinical workflow and therefore patient throughput. The user is presented with a simple, intuitive workspace that flows seamlessly between 2 independent consoles, the Navigator and the Wizard. A variety of advanced clinical applications provide a wide range of possibilities for referring physicians and thus an improved competitive position.

Gantry:
Continuously rotating, highly efficient tube and detector unit with unique short geometry provides superior dose efficiency, particularly in comparison with other Multi-Slice designs.

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* 70 cm gantry aperture for very large patients and additional access to the patient for preparation and interventional examinations
* Standard rotation speed of the gantry: 120 rpm with a rotation time of 500 ms
* +/- 30 degree gantry tilt for head and spine studies
* Multi-Slice spiral acquisition available with tilted gantry
* Easy fluid removal ensures clean environment
* Sealed gantry with no exhaust fans ensures quiet and dust-proof operation
* All heat generated by gantry components is removed via an external heat exchanger, allowing full power operation with virtually no heat generated in the examination room. Ensures a comfortable environment for the patient, regardless of season or heavy usage.

Patient table:
Integrated Interventional CT (ICT) table design for easy patient positioning and equipped for CT image guided fluoroscopic procedures.

* 48 cm to 102 cm vertical travel range allows easy patient positioning for all types of patients
* 157 cm horizontal scanable range including head holder eliminates the need to reposition the patient to examine various anatomy.
* +/- 0.5 mm positioning accuracy (both incremental and random table feed) allows full access to the patient in the middle of an examination without having to repeat a topogram to localize anatomy
* 450 lb. (200 kg) maximum table load (with guaranteed positioning accuracy)
* 0.5 mm stepped remote-controlled table feed
* Table operation possible from both sides of the gantry
* Manual operation possible in the case of emergency stop or power failure
* Positioning aids help immobilize the anatomy while maintaining patient comfort during the examination. Positioning aids delivered with the scanner: Couch mattress, headrest/armrest, carbon-fiber headrest with head wedges, headrest, knee/leg support, paper roll holder, three stabilizing straps, cushion in three different sizes and soft straps for immobilizing the patients head. Supplementary positioning aids optional.

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X-Ray Tube Assembly/X-ray Generator
Siemens DURA Akron Q high-performance CT x-ray tube assembly with Flying Focal Spot allows a doubling of projections for high resolution, virtually artifact-free imaging throughout the entire 50 cm scan field in all scan modes. Tube assembly with DURA Akron Q rotating-anode x-ray tube with CALOREX compound anode with a maximum tube power of 60 kW.

* Rotating-anode tube with CALOREX compound anode rotating at 4800 rpm.
* Computer-controlled anode monitoring.
* Two focal spots with sizes 0.5 x 0.7 mm and 0.8 x 1.2 mm (according to IEC 336/93).
* Anode heat storage capacity: 5.3 MHU or 3.9 MJ (according to IEC 613).
* Maximum power rating: 60 kW.
* Maximum voltage rating: 140 kVp max.
* X-ray current range: 28-500 mA.
* Closed-loop tube cooling system with continuous heat dissipation of up to 7 kW. All heat generated by the x-ray generator or x-ray tube is removed via an external heat exchanger, allowing the full power operation with virtually no heat generated in the examination room. Ensures a comfortable environment for the patient, regardless of season or heavy usage.

Detector System
The CT Detector system is based on the patented UFC. (Ultra Fast Ceramics) material with unique high-contrast and low-contrast specifications. Its Adaptive Array Detector (AAD) configuration is optimized for highest volume coverage combined with z-resolution, highest dose efficiency and best low contrast resolution.

* Adaptive Array Detector (AAD) system
* UFC. (Ultra Fast Ceramics) with 16128 elements in 24 rows
* 1344 active detector channels per slice
* Up to 2320 projections per 360° rotation

Heat Exchanger

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Closed loop-cooling system for removal of heat generated by the gantry. Heat generated is not vented into the examination room.

* Cooling capacity: 13.5 KW maximum
* Transfer of heat from CT gantry, x-ray generator and detector assembly to chilled water system
* Reduced siting costs by eliminating the need for increased A/C in examination room
* Scanning large volumes without tube-cooling delays
* Helps increase x-ray tube life and performance

Uninterruptible Power Supply System

Uninterruptible power supply ensures optimal performance of the system, even when main power is lost. Both consoles, the Navigator and Wizard, will continue to operate up to 20 minutes after power interruption. This reduces risk of lost data and reexamination. Any existing raw data may be reconstructed and archived prior to system shutdown.

Control and Evaluation unit:

Control components, keyboard, CT control box and mouse for Navigator and Wizard console. Intercom system with user-programmable patient instruction system. Desks and computer cabinets optional. The software functionality of both consoles can be tailored to special clinical requirements with additional optional modality-specific application modules.

* Compact keyboards with integrated function keys and mouse control helps to keep the workspace clear
* Intercom for patient monitoring and instructions
* Automatic Patient Instruction System: Multiple messages or languages can be recorded for individual examinations like pediatric- or multilingual patients groups.
* Two (2) high-resolution, flicker-free 45 cm (18 in) color LCD monitors, with a 1280x1024 image display matrix and 75 frames/s refresh rate. Optimized for viewing of high dynamic range medical images.
* Image windowing and centering via digital potentiometers or mouse gives you the flexibility to choose the most convenient operation

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* Easy to learn syngo based graphical user interface based on common Windows industry standard.
* Multiple soft keys for rapid scan sequences and standardized protocols for reproducible examination quality.
* Full remote control of gantry and table such as patient positioning including table feed and gantry tilt

WorkStream. Computer system:

The SOMATOM Sensation 16 computer system consists of three components integrated into the syngo based WorkStream. platform. WorkStream. offers fully integrated and automated workflow management for tasks such as image reconstruction, 2D and 3D data processing, filming and image archiving. All three computers are connected to a common image database holding up to 100,000 images.

* Image Reconstruction Engine for the preprocessing and image reconstruction of CT data.
* Examination, including evaluation and management of the CT images.
* Wizard console, an integrated advanced post-processing console, for image evaluation, image management and advanced 2D and 3D post-processing.

The Image Reconstruction Engine has a cluster of high-performance processors, which preprocess and reconstruct the CT data with a reconstruction speed of up to 6 images per second. This computer is equipped with a high performance drive with 150 GB data capacity, corresponding to a raw data storage capacity of up to 650 feet (220m) of patient volume or approx. 600 lung examinations with a scan length of 30cm each.

The Navigator console consists of a high-performance computer with a 1.7 GHz Intel Pentium IV processor, 1 GB RAM, a high-speed 18GB system disk and a 73 GB high-speed image disk, corresponding to an image data storage capacity of approximately 100,000 images.

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The Wizard console consists of a high-performance dual-processor computer with two 1.7 GHz Intel Pentium IV processors, 1 GB RAM and two high-speed 18 GB hard disks. It is connected to the Navigator console via direct access to image database, allowing instant access to the examination data.

Both consoles, the Navigator and the Wizard, are equipped with a high-performance 650 MB CD recorder. This corresponds to a storage capacity of approximately 4800 images in 256 x 256 matrix or approximately 1200 images in 512 x 512 matrix in uncompressed format.

The software functionality of both consoles can be easily adapted to special clinical requirements by adding additional optional syngo based application.

syngo user Interface:
syngo features an intuitive and, thus, easy to learn user interface developed from prototypes tested in close cooperation with users. Syngo performs the examination in individual process steps on special task cards such as the patient registration, examination, viewing and filming. The user according to individual requirements can easily customize a number of functions and input parameters. Frequently repeated processes can be automated and saved as preferences.

Patient registration:
The system can accept patient data in different ways. These include manual entering the data via the keyboard or simply importing patient and examination data from a Radiological Information System (RIS) via .DICOM Get Worklist.. In emergency cases, fast registration is possible via a special Emergency Registration Button. Here, the system automatically assigns an emergency number, which can later be replaced by the actual patient number. The input profile can be individually customized.

Examination card:

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SOMATOM Sensation 16 comes with a large number of predefined examination protocols, making examination planning a very fast and efficient procedure. Example: A three-phase examination of the liver available as an independent protocol only needs to be adapted to the situation for the patient undergoing the examination. Each examination is represented pictorially as a so-called .chronicle., which views the individual phases of the examination separately. The advantage is that the individual phases of the examination can be accessed quickly and selectively. Changes to the protocol can be made easily via graphics operation by dragging and dropping via mouse. With a so-called routine window, it is possible to modify individual examination parameters, representing a subset of the important parameters and giving information at a glance about the parameterization of the examination.

Viewing card:
On the viewing card, it is possible to move interactively with the mouse through the image volume of the ongoing examination. The images of different examinations can be displayed in parallel for comparison. A large number of functions are available for evaluation, documentation and archiving.

Filming card:
A virtual film sheet shows a 1:1 display of the film sheets to be printed out, thus permitting an effective preview of filming jobs and rewindowing of images, as well as providing a large number of evaluation functions. The printout parameters for the ongoing autofilming process running parallel to acquisition or reconstruction are also defined with the filming card.

Other optional task cards are available.

C.A.R.E. Solutions - Combined Applications to Reduce Exposure:
Each SOMATOM Sensation 16 CT includes C.A.R.E. Solutions to optimize patient care with excellent image quality, reduced exposure to x-rays and contrast media. Following modules will come with the scanner:

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C.A.R.E. FILTER:
Operating mode reducing patient exposure for all examinations by:
* Suppression of off-focal radiation at the x-ray source
* Reduction of scattered radiation in the patient.
* Filtering of low energy x-rays which do not significantly contribute to image quality

C.A.R.E. Topogram:
Real-Time Display of the .growing. Topogram enabling the user to stop the examination at any time to avoid unnecessary radiation delivered to the patient.

C.A.R.E. Bolus:
Operating mode for CM-enhancement-triggered data acquisition. The objective is optimum utilization of the contrast medium bolus in its "plateau" phase in the target anatomic volume. This option has been especially adapted to the increased speed and timing requirements, resulting from the increased speed of modern multi-slice scanners.
The CM enhancement is observed via monitoring scans in a user-defined ROI with one trigger threshold. As soon as the enhancement reaches its predefined threshold, a spiral scan is triggered as quickly as possible.

C.A.R.E. Dose:
Computer driven real-time dose modulation for all scan modes. The dose modulation technique is based on real-time adaptation of the tube current, according to the x-ray attenuation related to the different body region shapes and tissues.

The tube current is automatically adapted .On-the-fly., throughout the whole scan range. For example, asymmetric body regions such as the shoulders and extremities are scanned with varying mA levels as the tube continuously rotates around the patient.

Several clinical and economical benefits are achieved by employing the C.A.R.E. Dose technique:

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Significant dose reduction for all body regions scanned in sequence or spiral mode e.g. average dose reduction of 20% for the head, up to 56% for the shoulder region.

* Enhancement of the image quality and reduction of artifacts for asymmetric body regions such as the shoulders with lower tube current and lower dose requirements.
* Ultra-low dose examinations for pediatric patients.
* Lower power consumption
* Reduced heat load generated in the system and irradiated to the cooling system (lower refrigeration costs)
* Longer spiral ranges and more flexibility for multi-phase examinations (e.g. 3-phase liver), especially for obese patients.

Pediatric Scan Protocols:
Examination protocols specially adapted for the use with pediatric patients. These new scan protocols provide optimum utilization of radiation exposure based on the body region, age and weight of the child being examined. These all-new scan protocols are based on the recommendations and guidelines as published by the FDA in November 2001.

Image Acquisition Modes:

Topogram:
Frontal or lateral survey scan for planning of the examination

* Scanning perspectives: a.p., lat.
* Length of scan field: up to 1,536 mm
* Width of scan field: up to 512 mm
* Up to 9 different anatomic sections can be pre-defined.

Sequential Scan:
Multi-Slice axial scanning technique with incremental table feed.

* Scan field size: 25 cm and 50 cm
* Scan times 500ms, 750ms, 1 and 1.5 seconds for a full 360 degree rotation

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* Slice thicknessess: 0.6, 0.75, 1.0, 1.5, 3, 4.5, 5, 6, 9, 10, 12 mm, direct or with CombiScan as well as automatic scan sequences
* Cycle time as little as 0.75 s

Spiral Scan:
Multi-Slice spiral scanning with continuous table feed for both body and neuro examinations. Examination can be divided into multiple coverage ranges (Multi-Spiral mode) to optimize throughput, resolution and contrast utilization.
* Scan times 500 ms, 750ms, 1s, 1.5s for a full 360 degree rotation
* Maximum uninterrupted scan time of 80 s with full low-contrast resolution
* Maximum uninterrupted spiral length of 157 cm
* Pitch factor freely selectable between 0.5 and 2 (8 to 24) corresponding to a table-feed of 18 to 36mm per 360 degree rotation
* Up to 3 reconstruction jobs can be programmed prospectively
* Up to 180 scan-protocols can be stored

Dynamic-Multi-Scan:
Scanning technique with continuous data acquisition at a single slice location for time-dependent dynamic studies. Quantitative evaluation and graphical display of time-density curves.
* Scan times 500 ms, 750ms, 1s, 1.5s for a full 360 degree rotation
* Up to 100 continuous and uninterrupted sequential scans
* Scans may be controlled from either the main console or via an optional foot switch at the gentry

Serio-Scan:
Scanning technique at a single slice location with variable delay between scans for time-dependent functional studies. Quantitative evaluation and graphical display of time-density curves.
* Scan times 500 ms, 750ms, 1s, 1.5s for a full 360 degree rotation
* Up to 100 continuous and uninterrupted sequential scans

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* Scans may be controlled from either the main console or via an optional foot switch at the gantry

Image Display and Evaluation Modes:

Image Reconstruction:
High performance data processing system for fast image reconstruction and real-time evaluation.

* Archiving, filming and image display of different patients simultaneous with scanning
* Image reconstruction of up to 6 images per second in full matrix
* Simultaneous GuideView image reconstruction in real-time to actual scan (image display in 256 x 256 matrix)
* Continuously variable field-of-view to target anatomy exactly, independent of patient position
* CombiScan technique allows reconstruction of different slice thicknesses from raw data acquired in one single acquisition. For example: lung soft tissue and lung high contrast can be reconstructed using one scan, including suppression of partial volume artifacts.
* Overlapping SPIRAL reconstruction to reduce missed anatomy due to partial volume effects

Image Display:
Simultaneous display, processing and evaluation of images from another patient while the current patient is being scanned.

* 1024 x 1024 display matrix
* Screen splitting configurable from 1 up to 64 image segments
* Standard CT value scale for window setting from -1024 to +3071 HU
* Extended CT value scale for very dense objects from 10,240 to +30,710 HU e.g. to suppress metal artifacts.

CINE Display:
Dynamic presentation technique for the visualization of dynamic processes or volumetric datasets of an entire anatomic region.

* 1024 x 1024 display matrix

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* Series of up to 1024 slices can be displayed
* Variable frame rate of 1-12 f/s with automatic or interactive mouse-operated control
* ECG synchronized viewing available (insertion of ECG signal as reference possible)

Multi Planar Reconstruction (MPR)
Presentation technique providing real-time Multi-Planar Reformatting of additional viewing perspectives (secondary slices) for interactive move through 3D volumes at arbitrary orientations:

* 1024 x 1024 display matrix
* Real-time reconstruction of secondary slices in orthogonal, oblique or double-oblique orientations
* Real-time reconstruction of secondary slices with slice thickness (MPR thick, MPR thin)
* Real-time reconstruction of secondary slices with variable and slice distance
* Real-time reconstruction of curved cuts
* Automatic generation of parallel or radial slice ranges
* Volume of Interest can be determined in the reference topogram, from other MPR or from a 3D surface reconstruction
* Storage of frequently used range settings

CT Angio (CTA):
Presentation technique where pixels with highest intensity (vascular information) are projected onto an arbitrarily oriented plane. This viewing tool is used for the display and diagnosis of vascular information such as vessels, aneurysms, plaques, stenoses, vascular anomalies or vascular origins. Interfering or irrelevant parts of the image can be eliminated with the integrated volume editor. The angular projections are reconstructed around a definable axis, whereby the maximum CT values in this direction are selected for each angular projection. The resulting images can be viewed in the CINE Display mode as a series of images with a 3D image effect. CT Angio uses image reformation techniques such as MinIP or MaxIP (Maximum or Minimum Intensity Projection).

3D Display:

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Presentation technique providing a three-dimensional reformatting capability for a continuous set of transaxial slices. It is used to display and analyze complex anatomies, e.g. of the visceral cranium, pelvis, hips etc., for the purpose of planning surgical interventions. The 3D objects can be tilted and rotated interactively on the monitor and displayed in relation to multi-planar reconstructions (MPR).

Shaded Surface Display (SSD) for surface display of complex anatomies
Presentation technique providing a three-dimensional display of surfaces from a series of contiguous slices using a variable threshold with fast preview and high image quality mode. Used to display and analyze various anatomies, e.g. visceral cranium, pelvis, hips etc., for the purpose of planning surgical interventions. The 3D objects can be tilted and rotated in real-time on the monitor using a virtual trackball. Automatic generation of radial series of SSD displays.

3D-VRT (Volume Rendering Technique):
3D-VRT (Volume Rendering Technique) is a powerful visualization technique for anatomies and their spatial relationships. 3D-VRT provides improved visualization of complex anatomy (heart, renal arteries) difficult to view in axial planes, increased accuracy of orientation among various anatomies (as needed for CT angiography) and large volume data acquisition for diagnosis, e.g. tumor evaluation and surgical planning, and nephrectomy. Interactive viewing from any angle and depth makes VRT the ideal tool for applications such as viewing vessels, pre- and post-surgical evaluation and oncological treatment planning.
VRT includes the following features/benefits:

* Independent control of color, opacity and shading for different tissues, enhancing visualization of neighboring tissues.
* Use of predefined VRT views via a comprehensive organ-based image gallery to minimize manual threshold settings.

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* Region of Interest can be quickly identified by real time navigation through large volumes of data through the use of multiple clipped planes.
* Elimination of bone structures using editing tools, which include manual contouring, thresholding and volume growing, clip boxes and morphological operators Erosion and Dilatation. These functions offer unobstructed viewing of the area of interest.
* For optimal viewing of a specific anatomy of interest, Multi-Planar Reconstruction (MPR), Maximum Intensity Projection (MIP), Surface Shaded Display (SSD) are easily selectable within the VRT application.

As MPR, 3D-Angio, MIP, SSD and 3D-VRT are different visualization techniques based on the same dataset, the user can arbitrarily switch between these modes as well as enlarge the actual display segment. Reconstructed images or ranges can be stored or sent to the film sheet.

Network Module / Network Connectivity / DICOM

DICOM (Digital Imaging and Communications in Medicine, Industry standard) for the transmission of information, between DICOM-compatible units from different manufacturers. The scope of functions is described in detail in the DICOM Conformance Statement and in its standard version includes the Transmission/Reception, Query/Retrieve, Worklist, Storage Commitment and BasicPrint functions.

Scope of functions:
* Unlimited configuration of Network
* Unlimited selection of stations
* Automatic transfer of image data to a DICOM network node
* Connection to local Ethernet network (10 or 100 base T)
* TCP/IP protocol available
* Send and Receive compliant
* Query / Retrieve compliant
* Storage Commitment
* MPPS (Modality Performed Procedure Step).
* Study Pre Registration
* DICOM Print for networked cameras

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Router
Interface to connect the SOMATOM Sensation 16 to the backbone of the Siemens Remote Services. network. This enables the Siemens Uptime Service Center (or local Siemens service location) to connect to the system and proactively monitor it. Siemens Remote Services. guarantees highest availability and fast response in case of a problem. (User responsible for providing telephone line).

Application Training
As part of the purchase of the SOMATOM Sensation 16 Scanner, we offer a comprehensive Application Training Program consisting of the following three modules:

* One four (4) day off-site Application Training for up to 2 CT Technologists at the Siemens Training Center in Cary, North Carolina. This training must be scheduled prior to the installation of the scanner.
* One five (5) day on-site Application Training. This module will be scheduled to coincide with system start-up.
* One three (3) day on-site follow-up Application Training. This module will be scheduled about 6 to 12 weeks after the system start-up.
* ECE Accreditation (ASRT) for completing Applications Training Program.

Scope of off-site training:
* Tuition for 4 days of Application Training at Siemens Training Center in Cary, North Carolina, for up to 2 CT Technologists. A minimum of 1 CT Technologist is required to participate prior to on-site Application Training. Participants are responsible for travel expenses.
* The course is classroom based providing:
* Understanding of Multi-Slice principles and enhanced scan techniques to maximize clinical performance.
* Study parameters enhancing Multi-Slice Image Quality.
* Introduction to Siemens new syngo User Interface and productivity enhanced operation.

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* 24.0 Credits for completion of off-site training program.

Scope of on-site training:
* Includes 5 days clinical CT applications training on-site plus 3 additional days follow-up training, including travel time. Training will be performed during normal business hours and should include weekend and shift personnel.
* Applications training is recommended for three (3) dedicated technologists for the entire training session. Up to five (5) individuals can be accommodated. The trained technologists are responsible for training the remaining staff technologists.
* Siemens recommends that at least one of the dedicated Technologists for on-site training is the technologist that attended the training in Cary, NC.
* Up to 24.0 credits for participation during on-site Application Training.

Note on use of the software:
Use of the entire integrated software including optional software programs is restricted solely to application with this system unit.

