



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

ROY COOPER • Governor

MANDY COHEN, MD, MPH • Secretary

MARK PAYNE • Director, Division of Health Service Regulation

February 21, 2019

Elizabeth V. Kirkman
2709 Water Ridge Parkway, Suite 200
Charlotte, NC 28217

Exempt from Review – Replacement Equipment

Record #: 2882
Facility Name: Carolinas Medical Center
FID #: 943070
Business Name: The Charlotte-Mecklenburg Hospital Authority
Business #: 1770
Project Description: Replace and relocate existing CT scanner
County: Mecklenburg

Dear Ms. Kirkman:

The Healthcare Planning and Certificate of Need Section, Division of Health Service Regulation (Agency), determined that based on your letter of February 15, 2019, the above referenced proposal is exempt from certificate of need review in accordance with N.C. Gen. Stat. §131E-184(f). Therefore, you may proceed to acquire without a certificate of need the Siemens SOMATOM Force 128-slice CT scanner to replace the Siemens SOMATOM Definition AS 64-slice CT scanner.

Moreover, you need to contact the Agency's Construction, Radiation Protection, and Acute and Home Care Licensure and Certification Sections to determine if they have any requirements for development of the proposed project.

It should be noted that the 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 office and a separate determination. If you have any questions concerning this matter, please feel free to contact this office.

Sincerely,

Julie M. Faenza
Project Analyst

Martha J. Frisone
Chief, Healthcare Planning and
Certificate of Need Section

cc: Construction Section, DHSR
Radiation Protection Section, DHSR
Acute and Home Care Licensure and Certification Section, DHSR
Melinda Boyette, Administrative Assistant, Healthcare Planning, DHSR

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES • DIVISION OF HEALTH SERVICE REGULATION

HEALTHCARE PLANNING AND CERTIFICATE OF NEED SECTION

LOCATION: 809 Ruggles Drive, Edgerton Building, Raleigh, NC 27603
MAILING ADDRESS: 809 Ruggles Drive, 2704 Mail Service Center, Raleigh, NC 27699-2704
www.ncdhs.gov/dhsr • TEL: 919-855-3873

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER



February 15, 2019

Ms. Martha Frisone, Chief
Healthcare Planning and Certificate of Need Section
Division of Health Service Regulation
N.C. Department of Health & Human Services
809 Ruggles Drive
Raleigh, NC 27603

RE: Exemption Notice to Replace and Relocate CT Scanner Equipment and Relocate an Ultrasound Unit on the campus of The Charlotte-Mecklenburg Hospital Authority d/b/a Carolinas Medical Center

Dear Ms. Frisone:

The Charlotte-Mecklenburg Hospital Authority d/b/a Carolinas Medical Center ("CMC"), seeks to acquire a Siemens SOMATOM Force 128-slice CT scanner ("Replacement Equipment"). Please see Attachment A for a copy of CMC's current hospital license. The Replacement Equipment will replace CMC's current Siemens SOMATOM Definition AS 64-slice CT scanner ("Existing