1	4418161	KEYBOARD ENGLISH
1	4417916	POWER CABLE
1	4417965	COMPENSATOR TRANSFORMER
1	4464074	UPS FOR NAVIGATOR #SN 16
1	4431479	CT CABINET VZ/VA

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			The CT Cabinet option includes two cabinets to house the Volume Navigator and Volume Wizard computer systems while also offering additional working/storage space making the work area more efficient.	
	1	4437096	**UPS WIZARD 110V**	
	1	4430745	**MOD-DICOM 2.3 GB F.WIZARD CONSOLE VZ/VA**	
			Multifunctional disk storage to allow the digital storage and archiving of image and raw data onto a 2.3 GB, removable, 5-¼ inch MOD in DICOM format.	
			The MOD allows approximately 15,000 images in 256 matrix or 4000 images in 512 matrix to be archived to a single MOD Disk.	
	1	4464041	**COOLING SYSTEM WATER/WATER #SN 16**	
	1	4417908	**HOSE PIPE 30 M**	
	1	4464033	**CABLE SET 24M #SN 16**	
	1	4430935	**CT DESK 1.20 M/BE**	
			CT desk to accommodate the console components and color monitor. Table length is 1.20 meters.	
			CONTRACT TOTAL	996,020.00

FINANCING:

The equipment listed above may be financed through Siemens. Ask us about our full range of financial products that can be tailored to meet your business and cash flow requirements. For further information, please contact your local Sales Representative or the Financial Services Department at 1-800-822-1206.

ACCEPTANCE ON FIRST PAGE INCLUDES ALL FOLLOWING PAGES AS SPECIFIED ABOVE

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Terms and Conditions of Sale

1. GENERAL

1.1 Contract Terms. These terms and conditions constitute an integral part of any offer made by the Seller identified on the first page hereof to sell products ("Products")to Purchaser and shall govern the sale of the Products. Seller shall not be bound by, and specifically objects to, any term, condition or other provisions which are different from or in addition to the provisions of this Agreement (whether or not it would materially alter this Agreement) which is proffered by Purchaser in any purchase order, receipt, acceptance, confirmation, correspondence or otherwise, unless Seller specifically agrees to any such provision in a writing signed by Seller. Products may contain used, reworked or refurbished parts and components that comply with performance and reliability specifications. Purchaser acknowledges that this is a commercial and not a consumer transaction.

1.2 Acceptance. An order shall be binding on Seller only after a credit approval and an order confirmation have been issued by Seller. Acceptance is expressly made conditional on Purchaser's acceptance of these terms and conditions. Purchaser shall be deemed to have assented to, and waived any objection to, this Agreement upon the earliest to occur of any of the following: Purchaser's completion or execution of this Agreement; Purchaser's acceptance of all or any part of the Products subject to this Agreement; Purchaser's failure to object in writing to this Agreement or to cancel its order within ten (10) days of receipt of Seller's confirmation of Purchaser's purchase order; or delivery of the Products to the common carrier for shipment pursuant hereto.

1.3 Third Party Products. If this Agreement includes the sale of third party products not manufactured by Seller, then Purchaser agrees and acknowledges that (a) Purchaser has made the selection on its own, (b) the products are being acquired by Seller solely at the request of and for the benefit of Purchaser, (c) no representation, warranty or guarantee has been made by Seller, and Purchaser will assert no claim against Seller, with respect thereto, (d) the obligation of Purchaser to pay Seller for the products is absolute and unconditional, and (f) Purchaser will look solely to the manufacturer regarding any problems with the products.

2. PRICES

2.1 Quotations. Unless otherwise agreed to in writing or set forth in the quotation, all prices quoted by Seller are based on U.S. dollars F.O.B. Shipping Point, and include standard and customary packaging. Domestic prices apply only to purchasers located in, and who will use the Products in, the U.S. International prices apply to all purchasers located outside of, or who will use or ship or facilitate shipment of the Products outside of, the U.S. Unless otherwise stated, the quotation shall only be valid for forty-five (45) days from the date of the quotation.

2.2 Delay in Acceptance of Delivery. Should the agreed delivery date be postponed by Purchaser, Seller shall have the right to deliver to storage at Purchaser's risk and expense, and payments due upon delivery shall become due when Seller is ready to deliver.

2.3 Escalation. Unless otherwise agreed to in writing, except as to goods to be delivered within six (6) months of Seller's acceptance of Purchaser's order, Seller reserves the right to increase its prices to those in effect at the time of shipment.

3. TAXES

3.1 Any sales, use or manufacturer's tax which may be imposed upon the sale or use of Products, or any property tax levied after readiness to ship, or any excise tax, license or similar fee required under this transaction, shall be in addition to the quoted prices and shall be paid by Purchaser.

4. TERMS OF PAYMENT

4.1 Due Date. Unless otherwise set forth in the quotation, Seller's payment terms are as follows: an initial deposit of 10% of the purchase price for each Product is due upon submission of the purchase order, an additional 80% of the purchase price is due upon delivery of each Product, and the final 10% of the purchase price is due upon completion of installation. Unless otherwise agreed, all payments other than the initial deposit are due net thirty (30) days from the date of invoice. All amounts payable pursuant to this Agreement are denominated in United States dollars, and Purchaser shall pay all such amounts in lawful money of the United States. Partial shipments shall be billed as made, and payments for such shipments will be made in accordance with the foregoing payment terms.

4.2 Late Payment. A service charge of 1½% per month, not to exceed the maximum rate allowed by law, shall be made on any portion of Purchaser's outstanding balance which is not paid within thirty(30) days after invoice date, which charge shall be determined and compounded on a daily basis from the due date until the date paid. Payment of such service charge shall not excuse or cure Purchaser's breach or default for late payment. In addition, in the event that Purchaser fails to make any payment to Seller within this thirty (30) day period, including but not limited to any payment under any service contract, promissory note or other agreement with Seller, then Seller shall have no obligation to continue performance under any agreement with Purchaser.

4.3 Payment of Lesser Amount. If Purchaser pays, or Seller otherwise receives, a lesser amount than the full amount provided for under this Agreement, such payment or receipt shall not constitute or be construed other than as on account of the earliest amount due Seller. Seller may accept any check or payment in any amount without prejudice to Seller's right to recover the balance of the amount due or pursue any other right or remedy. No endorsement or statement on any check or payment or in any letter accompanying a check or payment or elsewhere shall constitute or be construed as an accord or satisfaction.

4.4 Where Payment Upon Installation or Completion. Should any special terms of payment provide for either full or partial payment upon installation or completion of installation or thereafter, and the installation or completion is delayed for any reason for which Seller is not responsible, the Products shall be deemed installed upon delivery and, if no other terms were agreed upon in writing signed by the parties, the balance of payments shall be due no later than thirty (30) days from delivery regardless of the actual installation date.

4.5 Failure of Purchaser to Pay. At Seller's election upon Purchaser's failure to pay when due any amount required to be paid to Seller under this Agreement (a) the entire amount of any indebtedness and obligation due Seller under this Agreement and interest thereon shall become immediately due and payable without notice, demand, or period of grace; (b) Purchaser shall put Seller in possession of the Products upon demand; (c) Seller may enter any premises where the Products are located and take possession of the Products without notice or demand and without legal proceedings; (d) at the request of Seller, Purchaser shall assemble the Products and make them available to Seller at a place designated by Seller which is reasonable and convenient to all parties; (e) Seller may sell or otherwise dispose of all or any part of the Products and apply the proceeds thereof against any indebtedness or obligation of Purchaser under this Agreement (Purchaser agrees that a period of 10 days from the time notice is sent to Purchaser shall be a reasonable period of notification of sale or other disposition of the Products by or for Seller); (f) if this Agreement or any indebtedness or obligation of Purchaser under this Agreement is referred to an attorney for collection or realization, Purchaser shall pay to Seller all costs of collection and realization (including, without limitation, a reasonable sum for attorneys fees, expenses of title search, all court costs and other legal expenses) incurred thereby; and (g) Purchaser shall pay any deficiency remaining after collection of or realization by Seller on the Products.

5. EXPORT TERMS

5.1 Unless other arrangements have been made, payment on export orders shall be made by irrevocable confirmed letter of credit, payable in U.S. dollars against Seller's invoice and standard shipping documents. Such letter of credit shall be in an amount equal to the full purchase price of the Products and shall be established in a U.S. bank acceptable to Seller. Purchaser shall procure all necessary permits and licenses for shipment and compliance with any governmental regulations concerning control of final destination of Products.

5.2 Purchaser shall not, directly or indirectly, violate any U.S. law, regulation or treaty, or any other international treaty or agreement, relating to the export or reexport of any Product or associated technical data, to which the U.S. adheres or with which the U.S. complies. Purchaser shall defend, indemnify and hold Seller harmless from any claim, damage, liability or expense (including but not limited to reasonable attorneys fees) arising out of or in connection with any violation of the preceding sentence. If Purchaser purchases a Product at the domestic price and exports such Product, or transfers such Product to a third party for export, outside of the U.S., Purchaser shall pay to Seller the difference between the domestic price and the international retail price of such Product pursuant to the payment terms set forth herein. Purchaser shall deliver to Seller, upon Seller's request, written assurances regarding compliance with this section in form and content acceptable to Seller.

6. DELIVERY, RISK OF LOSS

6.1 Delivery Date. Delivery and completion schedules are approximate only and are based on conditions at the time of acceptance of Purchaser's order by Seller. Seller shall make every reasonable effort to meet the delivery date(s) quoted or acknowledged, but shall not be liable for any failure to meet such date(s). Partial shipments may be made.

6.2 Risk of Loss, Title. Unless otherwise agreed to in writing, delivery shall be complete upon transfer of possession to common carrier, F.O.B. Shipping Point, whereupon title to and all risk of loss, damage to or destruction of the Products shall pass to Purchaser. All freight charges and other transportation, packing and insurance costs, license fees, customer duties and other similar charges shall be the sole responsibility of the Purchaser unless otherwise agreed to in writing by Seller. In the event of any loss or damage to any of the Products during shipment, Purchaser should make claim against the carrier.

7. SECURITY INTEREST/FILING

7.1 Seller shall have a purchase money security interest in the Products (and all accessories and replacements thereto and all proceeds thereof) until payment in full by Purchaser and satisfaction of all other obligations of Purchaser hereunder. Purchaser authorizes Seller to file (and Purchaser shall promptly execute, if requested by Seller) and (ii) irrevocably appoints Seller its agent and attorney-in-fact to execute in the name of Purchaser and file, with such authorities and at such locations as Seller may deem appropriate, any Uniform Commercial Code financing statements with respect to the Products and/or this Agreement. Purchaser also agrees that an original or a photocopy of this Agreement (including any addenda, attachments and amendments hereto) may be filed by Seller as a Uniform Commercial Code financing statement. Purchaser further represents and covenants that (a) it will keep the Products in good order and repair until the purchase price has been paid in full, (b) it will promptly pay all taxes and assessments upon the Products or the use thereof, (c) it will not attempt to transfer any interest in the Products until the purchase price has been paid in full, and (d) it is solvent and financially capable of paying the full purchase price for the Products.

8. CHANGES, CANCELLATION, AND RETURN

8.1 Orders accepted by Seller are not subject to change except upon written agreement.

8.2 Orders accepted by Seller are non-cancellable by Purchaser except upon Seller's written consent and payment by Purchaser of Seller's reasonable cancellation charges not to exceed 25% of the price of the affected Products, plus any shipping, insurance, inspection and refurbishment charges. In no event can an order be cancelled by Purchaser or Products be returned to Seller after shipment has been made.

8.3 Seller shall have the right to change the manufacture and/or design of its Products if, in the judgment of Seller, such change does not alter the general function of the Products.

9. FORCE MAJEURE

9.1 Seller will make every effort to complete shipment, and installation where indicated, but shall not be liable for any loss or damage for delay in delivery, inability to install or any other failure to perform due to causes beyond its reasonable control including, but not limited to, acts of government or compliance with any governmental rules or regulations, acts of God or the public, war, civil commotion, blockades, embargoes, calamities, floods, fires, earthquakes, explosions, storms, strikes, lockouts, labor disputes, or unavailability of labor, raw materials, power or supplies. Should such a delay occur, Seller may reasonably extend delivery or production schedules or, at its option, cancel the order in whole or part without liability other than to return any unearned deposit or prepayment.

10. WARRANTY

10.1 Seller warrants that the Products manufactured by Seller and sold hereunder shall be free from defects in material or workmanship under normal use and service for the period set forth in the quotation or in a separate Warranty Statement covering the Products to be provided by Seller. Unless otherwise set forth in the quotation, the warranty period shall commence on the date that the Products have been installed in accordance with 12.6 hereof, which date shall be confirmed in writing by Seller. Seller makes no warranty for any Products made by persons other than Seller or its affiliates, and Purchaser's sole warranty therefore, if any, is the original manufacturer's warranty, which Seller agrees to pass on to Purchaser, as applicable.

10.2 No warranty extended by Seller shall apply to any Products which have been damaged by accident, misuse,

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abuse, negligence, improper application or alteration or by a force majeure occurrence as described in Section 9 hereof or by the Purchaser's failure to operate the Equipment in accordance with the manufacturer's instructions or to maintain the recommended operating environment and line conditions, which are defective due to unauthorized attempts to repair, relocate, maintain, service, add to or modify the Equipment by the Purchaser or any third party or due to the attachment and/or use of non-Seller supplied equipment without Seller's prior written approval; which failed due to causes from within non-Seller supplied equipment which have been damaged from the use of operating supplies or consumable parts not approved by Seller. In addition, no warranty extended by Seller shall apply to any transducer failure due to events such as cracking from high impact drops, cable rupture from rolling equipment over the cable, or delamination from cleaning with inappropriate solutions. Seller's obligation under this warranty is limited to the repair or replacement, at Seller's option, of defective parts.Seller may effectuate such repair at Purchaser's facility, and Purchaser shall furnish Seller safe and sufficient access for such repair. Repair or replacement may be with parts or products that are new, used or refurbished. Repairs or replacements shall not interrupt, extend or prolong the term of the warranty. Buyer shall, upon Seller's request, return the noncomplying Product or part to Seller with all transportation charges prepaid, but shall not return any Product or part to Seller without Seller's prior written authorization. Buyer shall pay Seller its normal charges for service and parts for any inspection, repair or replacement that is not, in Seller's sole judgement, required by noncompliance with the warranty set forth in Section 10.1. Seller's warranty does not apply to consumable materials, except as specifically stated in writing, nor to products or parts thereof supplied by Purchaser.

10.3 This warranty is made on condition that immediate written notice of any noncompliance be given to Seller and Seller's inspection reveals that the Purchaser's claim is valid under the terms of the warranty (i.e., that the noncompliance is due to traceable defect in original materials and/or workmanship).

10.4 Warranty service will be provided without charge during Seller's regular working hours (8:30-5:00), Monday through Friday, except Seller's recognized holidays. If Purchaser requires that service be performed other than during these times, such service can be made available at an additional charge, at Seller's then current rates.

SELLER MAKES NO WARRANTY OTHER THAN THE ONE SET FORTH HEREIN OR THAT WHICH MAY BE PROVIDED IN A SEPARATE WARRANTY COVERING THE APPLICABLE PRODUCT CATEGORY. SUCH WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSES, AND SUCH CONSTITUTES THE ONLY WARRANTY MADE WITH RESPECT TO THE PRODUCTS AND ANY DEFECT, DEFICIENCY OR NONCONFORMITY IN ANY PRODUCT, SERVICE OR OTHER ITEM FURNISHED UNDER THIS AGREEMENT.

11. LIMITATION OF LIABILITY

11.1 In no event shall Seller's liability hereunder exceed the actual loss or damage sustained by Purchaser, up to the purchase price of the Products.

11.2 SELLER SHALL NOT BE LIABLE FOR ANY LOSS OF USE, REVENUE OR ANTICIPATED PROFITS, LOSS OF STORED, TRANSMITTED OR RECORDED DATA, OR FOR ANY INCIDENTAL, UNFORESEEN, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR THE SALE OR USE OF THE PRODUCTS. This provision does not affect third party claims for personal injury arising as a result of Seller's negligence or product defect. THE FORGOING IS A SEPARATE, ESSENTIAL TERM OF THIS AGREEMENT AND SHALL BE EFFECTIVE UPON THE FAILURE OF ANY REMEDY, EXCLUSIVE OR NOT.

12. INSTALLATION - ADDITIONAL CHARGES

12.1 General. Unless otherwise expressly stipulated in writing, the Products covered hereby shall be installed by and at the expense of Seller except for rigging charges which shall be the responsibility of Purchaser.

12.2 Installation by Seller. If Seller specifies it will install the Products, the following applies: subject to fulfillment of the obligations set forth in 12.4 below, Seller shall install the Products covered hereby and connect same to the requisite safety switches and power lines to be installed by Purchaser.

Except as otherwise specified below, if such installation and connection are performed by Seller's technical personnel, prices shown include the cost thereof, provided that the installation and connection can be performed within the Continental United States or Puerto Rico and during normal business hours. Any overtime charges or other special expenses shall be additional charges to the prices shown.

12.3 Trade Unions. If a trade union, or unions, prevents Seller from performing the above work, the Purchaser shall make all required arrangements with the trade union, or unions, to permit Seller completion of said work. Moreover, any additional cost related to such labor disputes shall be paid by the Purchaser and Seller's obligations under such circumstances will be limited to providing engineering supervision of installation and connection of Seller equipment to existing wiring.

12.4 Purchaser's Obligations. Purchaser shall, at its expense, provide all proper and necessary labor and materials for plumbing service, carpentry work, conduit wiring, and other preparations required for such installation and connection. All such labor and materials shall be completed and available at the time of delivery of the Products by Seller. Additionally, the Purchaser shall provide free access to the premises of installation and, if necessary, safe and secure space thereon for storage of Products and equipment prior to installation by Seller. If any special work of any type must be performed in order to comply with requirements of any governmental authority, including procurement of special certificates, permits and approvals, the same shall be performed or procured by Purchaser at Purchaser's expense. Purchaser shall provide a suitable environment for the Products and shall ensure, at its sole cost and expense, that its premises are free of asbestos, hazardous conditions and any concealed dangerous conditions and that all site requirements are met. In the event that Seller is requested to supervise the installation of the Products, it remains the Purchaser's responsibility to comply with local regulations. Seller is not an architect and all drawings furnished by Seller are not construction drawings.

12.5 Regulatory Reporting. In the event that any regulatory activity is performed by other than Seller authorized personnel, Purchaser shall be responsible for fulfilling any and all reporting requirements. Seller shall only report activity performed by its authorized personnel.

12.6 Completion of Installation. Installation shall be complete upon the conclusion of final calibration and checkout under Seller standard procedures to verify that the Products meet applicable written performance specifications. Notwithstanding the foregoing, first use of the Products by Purchaser, its agents or employees for any purpose after delivery shall constitute completion of installation.

13. PATENT, TRADEMARK AND OTHER INFRINGEMENT CLAIMS

13.1 Infringement by Seller. Seller warrants that the Products manufactured by Seller and sold hereunder do not infringe any U.S. patent or copyright. If Purchaser receives a claim that any such Product, or parts thereof, infringe upon the rights of others under any U.S. patent or copyright, Purchaser shall notify Seller immediately in writing. As to all infringement claims relating to Products or parts manufactured by Seller or one of its affiliates:

(a) Purchaser shall give Seller information, assistance and exclusive authority to evaluate, defend and settle such claims.

(b) Seller shall then, at its own expense, defend or settle such claims, procure for the Purchaser the right to use the Products, or remove or modify them to avoid infringement. If none of these alternatives is available on terms reasonable to Seller, then Purchaser shall return the Products to Seller and Seller shall refund to Purchaser the purchase price paid by the Purchaser less reasonable depreciation for Purchaser's use of the Products.

13.2 Infringement by Purchaser. If some or all of the Products sold hereunder are made by Seller pursuant to drawings or specifications furnished by the Purchaser, or if Purchaser modifies or combines, operates or uses the Products other than as specified by Seller or with any product, data, software, apparatus or program not provided or approved by Seller, then the indemnity obligation of Seller under Section 13.1 shall be null and void and should a claim be made that such Products infringe the rights of any third party under patent, trademark or otherwise, then Purchaser shall indemnify and hold Seller harmless against any liability or expense, including reasonable attorneys' fees, incurred by Seller in connection therewith.

14. DESIGNS AND TRADE SECRETS/LICENSE

14.1 Any drawings, data, designs, software programs or other technical information supplied by Seller to Purchaser in connection with the sale of the Products are not included in the sale of the Products to Purchaser, shall remain Seller's property and shall at all times be held in confidence by Purchaser. Such information shall not be reproduced or disclosed to others without Seller's prior written consent.

14.2 For all goods purchased hereunder which utilize software for their operation, such 'Applications Software' shall be licensed to Purchaser under the terms of Seller's Software License Schedule as attached hereto.

14.3 Diagnostic/Maintenance Software is not included under 14.2 above, is available only as a special option under a separate Diagnostic Materials License Agreement and may be subject to a separate licensing fee.

ENGINEERING CHANGES

15.1 Seller makes no representation that engineering changes which may be announced in the future will be suitable for use on, or in connection with, the Products.

16. ASSIGNMENT

16.1 Neither party may assign any rights or obligations under this Agreement without the written consent of the other and any attempt to do so shall be void, except that Seller may assign this Agreement without consent to any subsidiary or affiliated company. This Agreement shall inure to and be binding upon the parties and their respective successors, permitted assigns and legal representatives.

17. DAMAGES, COSTS AND FEES

17.1 In the event that any dispute or difference is brought arising from or relating to this Agreement or the breach, termination or validity thereof, the prevailing party shall NOT be entitled to recover from the other party any punitive damages. The prevailing party shall be entitled to recover from the other party all reasonable attorneys fees incurred, together with such other expenses, costs and disbursements as may be allowed by law.

18. MODIFICATION

18.1 This Agreement may not be changed, modified or amended except in writing signed by duly authorized representatives of the parties.

19. GOVERNING LAW

19.1 This Agreement shall be governed by the laws of the State of New Jersey.

20. INTEGRATION

20.1 These terms and conditions, including any attachments or other documents incorporated by reference herein, constitute the entire agreement and the complete and exclusive statement of agreement with respect to the subject matter hereof, and supersede any and all prior agreements, understandings and communications between the parties with respect to the Products.

21. SEVERABILITY; HEADINGS

21.1 No provision of this Agreement which may be deemed unenforceable will in any way invalidate any other portion or provision of this Agreement. Section headings are for convenience only and will have no substantive effect.

22. WAIVER

22.1 No failure and no delay in exercising, on the part of any party, any right under this Agreement will operate as a waiver thereof, nor will any single or partial exercise of any right preclude the further exercise of any other right.

23. NOTICES

23.1 Any notice or other communication under this Agreement shall be deemed properly given if given in writing and delivered in person or mailed, properly addressed and stamped with the required postage, to the intended recipient at its address specified on the face hereof. Either party may from time to time change such address by giving the other party notice of such change in accordance with this section.

24. RIGHTS CUMULATIVE

24.1 The rights and remedies afforded to Seller under this Agreement are in addition to, and do not in anyway limit, any other rights or remedies afforded to Seller by any other agreement, by law or otherwise.

25. END USER CERTIFICATION

25.1 Purchaser represents, warrants and covenants that it is acquiring the Products for its own end use and not for reselling, leasing or transferring to a third party (except for lease-back financings).

01/02 Rev

ACCEPTANCE ON FIRST PAGE INCLUDES ALL FOLLOWING PAGES AS SPECIFIED ABOVE

Siemens Medical Solutions USA, Inc.
UNC HOSPITALS

QUOTE REFERENCE
Number : 10094707 Date : 03/12/2002

101 MANNING DRIVE
CHAPEL HILL NC 27514

Software License Schedule To The Siemens Medical Solutions USA, Inc. Terms And Conditions Of Sale

1. DEFINITIONS: The following definitions apply to this Schedule:

"Agreement" shall mean the attached Quotation for Products and/or Services including the Terms and Conditions of Sale and applicable schedules.

"Licensor" shall mean the seller of the Products and/or Services listed on the attached Quotation.

"Licensee" shall mean the end-user to whom Licensor provides Software or Documentation for internal use under the Agreement.

"Software" shall mean (i) software programs consisting of a series of statements or instructions to be used directly or indirectly in a programmable controller or computer to bring about a certain result and (ii) databases consisting of systematized collections of data to be used or referenced directly or indirectly by a programmed controller or computer. Notwithstanding the foregoing, "Software" does not include "firmware" as such term is conventionally understood.

"Documentation" shall mean the documents and other supporting materials which are intended to support the use of an associated product, including (but not limited to) instructions, descriptions, flow charts, logic diagrams and listings of the Software, in text or graphic form, on machine readable or printed media.

"Designated Unit" shall mean a single central unit or computer identified in the Agreement on which Software licensed hereunder may be used by Licensee.

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Revised 01/02

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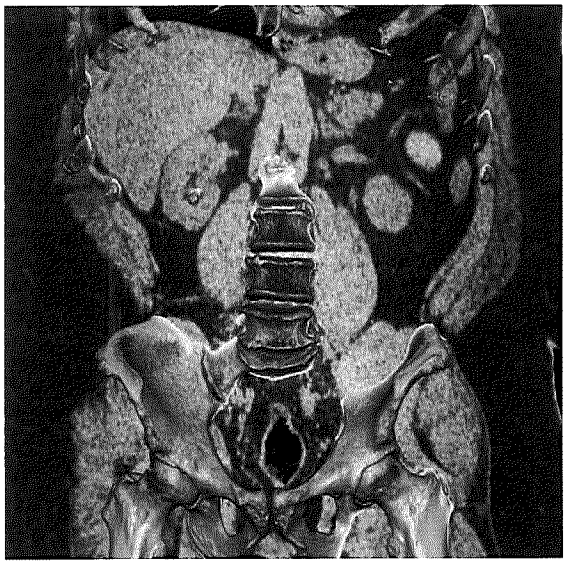
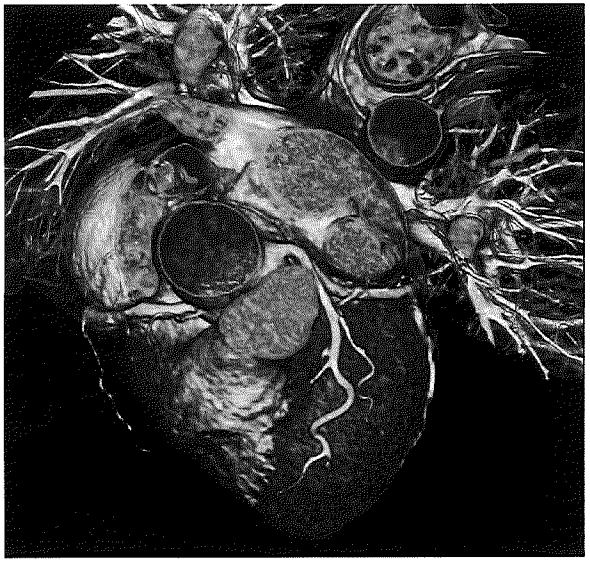
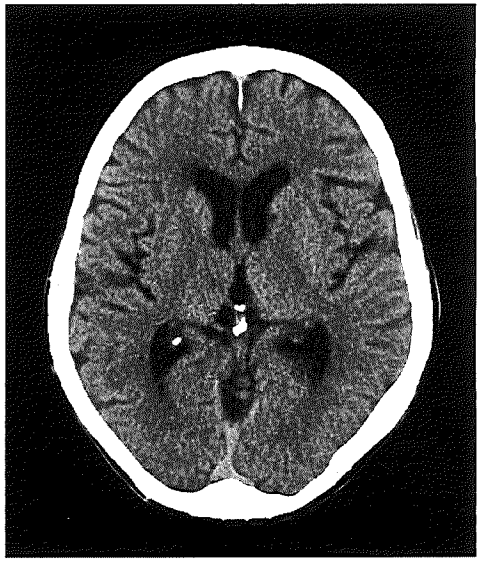
Exhibit 3


SIEMENS
SOMATOM

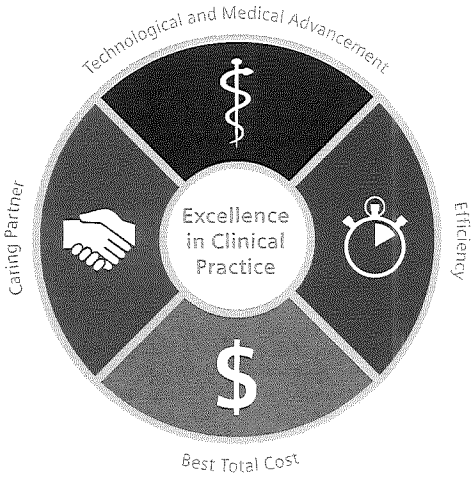
SOMATOM Definition AS







Siemens CT Vision



Today's reality

Better healthcare for all patients is a key priority for the entire medical industry. But the realities of clinical practice often make this simple-to-understand goal quite difficult to realize: staying within budgets, reducing hospital stays, speeding up time to diagnosis, and dealing with personnel issues, while maintaining high clinical standards and throughput. At the same time, patients demand better and faster results.

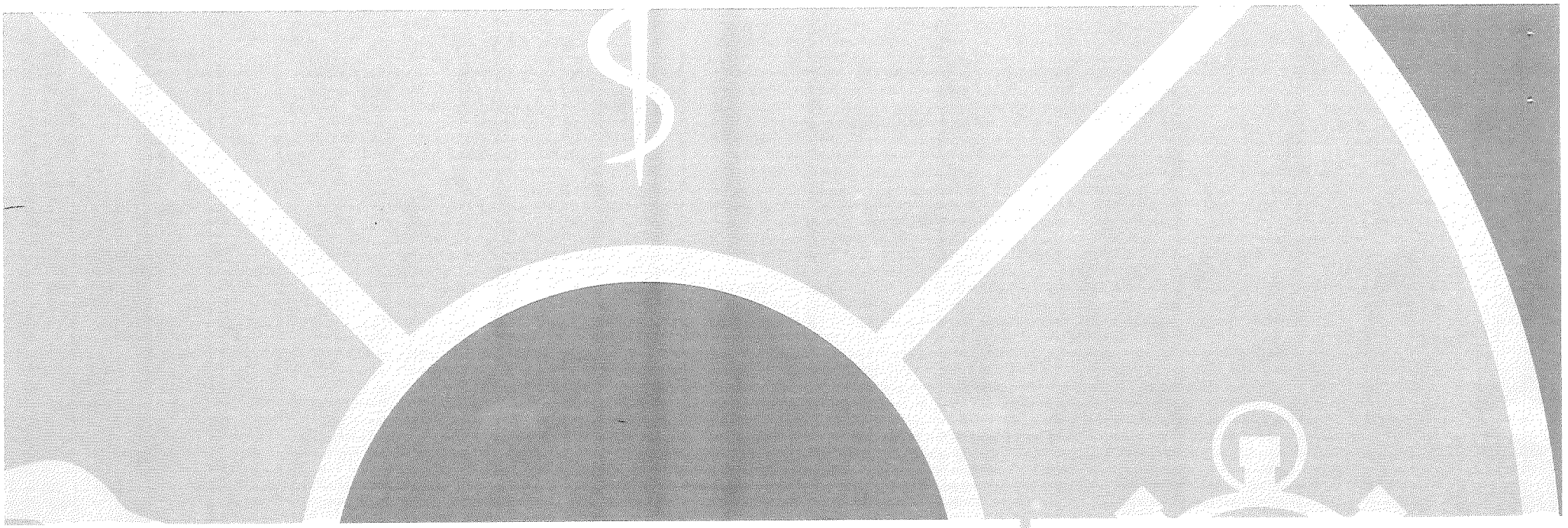
Our approach

In order to meet our share of responsibility in addressing these challenges, Siemens, from the earliest stages of research, product development, and design, relies upon the advice and recommendations of external medical experts to determine our focus – and this focus has been on the needs and demands of our end users. Over the years, this focus has been fine-tuned in four key areas:

- to lead technological and medical advancement
- to maximize workflow efficiency
- to make state-of-the-art CT affordable
- to set the standard in customer care.

Our vision

As customer-oriented healthcare provider, Siemens CT creates CT innovations that lift clinical practice to the next level of excellence and enable wide access to better patient care. We believe that even the farthest technical horizons are



temporary and can be surpassed with consistent dedication to improved healthcare. This visionary approach, backed up by the far largest Siemens R&D budget in the healthcare industry, has made Siemens the acknowledged innovation leader over the last decades. And our ambitious global team continues to set the trend in an always changing environment, providing Answers for Life.

Leading patient care

More than one thousand institutions worldwide have already decided to bring patient care to a new level by utilizing the fascinating capabilities of the SOMATOM® Definition AS. Minimizing patient exposure in every scan, plus offering new dimensions in CT imaging brings them to the forefront of patient care.

Patient-centric productivity

Fueled by the new and unique features of FAST CARE, the new SOMATOM Definition AS now lets customers unleash the full potential of their resources. Imagine a CT system that assists you in every step of the examination from planning to scanning and from reconstructing to evaluating images. Thus giving you significantly more time for what is actually of utmost importance: delivering a precise diagnosis and having the time to interact and take care of your patients. Now for the first time, outstanding image quality acquired at drastically reduced radiation dose is combined with unmatched clinical productivity delivering a new dimension in clinical efficiency and patient care. We call it: patient-centric productivity.

SOMATOM Definition AS

Maximize outcome

Over the recent years Computed Tomography has found its way into almost every clinical discipline. Especially with the first generation of the SOMATOM Definition AS from 2007, Siemens introduced a scanner that for the first time was capable of adapting to virtually every patient and every clinical question. But with CT not being a trivial examination, it was only natural that the introduction of CT for new medical fields came along with high requirements regarding efforts and expertise of the medical professionals preparing an examination. Unfortunately, the time and resources needed for the preparation are then not available anymore for diagnosis and patient consultations, which in the end should be the main focus for physicists, technical assistants and all medical professionals involved.

Now Siemens is again breaking this barrier: With the new SOMATOM Definition AS with FAST CARE you have the possibility to maximize your clinical outcome – meaning to have best clinical results, but with significantly less resources bound to the CT system. The ultimate goal is to provide you with more time for patients – or patient-centric productivity.

For this Siemens introduced its new FAST (Fully Assisting Scanner Technologies) research and development philosophy. These new FAST features available on the new SOMATOM Definition AS allow to simplify typically time consuming and complex procedures during a CT examination: the scanning process gets more intuitive and the results become more reproducible. By integrating the capabilities of *syngo*.via*, the complete examination – from scan preparation to data evaluation – is streamlined towards a more reliable diagnosis with less patient burden. Ultimately, the combination of outstanding image quality and patient-centric productivity is the lever to maximize your clinical outcome.

**syngo*.via can be used as a standalone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own rights.

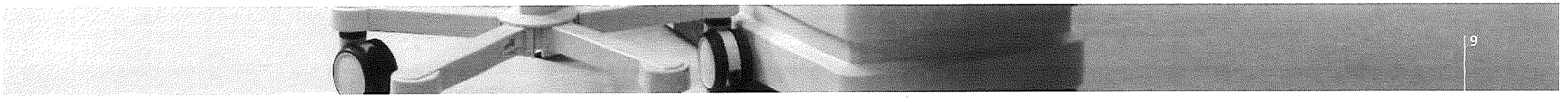
Minimize dose

From the very beginning, one of the most important topics for Siemens CT has been patient safety. And in Computed Tomography, patient safety translates primarily into dose reduction. This is why since decades, Siemens has always been at the forefront to reduce radiation dose to the lowest possible level.

Siemens has developed many significant products and protocols that follow the "As Low as Reasonably Achievable" (ALARA) principle to reduce radiation dose to the lowest possible level. This desire for as little radiation exposure as possible lies at the heart of our CARE (Combined Applications to Reduce Exposure) research and development philosophy. Over the years, Siemens has been highly successful in integrating many innovations into the Siemens scanners that significantly reduce radiation dose in comparison to other systems available on the CT market. For example, the Adaptive Dose Shield, introduced with the first SOMATOM Definition AS in 2007, or IRIS – Iterative Reconstruction in Image Space – in 2009, with the capability to reduce dose up to 60% without loss in image quality*.

With the new SOMATOM Definition AS with FAST CARE, Siemens again introduces several innovative CARE features like CARE kV – industry's first automated exam-specific kV setting – or the first raw-data-based iterative reconstruction SAFIRE (Sinogram Affirmed Iterative Reconstruction). To give our customers every means to minimize dose and consequently take best care of their patients well-being.

*In clinical practice, the use of IRIS may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a up to 60% dose reduction when using the IRIS reconstruction software. Noise, CT numbers, homogenity, low-contrast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.



Single-Click Readiness

Every CT examination poses individual and specific requirements to achieve the optimum clinical outcome. These vary from institution to institution, from user to user, from patient to patient. The challenge is to find and apply the ideal settings for every individual examination, but at the same time achieve a high degree of reproducibility for the same type of examination when done by different operators.

The new SOMATOM Definition AS with FAST CARE now introduces Siemens' unique FAST (Fully Assisting Scanner Technologies) research and development philosophy to solve this. By automatically suggesting the best set of parameters for every individual examination based on the selected body region, the scan and recon planning becomes as fast as just a single click.

Introduction
Single-Click Readiness

FAST – Fully Assisting Scanner Technologies

Utilizing FAST innovations, typically time-consuming and complex procedures during the scan process are extremely simplified and automated, not only improving workflow efficiency, but optimizing the overall clinical outcome by creating reproducible results. This makes diagnosis more reliable and reduces patient burden through streamlined examinations.

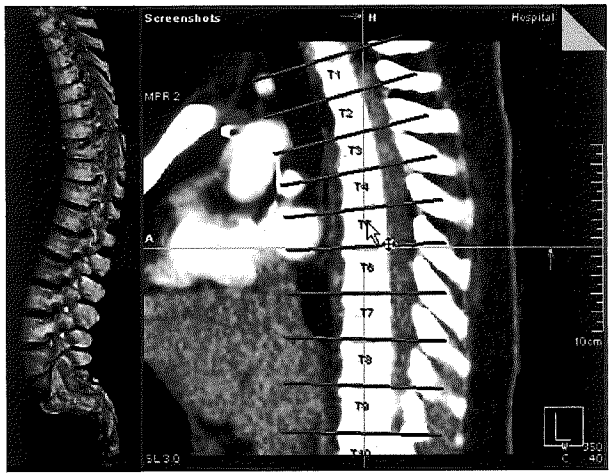
Efficient scan and recon planning

Regardless whether you are about to scan, reconstruct or evaluate an image, the right settings are always determined by the organ to be examined. Based on the respective organ, the examination type and the expected image quality, indepth knowledge of the system settings is required from the operator. This becomes even more crucial, when the results need to be reproducible, especially when the system is being operated by multiple users. Unfortunately, this complexity can become a source for inefficiency or, even worse, errors.

The SOMATOM Definition AS with FAST CARE is now the first single source CT scanner that actively assists you in solving this challenge: FAST Planning prepares your scan and recon settings based on the characteristics of the chosen organ. This not only reduces the efforts needed to set up an examination, but makes them highly reproducible and less error-prone. Especially the highly time-consuming preparation of a spine recon, is simplified to ideally just a single click with FAST Spine. At the end of the day, the new SOMATOM Definition AS with FAST CARE helps you to save your highly valuable time and allows you to spend it more for the diagnosis and the interaction with your patients.

Focus on the examination, not on the system

But it is not only about choosing the appropriate scan and recon range. Also setting the right system parameters like scan time, pitch or tube current is crucial



Anatomically correct spine reconstructions are typically very time consuming procedures, as every spinal vertebrae and disc needs to have an own recon layer depending on its individual position. With FAST Spine, these manual steps can be simplified to ideally just a single click.

to achieve best clinical results. Unfortunately, this is not always trivial and especially when working in high-demanding environments like in an ED, time is of the essence.

For this, the new SOMATOM Definition AS with FAST CARE now offers an amazing solution: FAST Adjust. With an easy to understand and easy to use interface parameters can be simply adjusted or, when in doubt, defined just with the push of a button.

Guided routine in cardiac CT

One of the most sophisticated and demanding examinations in Computed Tomography is cardiac CT. Not only the preparations for the scan demand a high degree of expertise, but also how to prepare the image evaluation is everything else than trivial. All the more it is important that the user, feels safe to have done everything correctly in order to achieve the best clinical outcome possible and to avoid any unnecessary radiation of the patient. Therefore, the new SOMATOM Definition AS with FAST CARE introduces the first guided routine in cardiac CT – the FAST Cardio Wizard. It explains on a step-by-step basis how to achieve an optimal cardiac scan, either for training purposes or in a real-life situation, thus helping to set institutional standards and uniform quality.

Fully integrated pre- and postprocessing

And cardiac CT does not end with the acquisition of image data. Especially post-processing of cardiac datasets was up to now a highly complex procedure consisting of many manual steps, from removing the table or the isolation of the heart to labeling the vessels and calculating all functional parameters appropriately.

With the utilization of *syngo*.via, this can be reduced to just one single click: Simply choose your patient. All required steps are already pre-processed by *syngo*.via* so that the reading physician can immediately start with the evaluation of the case.

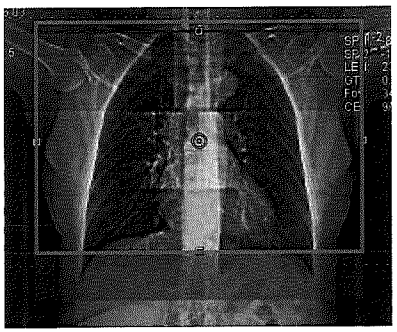
**syngo*.via can be used as a standalone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own rights.

Your Benefits

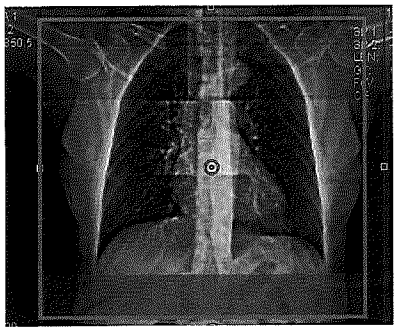
- Immediate, organ-based scan and recon range setting with FAST Planning
- Higher reliability and reproducibility in cardiac CT with the FAST Cardio Wizard
- FAST Adjust allows intuitive scan parameter adjustment with the push of a button
- Precise spine recon preparation with just a single click with FAST Spine
- Image evaluation with a single click Through *syngo*.via

How it works
FAST Planning

without FAST Planning



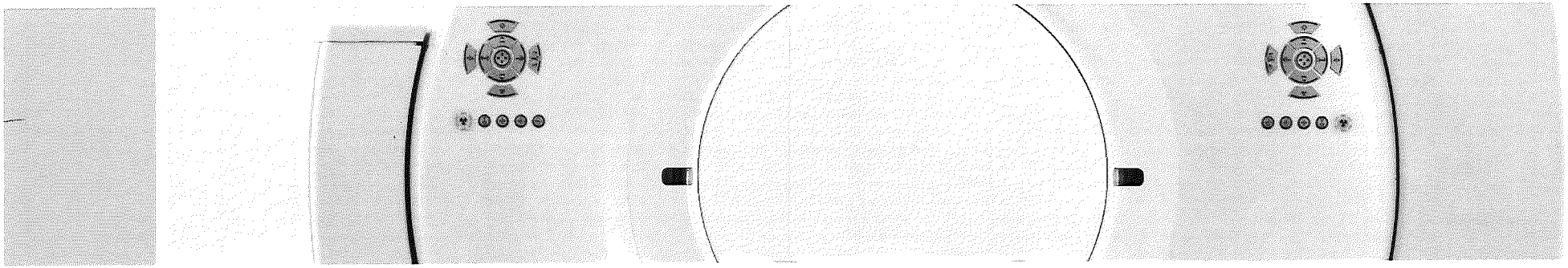
Manually setting the scan range too short in the topogram can cut off relevant parts of the examined organ.



Manually setting the scan range too long in the topogram can potentially over-radiate the patient.

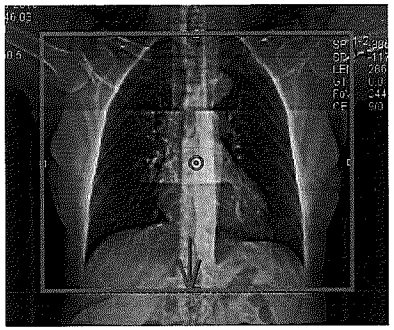
Simplify organ-specific planning

Unfortunately, with conventional planning procedures, errors can happen quickly. Especially when time is short, the wrong scan mode might be chosen, the scan ranges could be set too short or too long or the selected protocol was meant for another organ. This can only be countered by investing an increased amount of attention (i.e. time) and expertise to thoroughly prepare the scan.

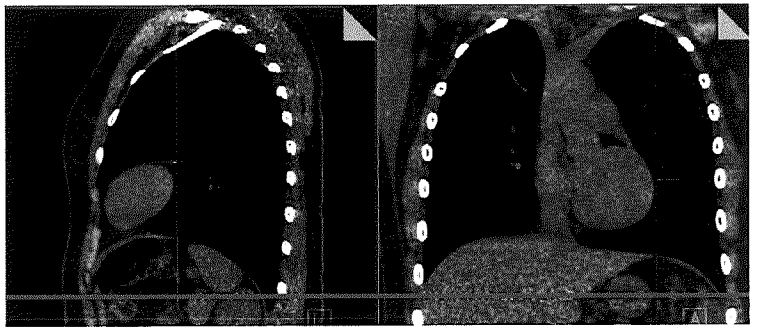


FAST Planning focuses explicitly on this critical part of the scan process. Based on the topogram, FAST Planning assists the scan and reconstruction planning to provide an easier, faster and standardized workflow in CT scanning. The user can select the anatomical region of interest (ROI) from a list to define prospectively the scan and reconstruction ranges. The scan ROI(s) are automatically detected based on the characteristics of the organ that is to be scanned. In addition, the corresponding scan range(s) are proposed in the topogram as well. If needed, the lateral field of view can easily be narrowed or widened. In the case of head examinations, the iso-center is automatically adapted according to the position of the patient's head.

with FAST Planning



Scan ranges can be set with just a single click using FAST Planning. FAST Planning also helps assure covering the entire organ precisely without overscanning.

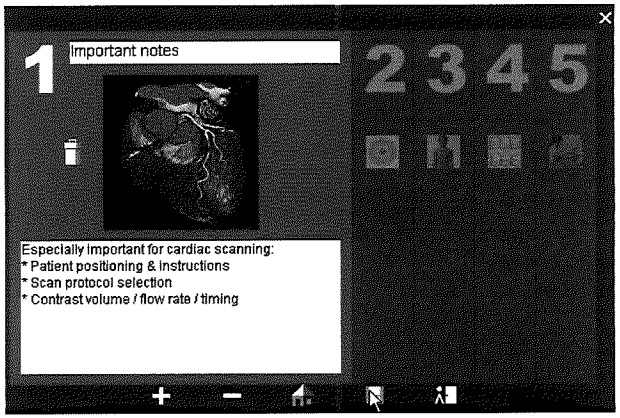


FAST Planning uses defined anatomical landmarks to set the correct ranges. When applied manually without FAST Planning, only based on the coronal view the lower part of the lung could easily be missed (indicated by the reference line).

How it works
FAST Cardio Wizard

Step-by-step cardiac exam

Among the most complex examinations are cardiac scans. A lot of parameters and settings have to be taken into account and precisely matched to the individual condition of the patient. Consequently, the procedure to set up the scan is highly complex and requires a lot of expertise. Here the FAST Cardio Wizard is an amazing assistant: It is an intuitive guidance, fully integrated in the cardio workflow. The FAST Cardio Wizard permits training the workflow and provides guidance and support during the examination. This is done, by giving the user step-by-step explanations for cardiac examinations directly in the user interface while preparing the scan. The content is based on the latest cardio application training material and provides helpful tips to avoid common problems and pitfalls. But, of course, the workflow and its description can be fully adjusted to the individual workflow of the user, allowing to fully customize texts and images. This allows institutions to create their own quality standards.



FAST Cardio Wizard guides the user intuitive through the preparation of cardiac examinations with easy to follow step-by-step explanations.

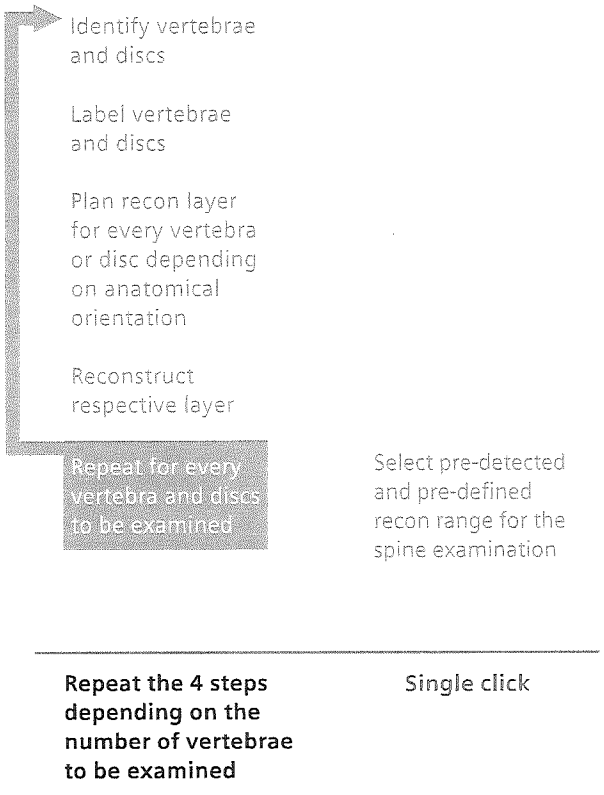
How it works
FAST Spine

Single click spine

Especially in case of the spine, recon preparation can easily take up to half an hour or more when the slices have to be oriented manually and individually along every vertebrae and disc of the spine. FAST Spine now solves this time-consuming situation by providing various modes that automatically create anatomically orientated spine recon ranges. FAST Spine delivers an automatic segmentation of the spinal canal and automatic labeling of the vertebrae.

When certain parts of the spine – or maybe the complete spine – are to be reconstructed, the Spine multi-mode provides anatomically oriented slices that are orthogonal to the spinal canal. The rotation of each single slice refers to the curvature of the spinal column. With the spine disc mode a reconstruction range, placed and oriented on a specific disc, is provided. All modes are automatically prepared by FAST Spine and can be directly chosen in the user interface. Thus the operator can simply prepare an automatically correct spine recon with just a single click.

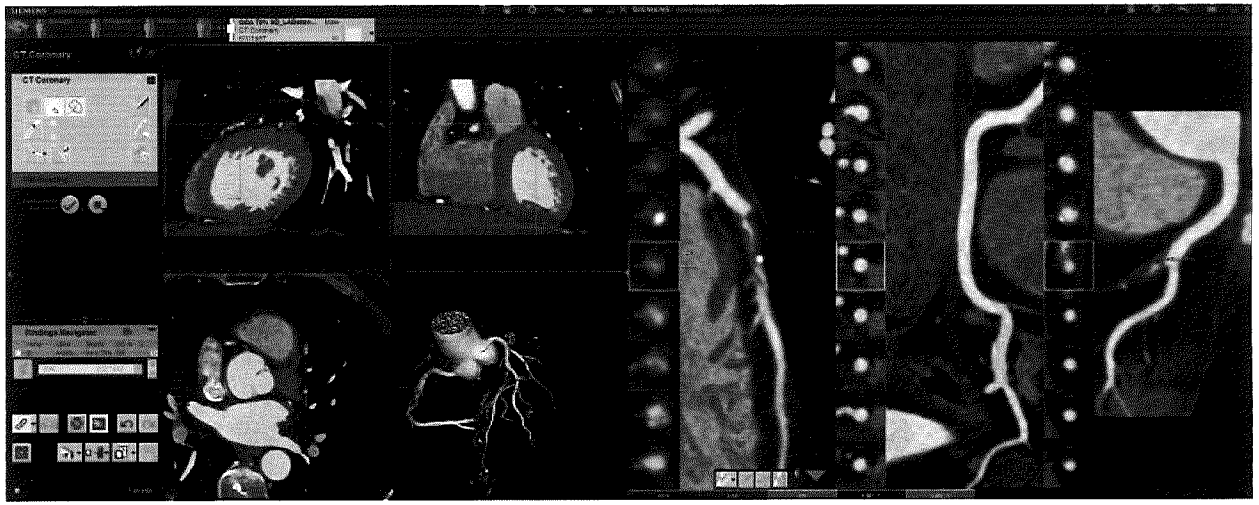
Of course, the final decision is always done by the clinical expert. Therefore all modes offer the possibility to adapt the results manually, if needed.



Additional benefits with *syngo*.via*

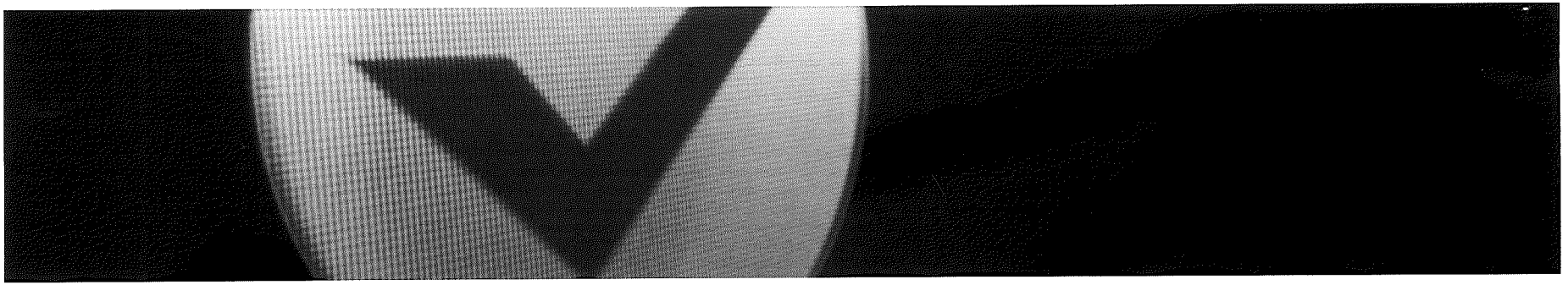
Speed in routine – power in challenging cases

The rule out of Coronary Heart disease has become a common routine procedure in many institutions because of the high negative predictive value of up to 99% with Siemens SOMATOM CT Scanners. A time saving reliable rule-out and reporting therefore can leverage efficiency significantly. *syngo*.CT Coronary Analysis that supports the robust and intuitive VesselSURF tool, allows for immediate 3D vessel assessment of axial slices, even without the existence of centerlines or in occluded vessels. The Single Click Stenosis function gives you all relevant information at a glance, such as the diameter and area stenosis measurements, the plaque composition, the curved length for stent planning, the profile curve and minimum lumen identification.



Dual-monitor layout for instant side-by-side reading. This is the first view directly after loading the patient, here of the left and right carotid artery.

**syngo*.via can be used as a standalone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own rights.



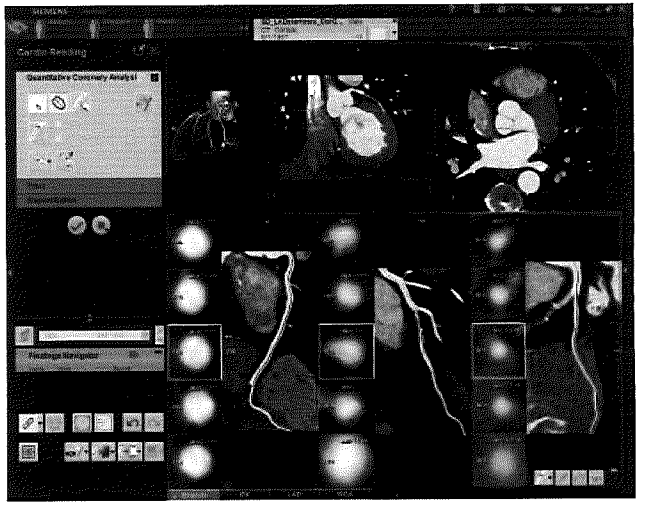
Rule-out coronary heart disease in under a minute

The moment you open a cardiac case the Automated Case Preparation has already pre-processed the images and displays them in your appropriate layout together with the adequate evaluation tools. Meaning you can immediately start evaluating the coronary vessels, the functional parameters and the prepared calcium score.

The comprehensive layout for display of multiple CPR's permits the review of the coronary tree with the blink of an eye. All your findings and key images are collected in the Findings Navigator on-the-fly as you read the case. Your result: rule-out and reporting of coronary artery disease in less than a minute.

The *syngo*.CT Cardiac Function – as part of the CT Cardio-Vascular Engine – allows you to read and diagnose CT angiography images of the left heart for the evaluation of Ischemia or Cardiomyopathy.

On top the application offers to evaluate the late- or early myocardial enhancement of single energetic CT data which is displayed as color overlay. The Cardio-Vascular Engine's Pro level provides right ventricular volumetric analysis, which may have prognostic value for congestive heart failure, chronic pulmonary disease and pulmonary emboli.



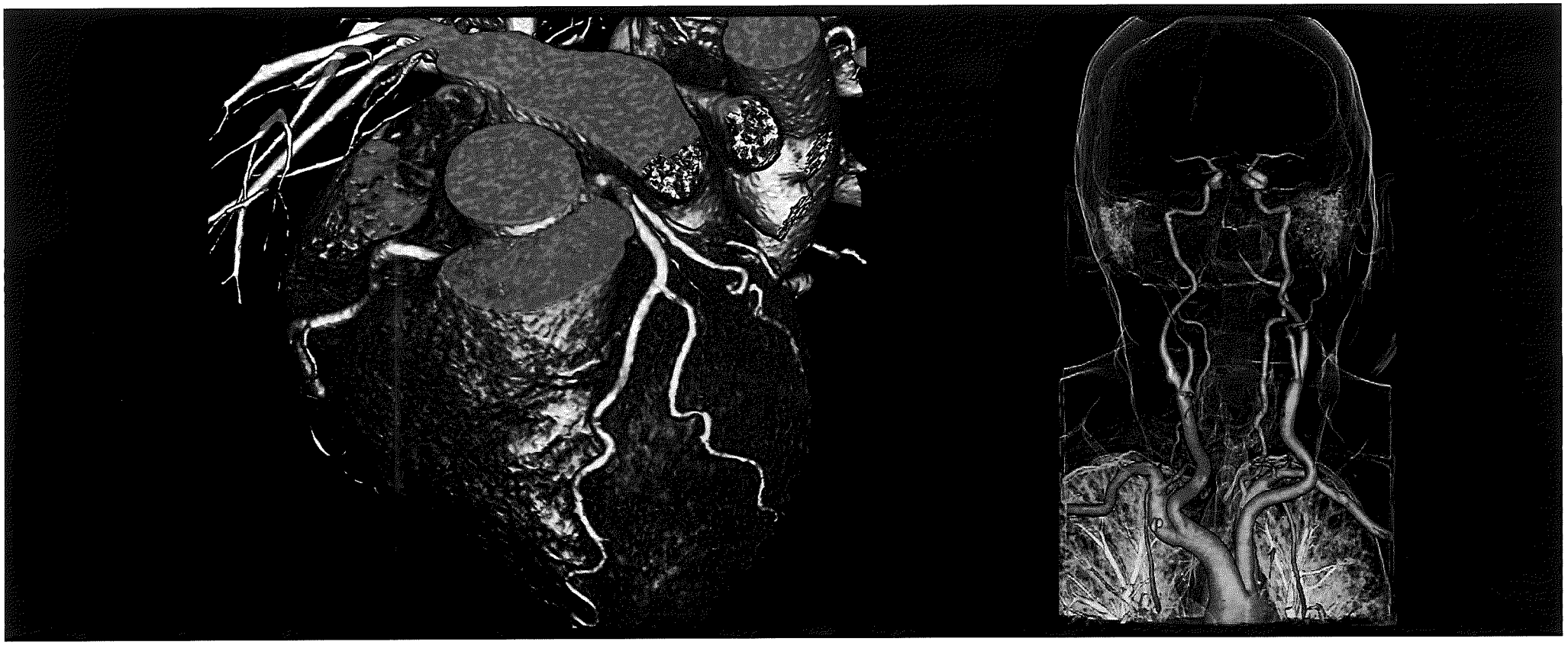
Single-click stenosis measurement. Three reference lines are already pre-defined and displayed side-by-side for immediate overview.

Single-click readiness

Clinical Results

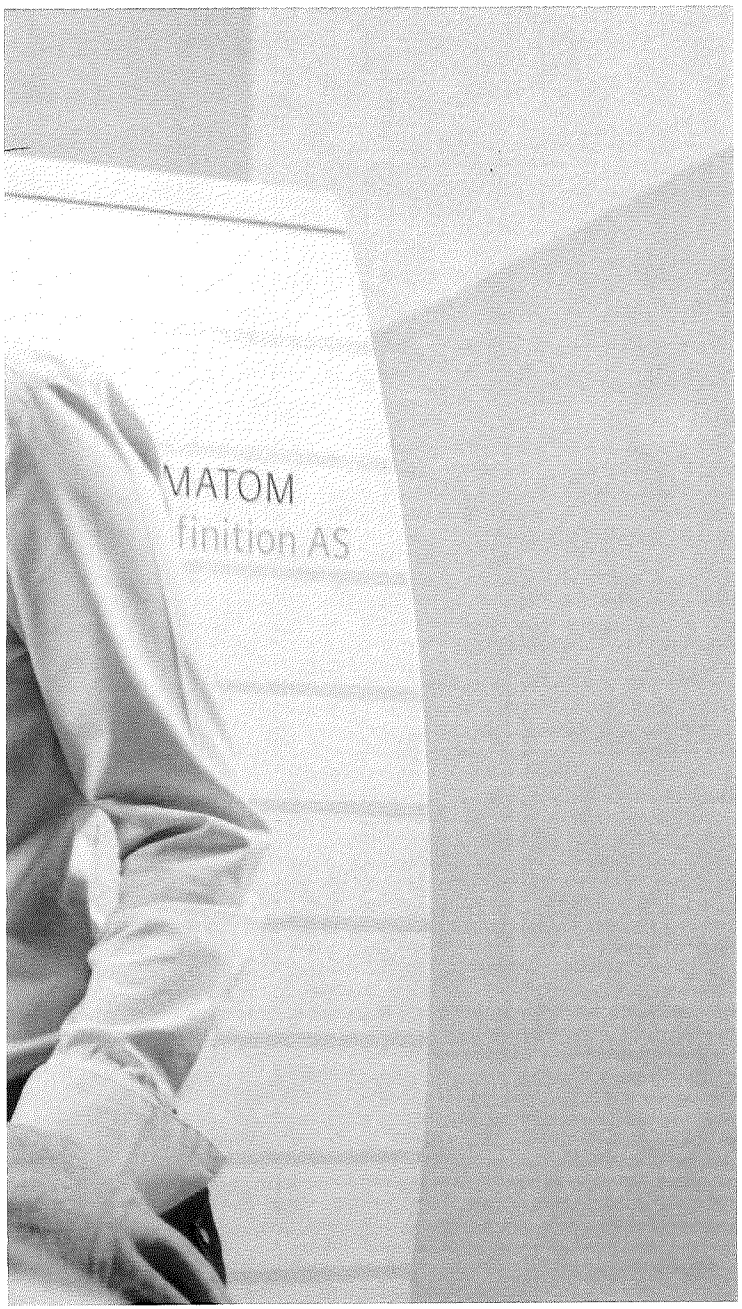
Excellent image quality visualizing even smallest details and with sharp delineation, perfectly adjusted to the selected organ.

Lateral volume rendered view of lumbar spine fused with the multiplanar reformation.



Volume rendered view highlights
the main coronary arteries.

Neuro DSA subtracts the bony structures completely.
A pure arterial vascular filling can be observed.



Your Single Source for Low Dose CT

Applying the lowest radiation dose possible is of utmost importance for both you and of course your patients. Therefore you always want to be assured that you have taken every means available to you to protect your patient from unnecessary radiation.

This desire for as little radiation exposure as possible lies at the heart of our CARE (Combined Applications to Reduce Exposure) research and development philosophy.

Consequently, with Siemens' continuing effort, investment and dedication to achieve highest dose protection, the new SOMATOM Definition AS now uniquely combines all features available for single source CT to reduce radiation as low as possible: next to its already outstanding dose protection portfolio from the initial product generation, it now also inherited features from the highly renowned SOMATOM Definition Flash as well as benefits from the new and innovative dose saving features introduced by Siemens with FAST CARE.

Introduction
Your Single Source for Low Dose CT

Organ-sensitive dose protection

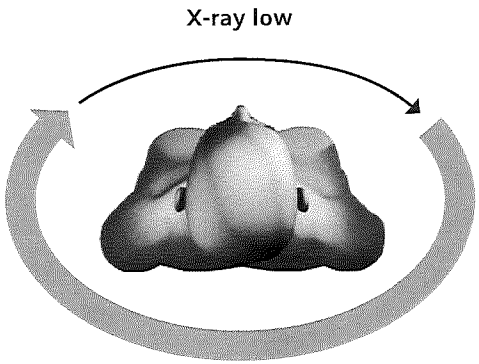
Previous attempts at dose reduction were very successful but did not specifically take into consideration highly dose sensitive areas such as women's breasts or the heart. Now, the SOMATOM Definition AS can selectively reduce the exposure in sensitive areas with Siemens renowned X-CARE. Furthermore, the gantry tilt protects dose sensitive organs like the eyes or the thyroid gland by moving them out of the x-ray beam in sequential or spiral scans.

Low dose cardiac CT

Additionally, to reliably deliver excellent image quality while maintaining lowest possible dose especially in cardiac imaging, the SOMATOM Definition AS offers Adaptive ECG Pulsing for low dose spiral cardiac examinations and the Adaptive Cardio Sequence to reduce radiation down to 1–3 mSv in sequential cardiac CT.

Low dose spiral CT

But besides cardiac, many of today's clinical examinations benefit from spiral acquisition techniques. However, the continuous demand for more coverage and the corresponding increase of detector size has unveiled a new challenge: pre- and post-spiral over-radiation has significantly grown. Introduced in 2007, the Adaptive Dose Shield is Siemens' answer to the problem of over-radiation in spiral CT. It addresses this important safety issue by dynamically blocking clinically irrelevant over-radiation in spiral scans. But of course, not only pre- and post-spiral matters: one of Siemens' core dose protection technologies focuses on spiral scanning in general: CARE Dose4D™. The real-time dose modulation guarantees an unparalleled combination of outstanding image quality at minimum dose for every patient in every spiral scan and has proven its qualities for many years. Now a new dimension has been added: CARE kV can in addition automatically set the appropriate voltage for the examination and adjust other scan parameters accordingly, thus delivering certainty of having highest dose efficiency in every scan, potentially saving up 60% dose.



X-CARE reduces the tube current close to zero within a certain range of projections, minimizing direct exposure for highly dose sensitive body regions.

Iterative reconstruction

One of the most promising approaches for the future of CT presents itself with iterative reconstruction. This method uses multiple iteration steps in the reconstruction of CT data, with every step further eliminating image noise and artifacts and improving image sharpness. In doing so, the reconstruction outcome can achieve significantly increased image quality, reduced dose by lowering the initial power needed to acquire the raw data – or a reasonable balance of both. But the further integration of raw data beyond the initial reconstruction process posed considerable restrains regarding the computational power available – up to now: With SAFIRE – Sinogram Affirmed Iterative Reconstruction – Siemens introduces a new and unique approach to iterative reconstruction. For the first time, raw data information is actually utilized to enhance the image quality or reduce dose. This is made possible by a new reconstruction algorithm, as well as by the introduction of a new image reconstruction system, delivering the required computational power to achieve this.

Dose visualization and management

Increasing patient awareness and safety requirements in the application of X-ray exposure make it necessary when selecting a CT scanner to consider not only the technical features as they exist today, but also developing conditions for the future. Dose management is therefore important to both you and your patients. For this reason, the new SOMATOM Definition AS with FAST CARE actively visualizes dose saving potentials directly in the user interface and gives you the opportunity to manage and analyze the applied dose. This gives you the means to take care of your patients well-being.

*In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software. Noise, CT numbers, homogeneity, low-contrast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.

Your Benefits

- CNR and dose optimized kV settings with CARE kV
- X-CARE protects the most radiation-sensitive organs
- The Adaptive Dose Shield eliminates unnecessary dose in every spiral scan
- Low dose cardiac exams with Adaptive ECG Pulsing and the Adaptive Cardio Sequence
- Excellent raw-data-based image quality improvement or up to 60% dose reduction with SAFIRE*

How it works
CARE Dose4D and CARE kV

Real-time dose modulation

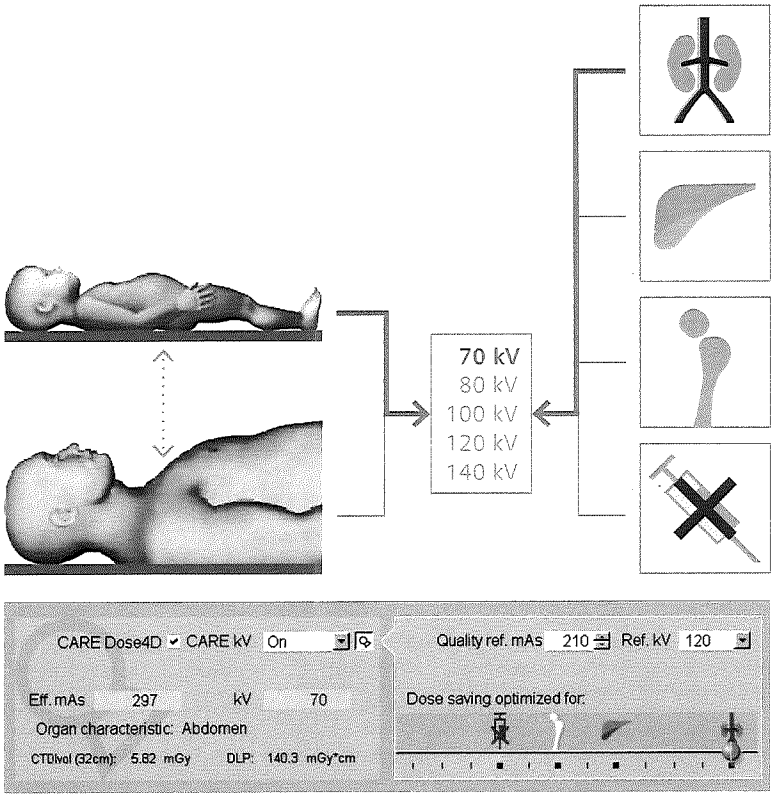
As early as 1994, Siemens introduced CARE Dose4D to actively modulate the applied power for scans depending on the patients anatomy. CARE Dose4D aims to regulate the mAs such that image quality is uniform across the whole scan range. CARE Dose Configurator provides the user the ability to select reference curves for each body region and for each body habitus individually. With the new SOMATOM Definition AS with FAST CARE the configuration options have now been made even more flexible so that they can now be perfectly adjusted for every patient.

CNR optimized kV settings

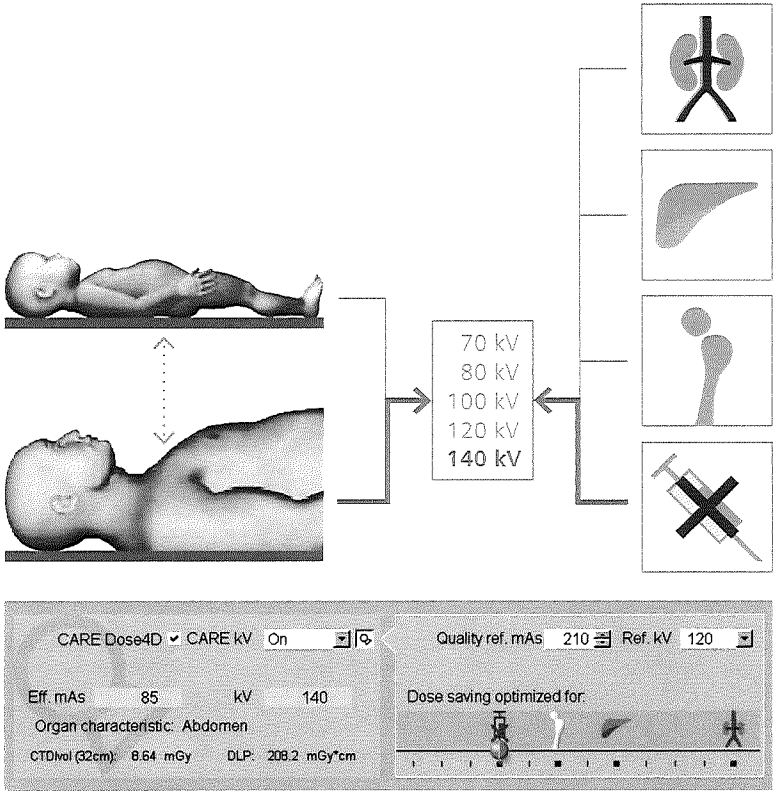
But CT scanning, consists not only of adapting mAs values: The right kV settings play an equal if not even more important role to achieve optimal clinical outcome. But changing kV values always comes along with the need to adapt all other values according to the respective patient. Unfortunately, up to now this had to be done manually and required a lot of expertise and experience so that often the full potential for dose reduction remained untapped. Siemens' unique CARE kV now breaks this barrier: CARE kV, an extension of CARE Dose4D, can automatically suggest kV and eff. mAs to optimize the contrast-to-noise-ratio (CNR) of the image while limiting the applied dose. The system's proposal is based on the attenuation as measured in the topogram and the user-defined acquisition type (non-contrast, bone, soft tissue, vascular). Reducing the tube voltage helps to reduce radiation exposure to patients. With prior tube technology, the minimum tube voltage setting was 80 kV. With the new improved STRATON tube the voltage range is extended down to 70 kV. This helps to further reduce the radiation dose to small pediatric or neonate patients. These dedicated pediatric scan modes, bundled with specific pediatric CARE Dose4D curves and protocols take care of the well-being of our youngest patients. Overall with these features, an additional dose reduction of up to 60% is possible.

On the other side, the system also identifies bariatric patients and consequently sets the parameters to make full use of the system's reserves to optimize CNR and acquire the best image quality possible for these patients.

CARE kV is of course fully customizable, meaning that the user cannot only set his individual quality reference mAs, but can also choose the degree of system assistance between none, semi and full.



Example 1: For a contrast media enhanced vessel examination of a small patient, CARE kV proposes to scan with 70 kV and sets the other values accordingly.

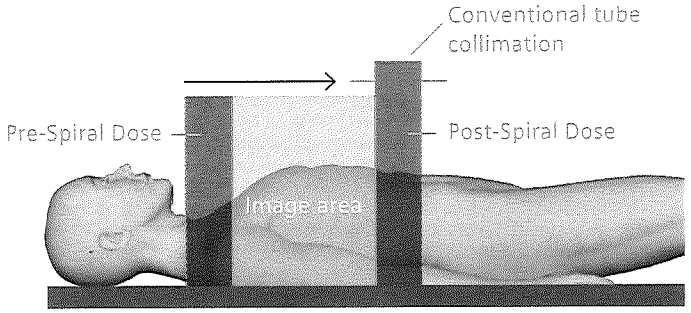


Example 2: For a non-contrast examination of a large patient, CARE kV proposes to scan with 140 kV and sets the other values accordingly.

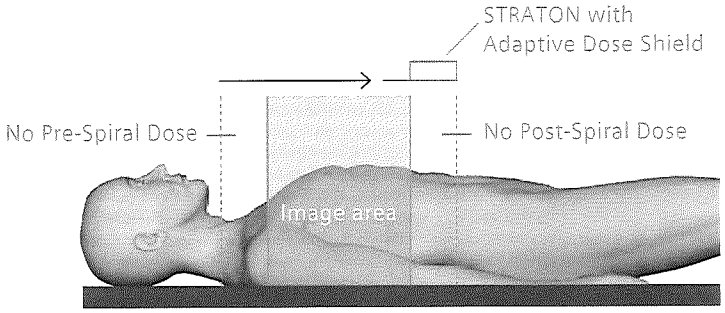
How it works
Adaptive Dose Shield

Eliminating over-radiation in every spiral scan

The SOMATOM Definition AS eliminates pre- and post-spiral over-radiation (marked in red). The Adaptive Dose Shield, is part of the innovative STRATON® X-ray tube design. It automatically moves shields into place to block unnecessary dose. The Adaptive Dose Shield dynamically opens at the beginning of a spiral range and then dynamically closes at the end. Thus clinically irrelevant dose is shielded, not only for dedicated applications, but for all standard spiral acquisitions. Giving you the ability to save up to an additional 25% of dose in routine exams.



Conventional Technology



Adaptive Dose Shield

How SAFIRE works

Iterative Reconstruction

SAFIRE – Sinogram Affirmed Iterative Reconstruction – for the first time allows to utilize the full dose saving potential of the iterative reconstruction in clinical practice. Now, raw-data information (which is visualized in the so-called sinogram) is actually being utilized in the image improvement process.

After the initial reconstruction using the weighted filtered back projection (WFBP) a first iterative reconstruction loop is performed. The CT images are re-transferred to raw-data which models all relevant geometrical properties of the CT scanner. This step re-produces CT raw data like a real scanner does. By comparing this synthetic raw data with the acquired data, differences are identified. A further iteration loop compares the images with homologous reference data. This procedure can be regarded as validating (or affirming) the current images.

An updated image is then again reconstructed, using the detected deviation information. In each iteration a dynamic raw-data-based noise model is applied that allows for reduction of image noise without noticeable loss of sharpness. This optimization process thus makes even better use of the diagnostic information contained in the raw data. Using multiple iterations, geometrical imperfections of the WFBP are corrected in addition to incrementally reducing image noise.

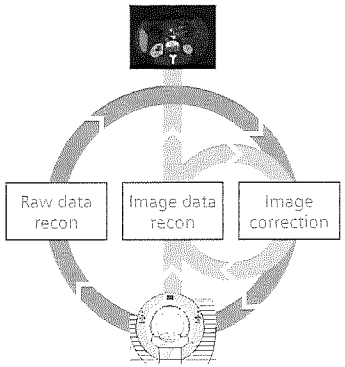
With this, SAFIRE allows a radiation dose reduction of up to 60% or improved image quality in regards to contrast, sharpness and noise*.

*In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software. Noise, CT numbers, homogeneity, low-contrast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.

Standard Filtered Back Projection

- ⊞ Ultra-fast reconstruction without iterations
- ⊞ Well-established image impression
- ⊟ Limited dose reduction

SAFIRE*



- ⊞ More powerful dose reduction than image-based methods
- ⊞ Well-established image impression
- ⊞ Superior image quality
- ⊞ Fast reconstruction in image and raw-data space and improved workflow with variable settings

Additional benefits with *syngo*.via

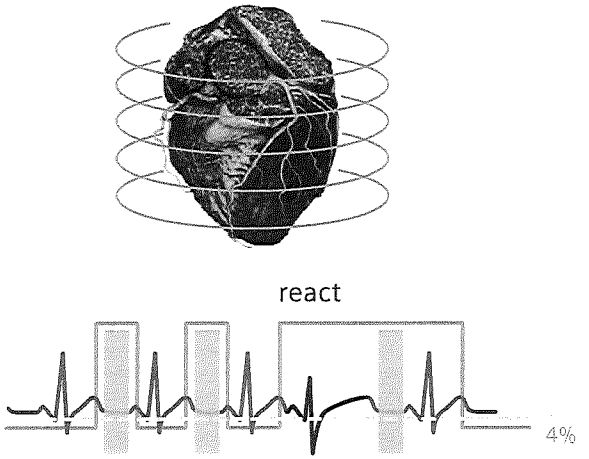
Achieving low dose in cardiac CT

Usually the evaluation of the CT Cardiac Function is based on ECG gated spiral CT data which is relatively dose-intensive. Therefore, Siemens introduced Adaptive ECG-Pulsing™, an innovative heartbeat-controlled dose modulation. It can reduce dose by up to 50% in spiral cardiac imaging by only applying the dose required to collect the necessary data during the diastolic phase. Its real-time monitoring of the ECG automatically and instantly reacts to changes and abnormalities of the heartbeat and reduces the dose in phases in which no data needs to be collected. With Siemens' unique MinDose the pulsing plateau can be reduced to a minimum 4% during this phase, giving additional dose savings.

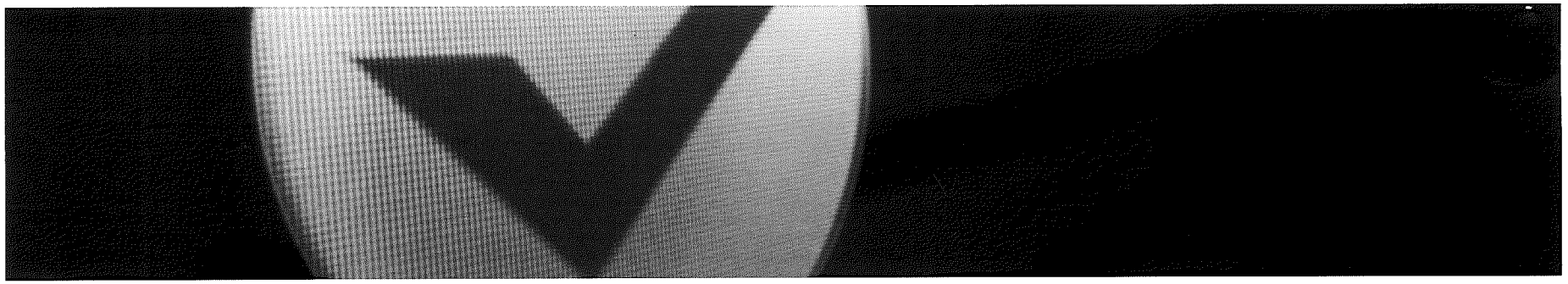
Integrating low dose data with *syngo*.via

The *syngo*.CT Cardiac Function's smart segmentation algorithms can manage this specific MinDose ECG Data which can be used for functional evaluation on top of the coronary assessment. With conventional CT systems, the data acquired during the low pulsing windows is typically discarded without further use, meaning that the patient was unnecessarily radiated. With the integration of MinDose and *syngo*.via, now this data can be intelligently used, saving an additional 20–30% of dose for full functional assessment through the use of MinDose data.

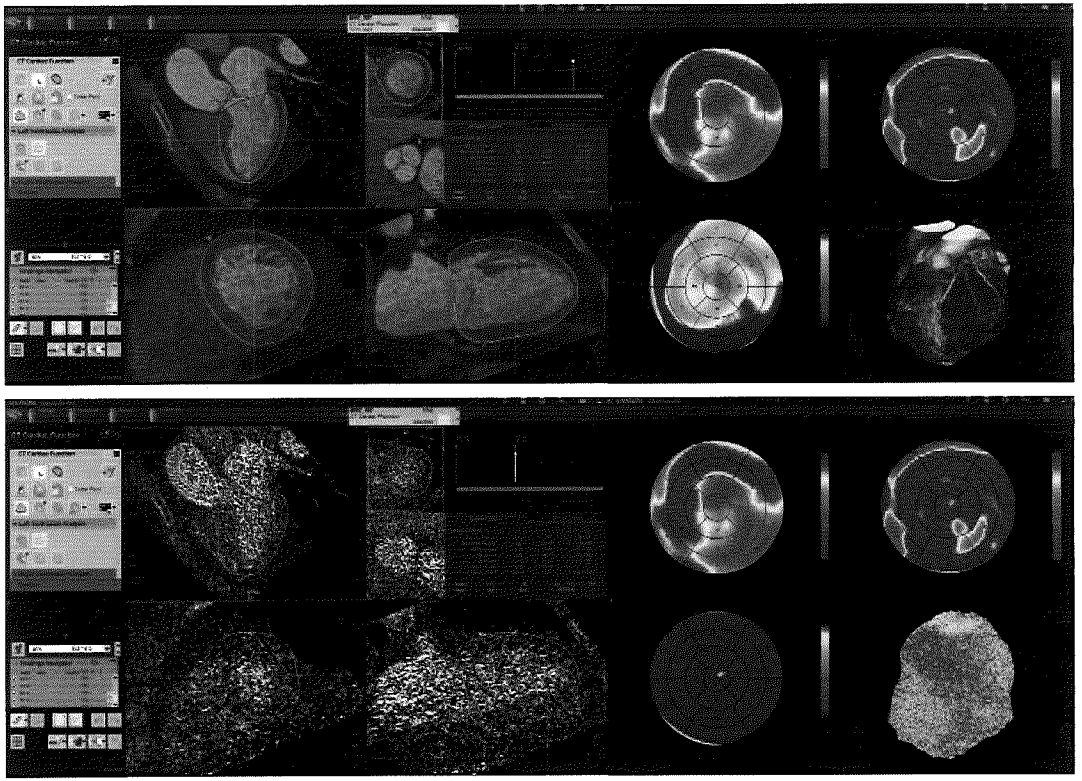
Adaptive ECG-Pulsing in Spiral Mode



MinDose: 4% pulsing plateau instead of 20% in conventional CT systems for maximal dose saving



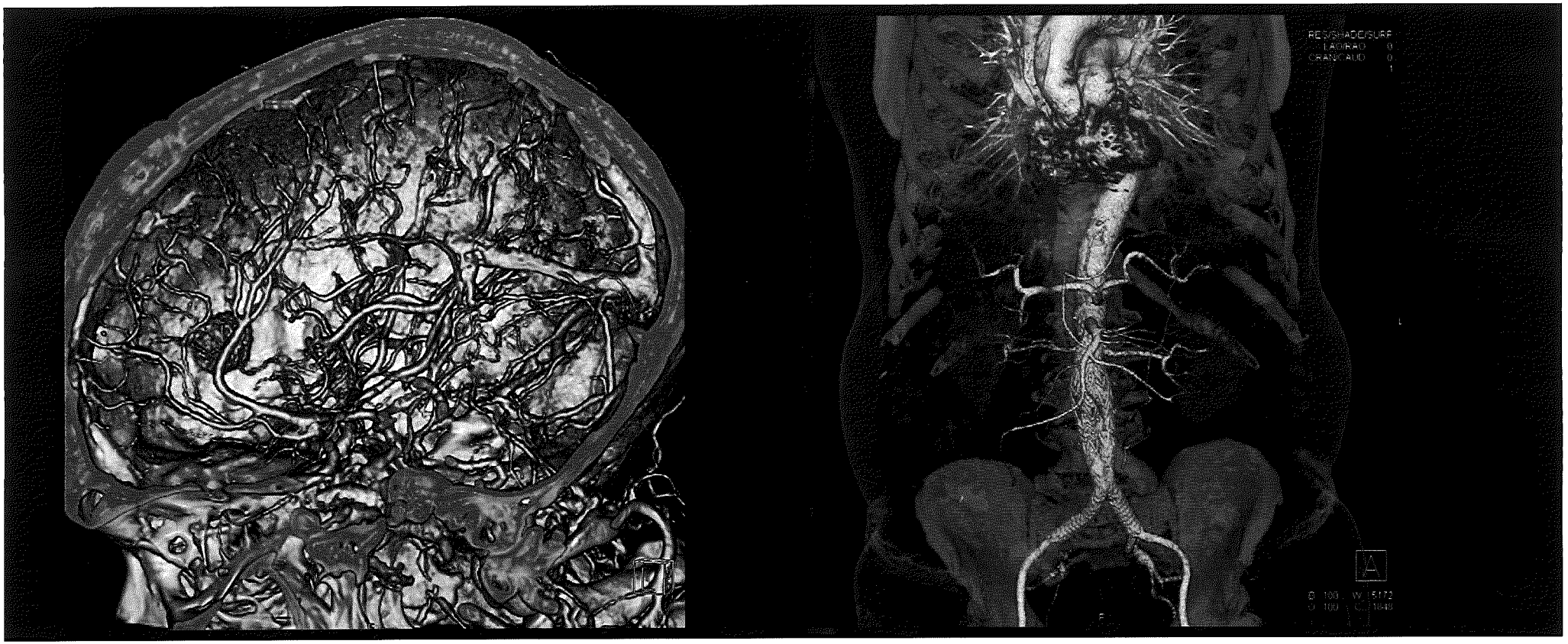
In other words it reduces the dose from 8–12 mSv down to ~ 4 mSv. And with the Automated Case Preparation, all the relevant data for cardiac function is presented when opening the case: including the left ventricular volumetry in all cardiac phases, the ejection fraction and wall motion, the wall thickness and the enhancement color overlay. The results of the myocardial evaluation are presented to you in easy-to-read polar maps and graphs of the ventricular volumes.



Functional evaluation of the heart using data from peak pulsing window (above) and from a 4% MinDose pulsing window (below).

Your single source for low

Clinical Results



Excellent visualization of intracranial arteries including cerebral lesions with *syngo*.CT Neuro DSA. Saving up to 20% dose in head scans with the Adaptive Dose Shield.

Better contrast and lower dose – aortic CTA image acquired with 100 kV and SAFIRE technique demonstrates clearly the vascular structures in detail and the aortic stent.

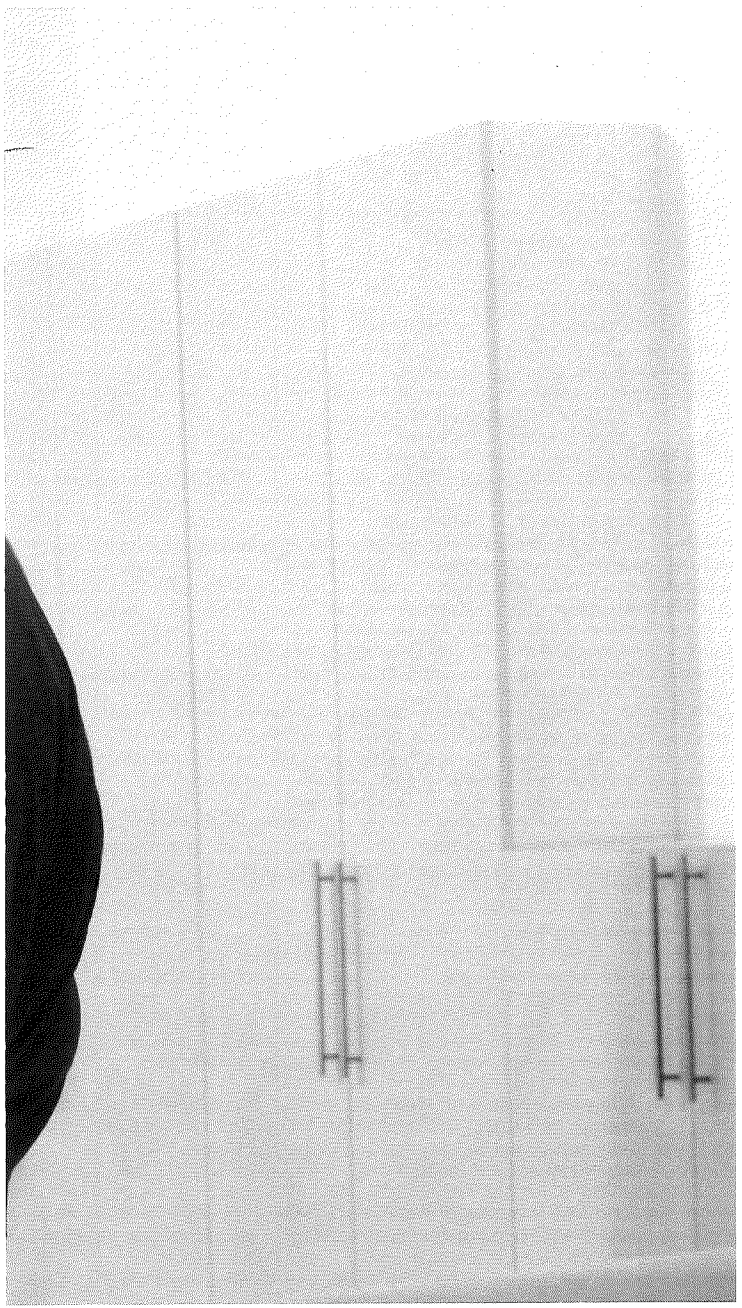
dose CT

SAFIRE – Sinogram Affirmed Iterative Reconstruction – helps to lower the dose or improve image quality. The left image shows the original image. The right image shows how iterative reconstruction can improve image quality at lower dose*.

2.5 mSv imaging of the coronary arteries including sharp distal branches with fast 0.30 s rotation time and 0.33 mm isotropic resolution.

*In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.


SIEMENS



Open CT for all Patients

Every patient is different. So is every clinical question. Our goal was to create a new kind of CT that is actually open for every patient and addresses the versatile needs of physicians. The result is a system with an exclusive composition of features and functionalities that make it the perfect fit for your dedicated clinical field. Whether you want to master the toughest battles in cardiac or acute care, want to excel in neurology or oncology or just want to be sure not to exclude any patient from pediatric to bariatric, the new SOMATOM Definition AS with FAST CARE the ideal single source CT for your needs.

With its full on-site upgradability from 20 to 128 slices, it can grow with your demands and can be fully customized to your requirements. And, it supports you in overcoming limitations posed by conventional CT systems with a bore diameter of up to 80 cm and a table load capacity of up to 300 kg.

The SOMATOM Definition AS with FAST CARE will deliver clinical excellence independent from the given conditions and opens CT for all patients.

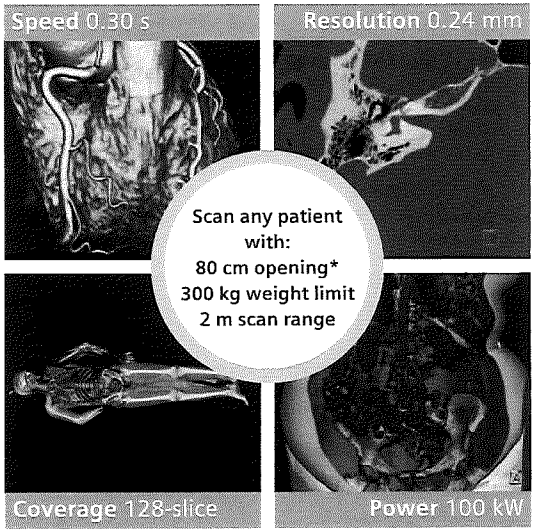
Introduction
Open CT for all Patients

Clinical excellence for every patient

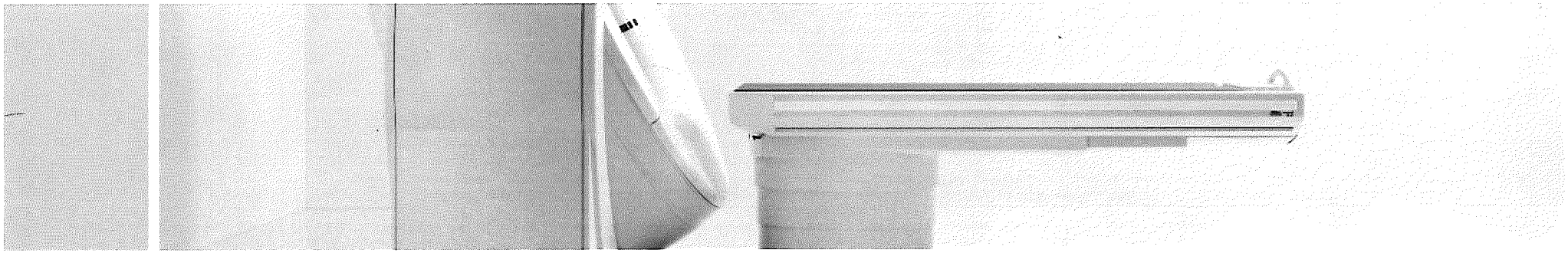
When in comes to mastering your challenges in everyday's clinical practice, you need to rely on your CT system to deliver clinical excellence in every case without exception. And these challenges are various: cardiac CT requires highest temporal resolution to freeze any motion and make even finest details, like small vessels, crystal clear. In acute care scenarios, the same applies. But here in addition, the coverage speed must be as high as possible to quickly scan uncooperative or unconscious patients with short breath-holds, if needed, over the whole body. The key to this is the unique and renowned STRATON tube.

Next to resolution, neurology also requires a very high gray-white matter differentiation to distinguish precisely the brain tissues. Here, Siemens' unique Neuro BestContrast is benchmark. By separately processing medium and low frequency information, tissue contrast can be significantly improved without amplifying image noise. This results in a better signal to noise ratio.

But next to the clinical outcome, it is equally important that the CT system is open for all patients. No one should be excluded by limitations of the system. For bariatric patients, patient accommodation and power reserves are key. Here, the SOMATOM Definition AS is the only system offering up 80 cm bore diameter*, 300 kg table load capacity and a 100 kW power generator. For pediatrics, on the other side, the possibility to reduce kV as low as possible is imperative. Again the SOMATOM Definition AS delivers, with industry's first and only 70 kV scan modes in single source CT. And the unique thing is, that this can all be done with out making compromises between image quality, performance or clinical efficiency.



*Depending on configuration.



Growing with your clinical demand

Next to clinical flexibility, the SOMATOM Definition AS can be configured and customized to fit virtually any setting. Its full on-site upgradability from 20- to 128-slice configuration permits specifying the system precisely to the customer's clinical requirements and financial situation, and also gives investment protection and an assurance to grow with future demands.

Overcoming limitations

And to offer the best financial solution overall, a high-end CT system must meet the infrastructure of the customer. With a footprint of only 18 m² and flexible air- or watercooling the SOMATOM Definition AS can be fit in environments as small as mobile containers or as complex as multi-room sliding gantry scenarios.

But true flexibility does not end at performance, ergonomics or siting. It also means, crossing borders of conventional CT. Dynamic imaging has become a new dimension in CT over recent years. But the challenge is going beyond a static detector design to cover whole organs, e.g. for whole brain perfusion or long-range CTAs. With the innovative Adaptive 4D Spiral, the SOMATOM Definition AS offers the possibility to cover up to 42 cm which is unique in single source CT. Another example are interventions. With the only 3D guided guidance for minimally invasive procedures, the SOMATOM Definition AS makes interventions more accurate, thus safer and in the end more efficient.

And there are departmental borders: E.g. radiation therapy has different requirements regarding CT than a traditional radiology. And they are met: With the only high-end CT dedicated to RTP – the SOMATOM Definition AS Open.

Managing your daily routine

In addition CARE Contrast III facilitates contrast enhanced clinical workflow by synchronizing CT scan and contrast media injection. The injection parameters are automatically transferred to the patient protocol, the e-Logbook and to MPPS thus completing the data for the examination and avoiding separate documentation. And injector protocols can be managed at the CT console and from there also uploaded to the injector.

Your Benefits

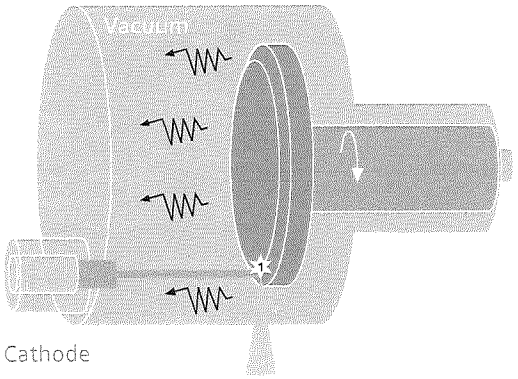
- Enough power reserves, large bore, and high-capacity table for bariatric imaging
- Highest spatial resolution to visualize even small details
- Full on-site upgradability from 20 to 128 slices
- Dynamic CT imaging with up to 42 cm coverage using the Adaptive 4D Spiral
- 3D image guidance in minimally invasive procedures simplifies complex interventions

How it works z-Sharp

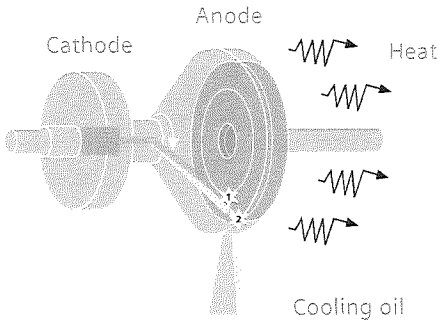
Unique STRATON X-ray tube

The core technology that allows the new SOMATOM Definition AS with FAST CARE to deliver clinical excellence, is the highly renowned STRATON™ tube with z-Sharp™. Its revolutionary design based on a direct anode cooling eliminates the need for heat storage and results in an unmatched compact design thus allowing true temporal resolution of up to 150 ms. Instead of decreasing the detector elements' size to improve spatial resolution, z-Sharp utilizes two overlapping X-ray beams, resulting insignificantly increased resolution without a corresponding increase in dose.

This provides you with the industry's highest isotropic resolution of 0.33 mm at any scan and rotation speed, and at any position within the scan field. This for instance allows to significantly reduce motion artifacts of the heart to perform accurate stenosis measurements or stent planning with outstanding precision or fast whole body sub-mm imaging at highest pitch revealing finest details in long-range vascular studies, or polytrauma patients while covering a 2 meter scan range in approximately 10 seconds.



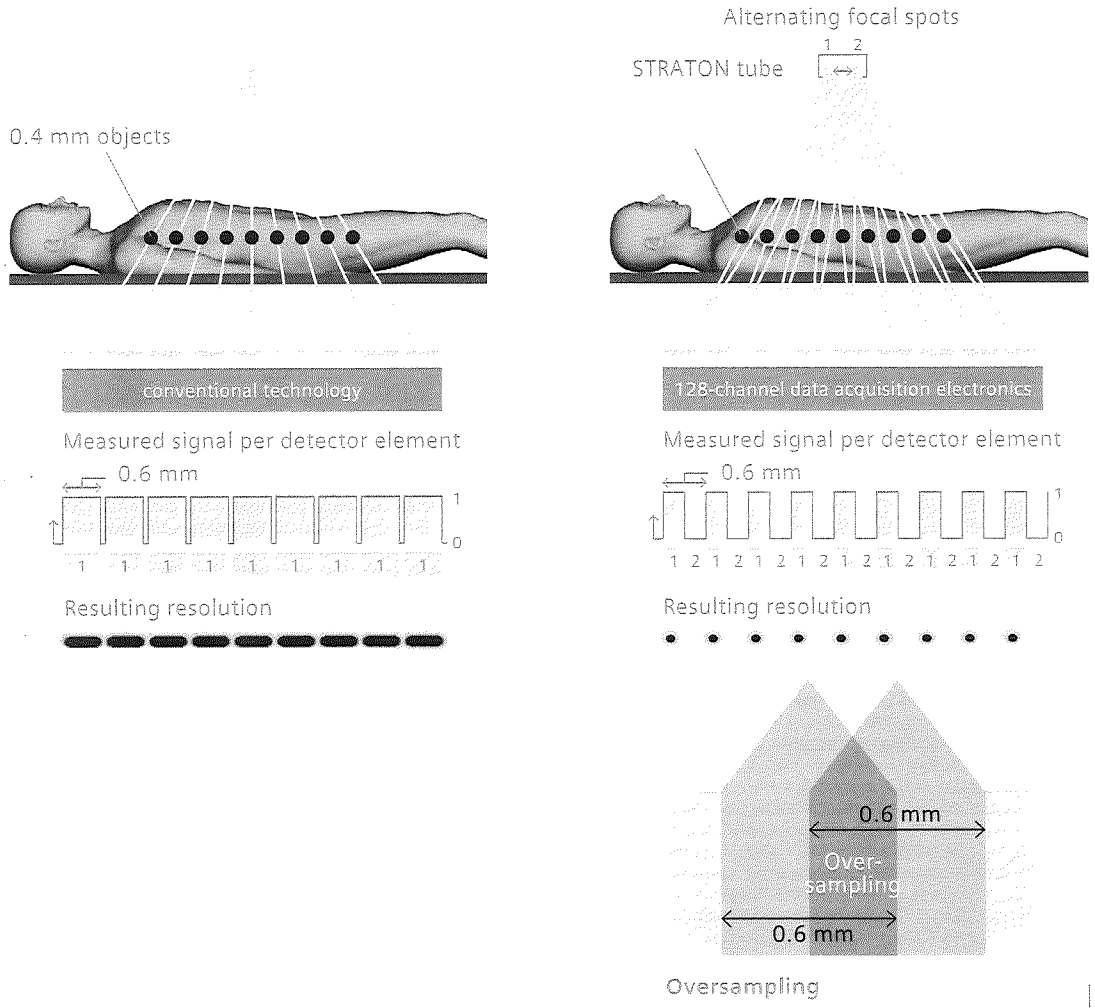
Conventional tube technology



STRATON X-ray tube with z-Sharp generating two distinct x-ray projections

Highest spatial resolution

In addition, with the proprietary z-UHR Technology, the system adapts for ultra-high-resolution bone imaging for wrist, joint, or inner ear studies pushing the boundaries of spatial resolution even further by providing unparalleled 0.24 mm isotropic resolution. Neuro exams benefit from an extremely high detail delineation resulting from the 1,472 inplane channels of the detector.



How it works
Adaptive 4D Spiral Plus

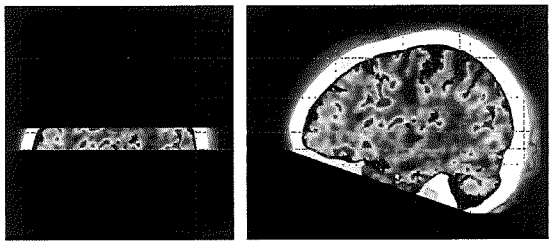
4D Imaging with up to 42 cm dynamic scan range

In 2007, Siemens first introduced the revolutionary scan mode, Adaptive 4D Spiral, overcoming the existing limitations of dynamic CT studies. With conventional CT and its restricted coverage, whole organ perfusion studies or long-range phase resolved CTA studies, were just not possible. The industry's initial attempts to conquer these limitations focused on detector size but made no significant progress in covering entire organs. Today, the innovative Adaptive 4D Spiral Plus applies a continuously repeated bi-directional table movement, moving the patient smoothly in and out of the gantry over the desired scan range. This way the coverage limitation of a static detector design can be overcome. For example, the new SOMATOM Definition AS can perform a phase resolved CTA study over a length of 42 cm, providing a clear separation of arterial and venous phase. Now for the first time in perfusion studies, you can cover virtually any organ in 4D, such as performing a complete stroke assessment with *syngo* Volume Perfusion CT Neuro.

4D Noise Reduction

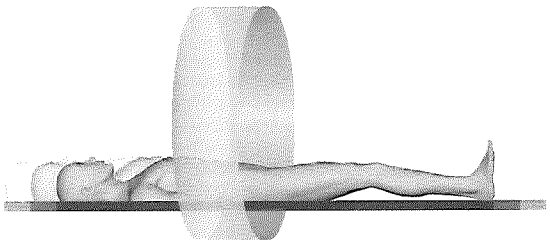
Another exciting further development, 4D Noise Reduction, makes it possible to significantly improve image quality with no increase in dose or, alternately, reduce dose up to 50% without compromising image quality.

syngo Volume Perfusion CT Neuro



Conventional Perfusion

Adaptive 4D Spiral Perfusion



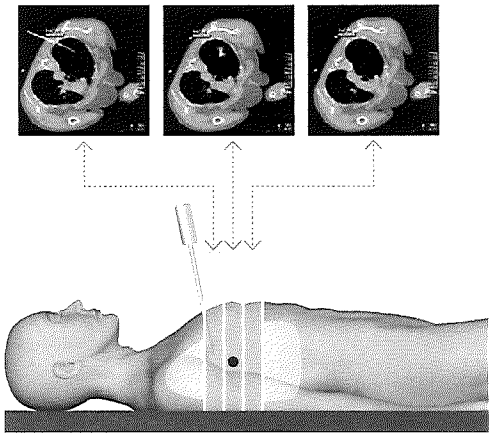
Repeated bi-directional table movement for smooth spiral shuttle scan overcomes the limitation of static detector design

How it works

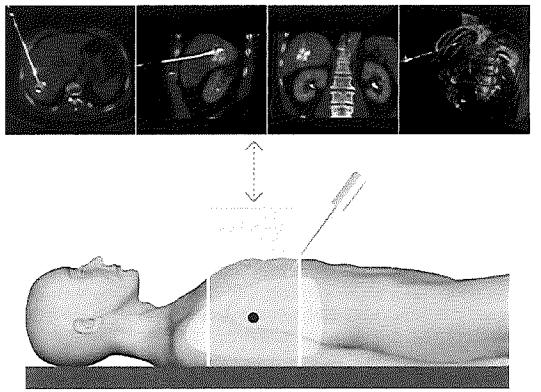
Adaptive 3D Intervention Suite

3D guided interventions

The SOMATOM Definition AS puts you in full control in any plane with 3D-guided interventions. Giving you a more accurate overview of your needle position and surrounding organs during difficult procedures. This is especially helpful when using oblique needle positions, whether you perform fluoroscopic or non-fluoroscopic procedures. And, when it comes to in-room operation, the SOMATOM Definition AS offers the freedom to manipulate the entire procedure with just the touch of a button – without ever leaving your patient's side. From table positioning, image windowing to remote mouse control. The new SOMATOM Definition AS gives you the opportunity to easily switch between fluoroscopic, sequential, or spiral scanning, with a click of a button right at the scanner. By switching to a short spiral scan, you can extend the coverage to visualize an area larger than a static detector design traditionally allows. Furthermore, the SOMATOM Definition AS eliminates artifacts caused by the needle material. Depending on the size of the needle, the scan will be done in a certain angulation of the gantry. Images will be reconstructed as non-tilted axial slices, giving you the same information but without artifacts. Additional workflow enhancements, such as auto needle tracking, will speed up your workflow by guaranteeing that you always have the right view of your needle. The benefit? As a 3D minimally invasive suite, SOMATOM Definition AS makes your routine and complex procedures easier and more accurate. Adding precision while reducing procedure time. Freeing up the CT suite and bringing you new revenue opportunities.

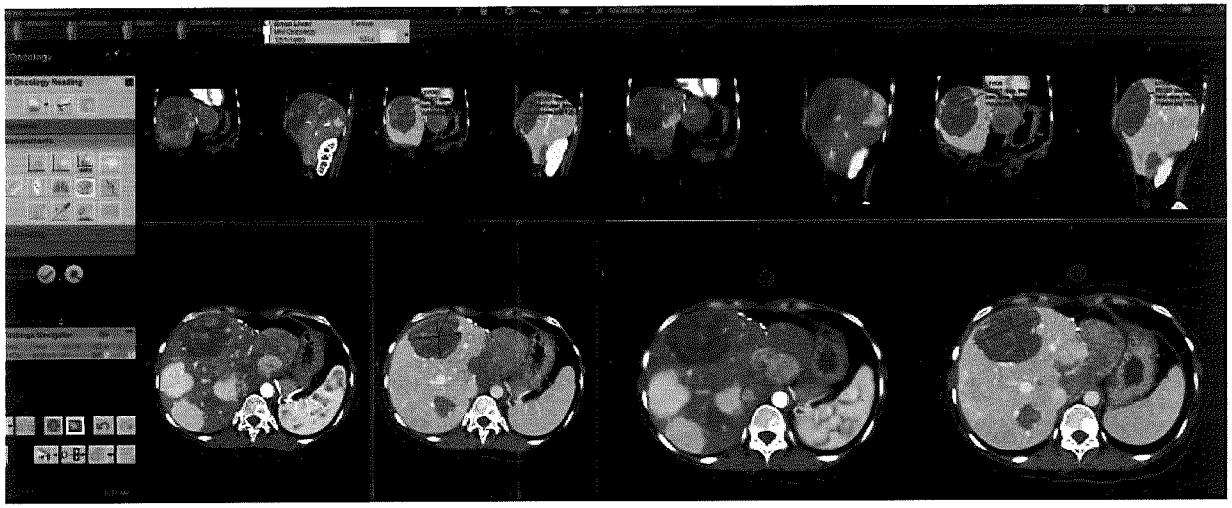


Conventional 2D Intervention



Adaptive 3D Intervention

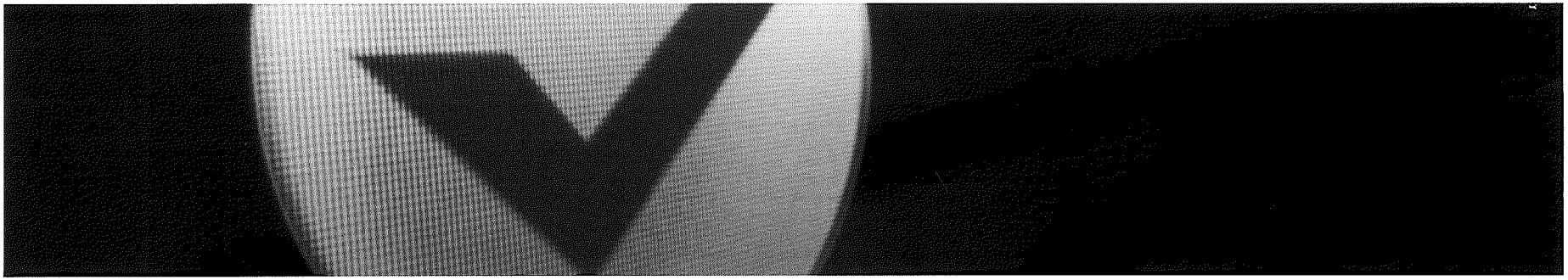
Additional benefits with *syngo*.via*



Holistic oncology imaging

Cancer threatens the entire body. Fighting it therefore demands a holistic understanding of the disease. Irrespective of whether potential lesions are found in lung, liver, lymph nodes or other organs, and regardless of whether the chest or the abdominal radiologist makes findings, or whether lesions are discovered in CT, MRI or PET: the Findings Navigator collects all findings and measurements related to the individual patient. Everybody involved in early detection, diagnostics and the treatment of cancer can retrieve the most complete information, and can see the whole disease, and hopefully, fight it more effectively.

*_syngo_.via can be used as a standalone device or together with a variety of _syngo_.via-based software options, which are medical devices in their own rights.



These images will be registered automatically with the CT data sets and displayed to you on up to two monitors at your favorite workplace. The anatomical registration facilitates synchronized scrolling and rotating.

Using the perfusion information provided by the Adaptive 4D Spiral, the tumor can be characterized and treatment response can be evaluated fast and reliably. For this, *syngo*.via* automatically looks up and aligns data from prior examinations, so that the treatment success can be easily monitored. Additionally, the tumor growth rates and tumor burden can be calculated automatically.

syngo.via can be used as a standalone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own rights

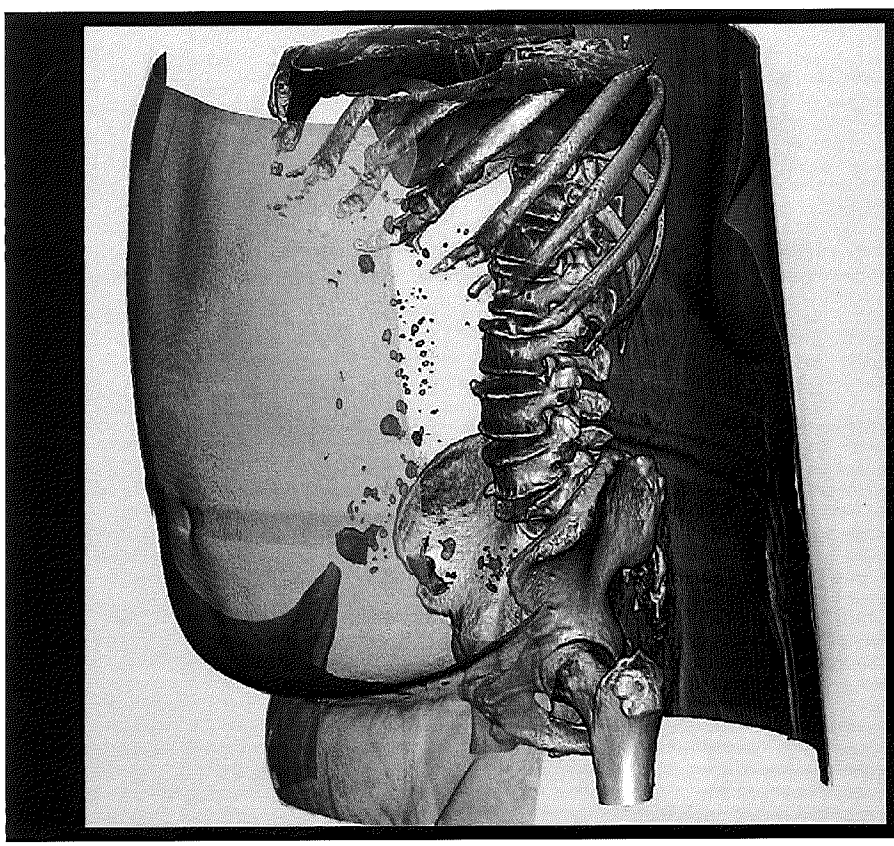
From scan to diagnosis in under 10 minutes

CT Neuro imaging is very often a matter of life-and-death therapeutic decision-making. From infarctions caused by stroke and extensive bleeding, to subarachnoid hemorrhage and a ruptured aneurysm – seeing them clearly is essential because of the huge difference it makes in determining treatment.

The new CT Neuro Engine provides tools and workflows that help deliver a complete and accurate status of the vascular structures and the brain tissue for these patients – from scanning to diagnosis in less than 10 minutes. Using data delivered by the Adaptive 4D Spiral, perfusion assessment of the whole brain can easily be integrated in the assessment. The CT Neuro Engine also helps identify fractures after an accident and, for instance, uncovers the potential risk of death when looking at the vascularity of the neck, by identifying potential stenoses.

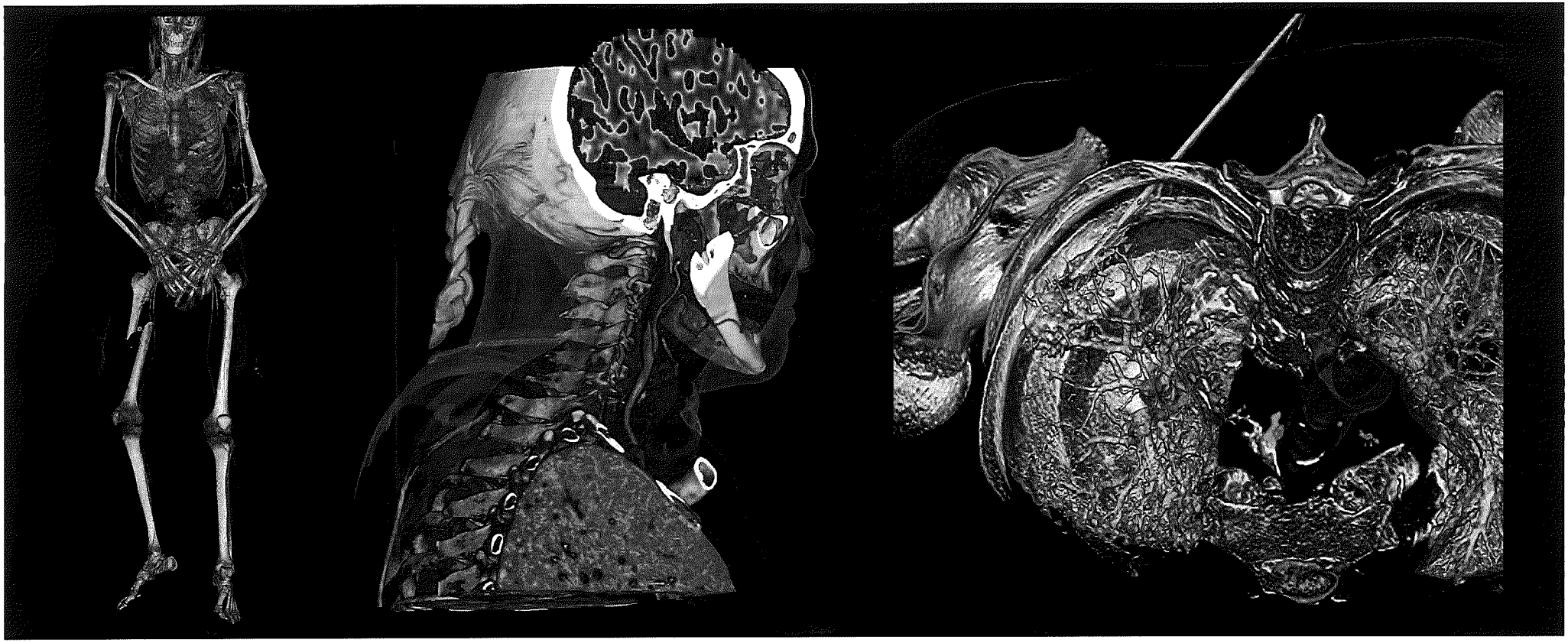
Open CT for all patients

Clinical Results



Abdominal examination of a bariatric patient unveils a kidney stone in the right kidney.

Extremely sharp visualization of the coronary artery tree including distal branches with fastest 150 ms temporal resolution and 0.33 mm spatial resolution.



Fastest volume coverage for single-source CT of 192 mm/s to examine multi-trauma patients for fractures and vascular injuries in one scan up to 2 meters.

Whole brain perfusion study with Adaptive 4D Spiral for comprehensive tissue at risk classification in the entire organ.

Lung biopsy with 3D visualization of double oblique needle position.

UPTIME Services

A partner at your side

With Siemens, systems and services go hand in hand. High system availability, diagnostic confidence and optimized workflow are crucial for the success of your CT.

To meet your performance expectations, we systematically focus on being pro-active. That's why we developed our pro-active service solutions that help you increase system availability, reliability, and workflow efficiency. We also support you with different types of training and provide support for existing applications and functionalities, even remotely.

A smart investment and seamless support

As a pro-active service provider, Siemens UPTIME Services focuses on real-time remote monitoring and preventive maintenance of medical hard- and software. That's how we solve problems before they even occur, thus enabling increased system availability, optimized performance and workflow efficiency.

- Offering our innovative service portfolio we will keep you on track:
- Siemens Performance Plans
- Siemens Guardian Program™
- Siemens Virus Protection
- Siemens Utilization Management

Siemens Performance Plans – tailored to meet your specific needs

Service and maintenance are highly important to prevent unscheduled downtimes and thus to improve your workflow. Siemens Performance Plans are designed to help you run your operations smoothly – with predictable costs, lower risks and higher efficiency. Modules can be combined together with your Performance Plan Pro, Plus or Top and an individual solution with substantial benefits for you can be achieved. E.g. our Siemens Virus Protection offers top-level defense in safeguarding your CT against viruses, providing exclusive and reliable support in getting your system back online again fast.

Education – broaden your knowledge and expertise

Know-how is your key to success. With our extensive portfolio of education and training programs, you can deepen your knowledge and clinical expertise.

Depending on the training type you select, you can benefit most from the wide range of choices in our portfolio:

- Individual on-site training
- Classroom training
- Web based training
- Fellowships
- Remote assistance

Training that matches your needs

We offer routine application training and beyond to answer your clinical questions. For example, stroke imaging with latest applications and much more. We show you how to maximize the benefits that can be achieved with our advanced technology helping you to optimize your workflows so you can offer an even higher quality of care for your patients and faster and more efficient throughput for your clinic.

Configuration Overview

SOMATOM Definition AS

20-slice and 40-slice config.

- All routine and advanced applications for clinical practice
- Industry's highest spatial resolution
- Pediatric and bariatric CT imaging with virtually no patient exclusion
- Most comprehensive low dose CT portfolio in single source CT, including CARE kV
- Full on-site upgradability up to 128 slices with 18 m² footprint

Access to:

- Full FAST CARE functionality like FAST Planning to optimize patient-centric productivity
- Iterative reconstruction with SAFIRE
- 3D guided interventional CT
- Dynamic perfusion imaging beyond detector coverage
- Scanner-injector coupling including injector protocol management

SOMATOM Definition AS/AS+ Excel Edition

64-slice and 128-slice config.

- All routine and advanced applications for clinical practice
- State-of-the-art cardio-vascular imaging
- Industry's highest spatial resolution
- High-speed whole body coverage at highest spatial resolution
- Pediatric and bariatric CT imaging with virtually no patient exclusion
- Most comprehensive low dose CT portfolio in single source CT, including CARE kV
- Full on-site upgradability up to 128 slices with 18 m² footprint

Access to:

- Full FAST CARE functionality like FAST Planning to optimize patient-centric productivity
- Iterative reconstruction with SAFIRE
- 3D guided interventional CT
- Long range dynamic imaging for whole organ coverage
- Scanner-injector coupling including injector protocol management

For more details, please also visit www.siemens.com/fastcare

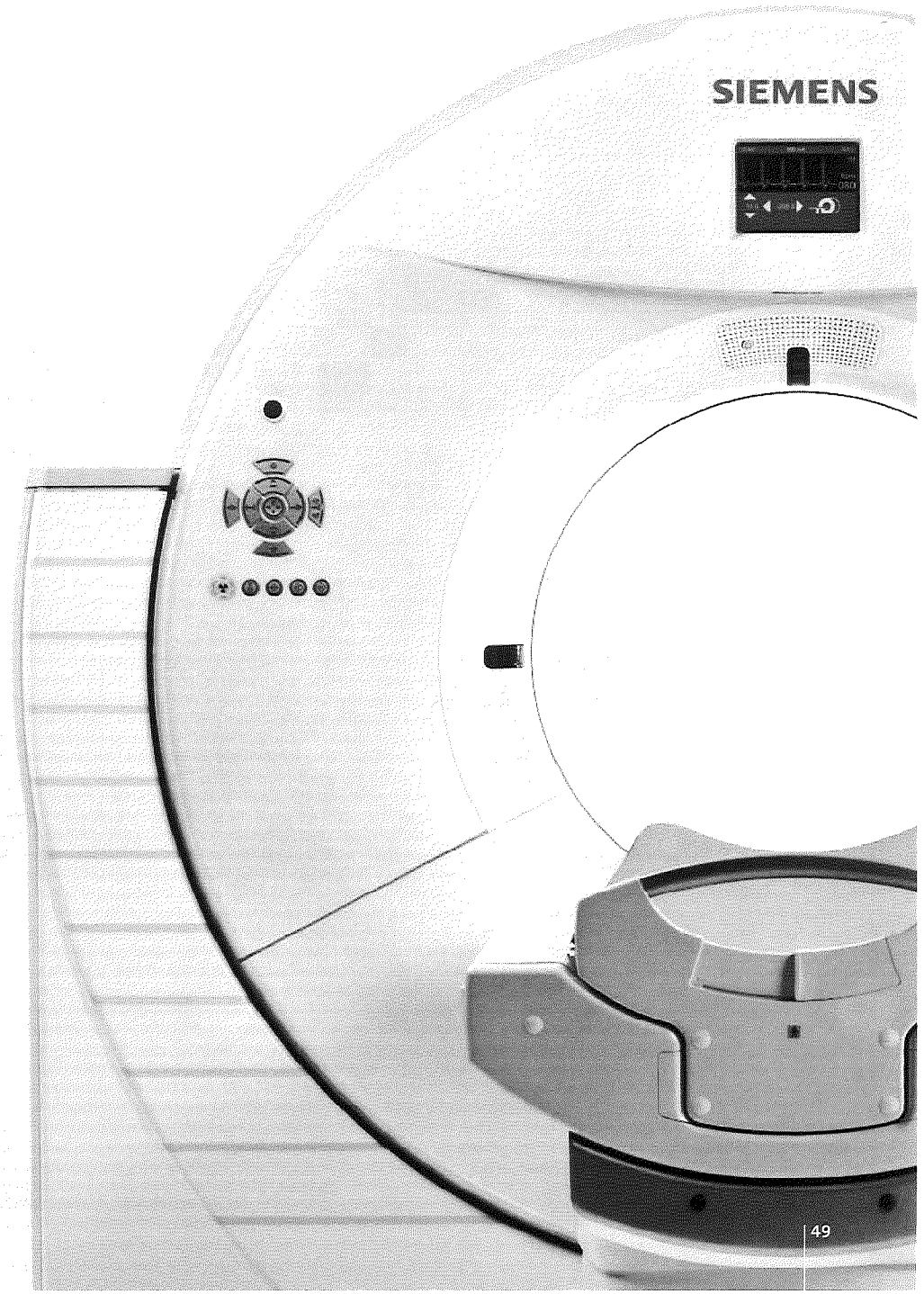
SOMATOM Definition AS/AS+ with FAST CARE

64-slice and 128-slice config.

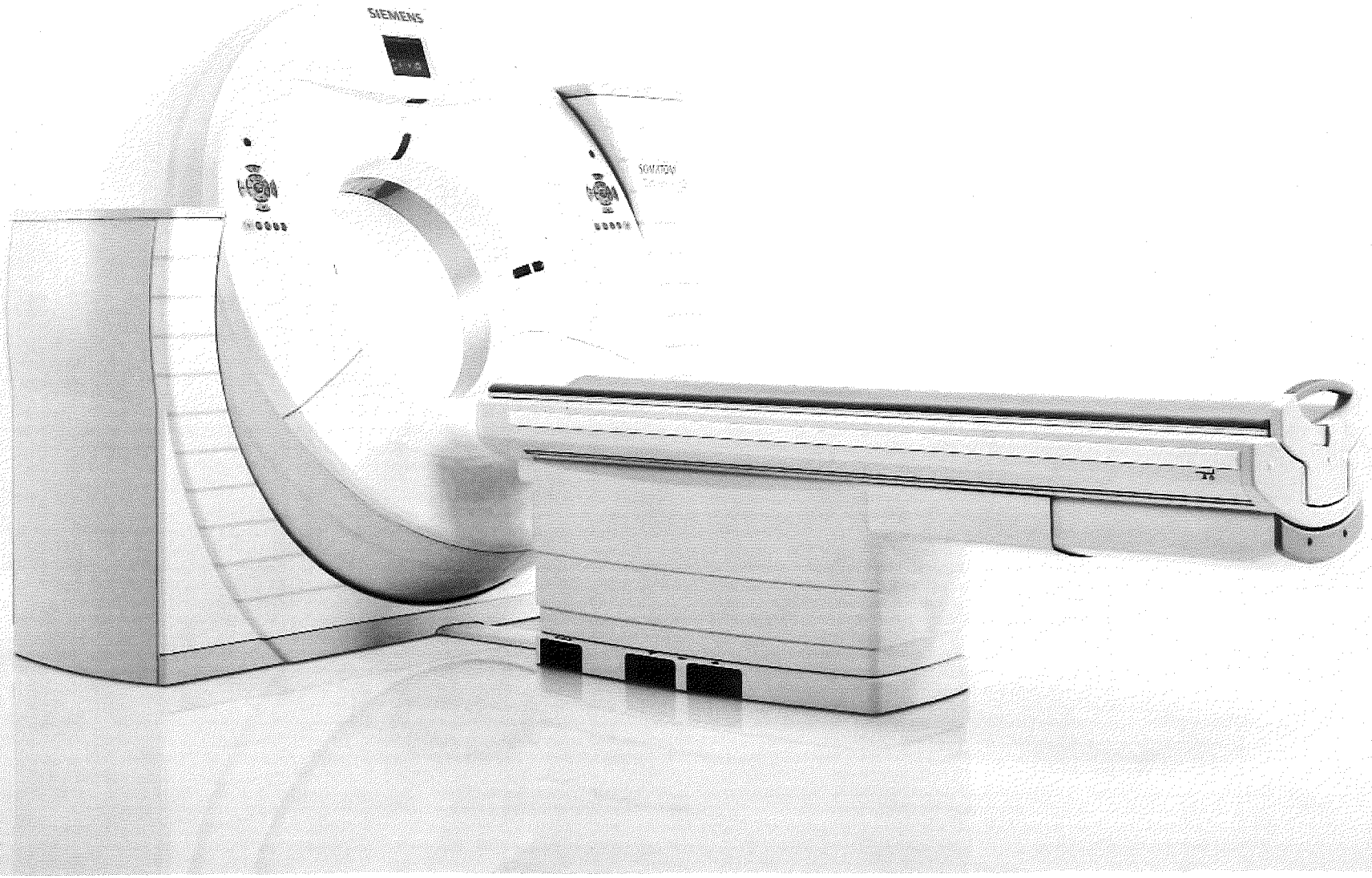
- All routine and advanced applications for clinical practice
- Full FAST CARE functionality like FAST Planning to optimize patient-centric productivity
- High performance image reconstruction system
- State-of-the-art cardio-vascular imaging with high temporal resolution of 150 ms
- Industry's highest spatial resolution
- High-speed whole body coverage at highest spatial resolution
- Pediatric and bariatric CT imaging with virtually no patient exclusion
- Most comprehensive low dose CT portfolio in single source CT, including CARE kV
- Full on-site upgradability up to 128 slices with 18 m² footprint

Access to:

- Iterative reconstruction with SAFIRE
- 3D guided interventional CT
- Ultra-long range dynamic imaging (up to 42 cm) for whole organ coverage
- Scanner-injector coupling including injector protocol management



SOMATOM Definition AS



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The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which do not always have to be present in individual cases.

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PRELIMINARY PROPOSAL

Customer Number: 0000010805

Date: 2/20/2014

UNIVERSITY OF NORTH CAROLINA HOSPITALS
101 MANNING DRIVE
CHAPEL HILL, NC 27517

Quote Number:	**1-6RY12L Rev. 0**
Groups Purchasing Organization	**MedAssets**
Terms and Conditions	**MedAssets**
Trade Information	**Siemens Sensation 16**
Price Valid Through	**09/30/2014**
Notes	**Standard MedAssets pricing**

SOMATOM Definition AS-64 for ACC

All items listed below are included for this system:

Qty	Part No.	Item Description
1	14440593	**SOMATOM Definition AS (64slice)** The SOMATOM Definition AS (64-slice configuration) is Siemens' state-of-the-art single source CT that provides the possibility to maximize clinical outcome and to minimize radiation dose. Using Siemens' z-Sharp technology the system can provide high spatial resolution. The fast rotation time of 0.33 seconds (0.3 s optional) delivers excellent temporal resolution. But the ultimate goal is to provide medical professionals more time for patients while taking best care of their well-being. With this, the SOMATOM Definition AS is set to raise the standard of patient-centric productivity with FAST CARE Technology. With Siemens' FAST - Fully Assisting Scanner Technologies - the SOMATOM Definition AS can simplify typically time consuming and complex procedures during a CT examination: the scanning process gets more intuitive and the results become more reproducible. The CARE technology includes many unique features like CARE kV that sets the ideal voltage for every examination and adjusts the respective scan parameters or industry's first Adaptive Dose Shield that prevents clinically irrelevant over radiation in spiral scanning. Additionally, its large bore of 78 cm and a table load capacity of up to 307 kg (optional) opens CT to virtually all patients, meaning that virtually no patient is excluded and even clinically challenging cases like in the ED or bariatric patients can be imaged rapidly from head to toe without difficulty. And even for CT-guided interventional procedures 2D Basic Intervention and HandCARE(tm) is already included. A 3D intervention suite is optional available.
1	14408328	**ELEVATE O Definition AS** Elevate from an old Siemens CT scanner to a new SOMATOM Definition AS.

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Qty	Part No.	Item Description
1	14420773	**FAST CARE Platform** Siemens' unique FAST CARE platform is set to raise the standard of patient-centric productivity. Utilizing FAST - Fully Assisting Scanner Technologies -, typically time-consuming and complex procedures during the scan process are extremely simplified and automated, not only improving workflow efficiency, but optimizing the overall clinical outcome by creating reproducible results, making diagnosis more reliable and reducing patient burden through streamlined examinations. Siemens' desire for as little radiation exposure as possible lies at the heart of the CARE - Combined Applications to Reduce Exposure - research and development philosophy offering a unique portfolio of dose saving features, many of them being introduced as industry's first.
1	14420771	**CARE Child** Dedicated pediatric CT imaging, including 70 kV scan modes and specific CARE Dose4D curves and protocols
1	14433993	**FAST Planning #AWP** Direct, organ-based setting of scan and recon ranges for a faster and more standardized workflow
1	14419142	**Workstream 4D #AWP** WorkStream 4D further enhances the already superb workflow of the SOMATOM Definition AS CT system by offering direct generation of sagittal, coronal, oblique or double-oblique reconstructed images directly from CT raw data as part of the CT protocol.
1	14419143	**syngo 3D BoneRemoval #AWP** Simple, automated bone removal functionality for the syngo 3D application. Preconfigured algorithms for angiography and hip/pelvis fracture scenarios are included to facilitate fast removal of bone structure for three dimensional presentation and analysis of CT data.
1	14419144	**DICOM SR Viewer #AWP** The DICOM SR (structured report) Viewer allows to read reports created with specific applications (e.g. Circulation, Lung Care, Calcium Scoring and Onco) without the application itself being on the respective computer.
1	14420824	**Standard IRS** Reconstruction computer for the preprocessing and reconstruction of the CT raw data. The reconstruction computer contains a cluster of 2 high-performance GPU boards performing the preprocessing and reconstruction of the CT data. The raw data memory is 900 GByte. The peak recon performance is 40 frames/sec.
1	14420766	**SAFIRE #AWP** The Sinogram Affirmed Iterative Reconstruction (SAFIRE) enhances spatial resolution, reduces image noise and increases sharpness by introducing multiple iteration steps in the reconstruction process. The resulting superior image quality enables to reduce dose by up to 60%*. *In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software. Noise, CT numbers, homogenity, low-contast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.
1	14428058	**Gantry tilt incl. tilted spiral** Allows for sequential scanning with a tilted gantry between +/- 30°, depending on the vertical position of the table. Using the gantry tilt sensitive organs (like eye lenses) can be moved out of the scan range or it eases access during interventional procedures. The tilted spiral allows to utilize the gantry tilt for spiral scan modes.
1	14408111	**Extended Field of View #AWP** Software program with special reconstruction algorithms that allow for visualization of objects using a FOV up to 78 cm (non-diagnostic image quality). License to use software on a single unit.
1	14408152	**UHR** UHR mode delivers Ultra High resolution in plane of up to 24lp/cm for high defined imaging of small structures such as inner ear, joints or fractures of the bone
1	14408032	**Rear cover incl. gantry panels** Rear Cover including gantry control panels with control functionality from the backside.

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PRELIMINARY PROPOSAL

Qty	Part No.	Item Description
1	14408094	**Keyboard English** Keyboard in the above-mentioned language.
1	14408023	**Cooling System Water** Water heat exchanger for the dissipation of heat loss generated in the gantry to an environmentally friendly cooling water circulation system. This optimizes system availability independently of the cooling water flow rate and temperature. System operation temperature 4 - 16 degrees C and 500 - 2500 l/h flow rate.
1	14408026	**Hose pipe insulated 30 m** Hose pipes to connect the "Cooling System" with the gantry.
1	14408031	**Cable loom 25 m** Cable loom used to connect the power distribution system (PDS) with the gantry.
1	14420778	**Multi Purpose Table** Patient table to support up to 200cm scan range. Motor-driven table height adjustment from min. 48 cm to max. 92 cm, longitudinal movement of the tabletop 200 cm in increments of 0.5 mm, positioning accuracy +/- 0.25 mm from any direction. Horizontal scan range 200 cm. Table height can be controlled alternatively by means of foot switch (2 each on both sides of the patient table). In the case of emergency stop or power failure, the tabletop can also be moved manually in horizontal direction. Max. table load: 227 kg/500 lbs, Table feed speed: 2-200 mm/s, Distance between gantry front and table base 40 cm. Positioning aids: Positioning mattress, mattress protector, head-arm support (inclusive cushion), and non-tiltable head holders with positioning cushion set, patient restraining system for head fixation, restraining-strap set with body fixation strap that can be directly connected to the patient table top, headrest, table extension with positioning mattress, knee-leg support.
1	14420921	**Table Side Rails** Side rails enable the quick and easy attachment of additional accessories such as an infusion bottle holder and i-control intervention module to the standard patient table.
1	14408217	**High Cap. Patient & Trauma Tab.Top** The high capacity and trauma table top offers the capability to support up to 307 kg/676 lbs of patient weight. It allows easy positioning and transfer from and to the table, due to its flat surface. Special accessories and an extended table top width of 530 mm ensure a safe and comfortable positioning for obese patients.
1	14408218	**High Cap. Patient & Trauma Acc Kit** The High capacity and Trauma accessory kit contains additional Patient restraint set with a width of 400mm and additional table extensions for feet and head.
1	14414734	**Mattress for Bariatric Table Top** This mat is used for scanning non-bariatric patients on the flat, bariatric table top. Placing this mat on the bariatric table top eliminates the need to exchange the table top when non-bariatric patients are scanned. This mat has a curved profile and enables comfortable positioning of non-bariatric patients.
1	14408101	**Computer Desk #AWP** New CT desk to accommodate the control components and color monitor. Width: 1200 mm, Depth: 800 mm, Height: 720 mm.
1	14408102	**Computer Cabinet #AWP** New cabinet to accommodate the computer system and UPS. Matched to the design of the control console table. Width: 800 mm, Depth: 800 mm, Height: 720 mm
1	14420795	**syngo CT.3D Workplace #CTWP** A dedicated syngo CT processing workplace, designed to optimize data management at the CT scanner.
1	14408094	**Keyboard English** Keyboard in the above-mentioned language.
1	14408134	**Cable 25m #CTWP** 25 meter connection between CT workplace and CT system. Contains both, power and network connection between workplace and the CT system, makes additional power supply unnecessary.

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PRELIMINARY PROPOSAL

Qty	Part No.	Item Description
1	14408139	**Computer Cabinet #CTWP** New cabinet to accommodate the computer system and UPS. Matched to the design of the control console table. Width: 800 mm, Depth: 800 mm, Height: 720 mm
1	CT_RECON_192	**AS-64 slice configuration z-Sharp Tech.** The unique STRATON X-ray source utilizes an electron beam that is accurately and rapidly deflected, creating two precise focal spots alternating 4,608 times per second. This doubles the X-ray projections reaching each detector element. The two overlapping projections result in an oversampling in z-direction. The resulting measurements interleave half a detector slice width, doubling the scan information without a corresponding increase in dose. Siemens' proprietary UFC (Ultra Fast Ceramic) detectors and the corresponding 64-slice detector electronics enable a virtually simultaneous readout of two projections for each detector element - resulting in a full 64-slice acquisition. This sampling scheme is identical to that of a 64 x 0.3 mm allowing for reconstruction of 192 slices using 0.1 mm reconstruction interval increment. z-Sharp Technology, utilizing the STRATON X-ray sources and the UFC detectors, provides scan speed independent visualization of 0.33 mm isotropic voxels and a corresponding elimination of spiral artifacts in the daily clinical routine at any position within the scan field.
1	ADAPT_DOSE_SHIELD	**Adaptive Dose Shield** Adaptive Dose Shield for spiral acquisition to eliminate pre- and post-spiral over-radiation.
1	FAST_ADJUST	**FAST Adjust** FAST Adjust: assists the user to handle system settings in a fast and easy way by automatically solving of conflicts within user defined limits by one single click on the FAST Adjust button. The limits for scan time and tube current per scan are defined via the Scan Protocol Assistant. FAST Adjust offers an undo functionality to return to previously set values.
1	FAST_SCAN_ASSIST	**FAST Scan Assistant** FAST Scan Assistant: An intuitive user interface for solving conflicts by changing the scan time, resp. the pitch and/or the maximum tube current manually.
1	CARE_DOSE4D	**CARE Dose4D** CARE Dose4D delivers the highest possible image quality at the lowest possible dose for patients - maximum detail, minimum dose. Adaptive dose modulation for up to 60% dose reduction
1	CARE_KV	**CARE kV** CARE kV: First automated, organ-sensitive voltage setting to improve image quality and contrast-to-noise-ratio while optimizing dose and potentially reducing it by up to 60%.
1	CARE_PROFLE	**CARE Profile** CARE Profile: Visualization of the dose distribution along the topogram prior to the scan
1	CARE_DASHBOARD	**CARE Dashboard** Visualization of activated dose reduction features and technologies for each scan range of an examination to analyze and manage the dose to be applied in the scan
1	DOSE_NOTIFICATION	**Dose Notification** Dose Notification: As requested by the new release of the standard IEC 60601 3rd edition, the SOMATOM Definition AS provides the ability to set dose reference values (CTDIvol, DLP) for each scan range. If these reference values are exceeded the Dose Notification window informs the user.
1	DOSE_ALERT	**Dose Alert** Dose Alert: As requested by the new release of the standard IEC 60601 3rd edition, the SOMATOM Definition automatically adds up CTDIvol and DLP depending on z-position (scan axis). The Dose Alert window appears, if either of these cumulative values exceeds a user-defined threshold.
1	CT_PM	**CT Project Management** A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen's equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.

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PRELIMINARY PROPOSAL

Qty	Part No.	Item Description
1	CT_BUDG_ADDL_RIG	**Add'l/Out of Scope Rigging @ $5,000**
1	CT_STD_RIG_INST	**CT Standard Rigging and Installation** This quotation includes standard rigging and installation of your CT new system. Standard rigging into a room with reasonable access, as determined by Siemens Project Management, during standard working hours (Mon. - Fri./ 8 a.m. to 5 p.m.) It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents. Any special rigging requirements (Crane, stairs, etc.) and/or special site requirements (e.g. removal of existing systems, etc.) is an incremental cost and the responsibility of the Customer. All other "out of scope" charges (not covered by the standard rigging and installation) will be identified during the site assessment and remain the responsibility of the Customer.
1	CT_STD_DEINSTALL	**CT Standard De-Installation**
1	4SPAS014	**Low Contrast CT Phantom & Holder**
1	PSPD250480Y3K	**Surge Protective Device (SPD)**
1	CTSP4002	**CT SLICKER; SENSATION AND VOLUME ZOOM**
1	CT_PR_AS64X_EO_BON	**AS64 Excel Elevate O Bonus**
1	EZ9900C	**Dual EmpowerCTA w/EDA (ceiling)**
1	CT_INITIAL_32	**Initial onsite training 32 hrs** Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	CT_FOLLOWUP_12	**Follow-up training 12 hrs** Up to (12) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

System Total: $961,831

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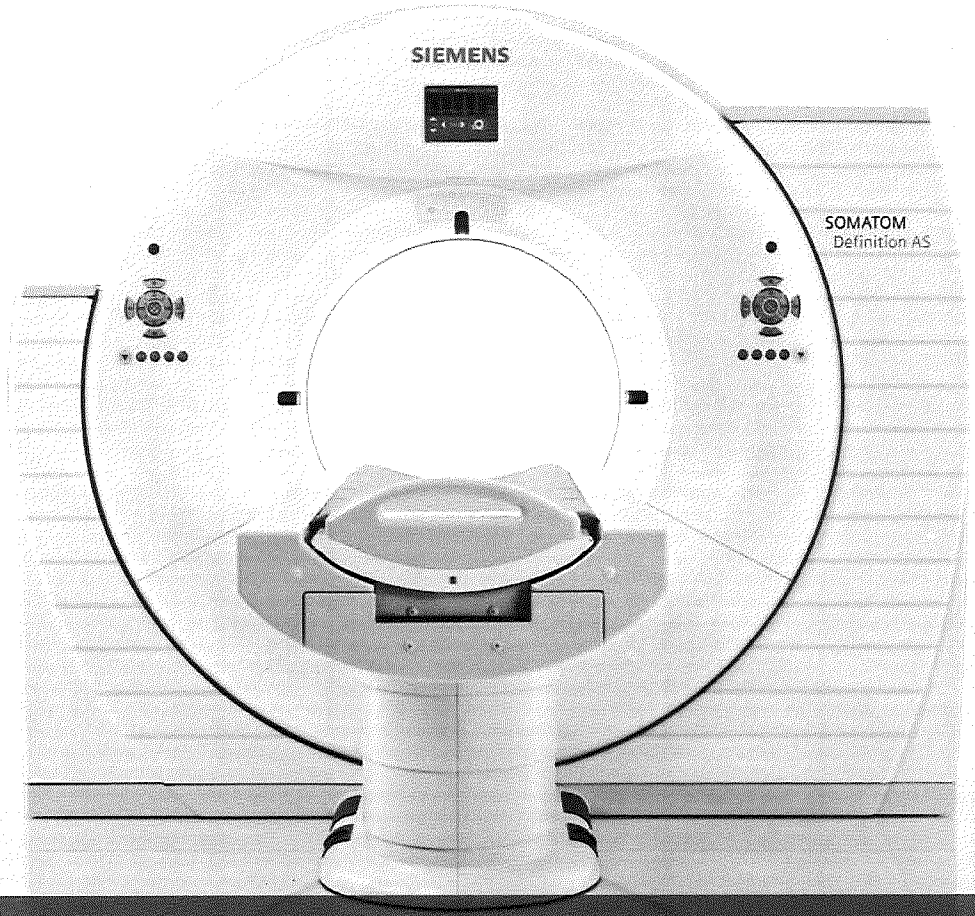

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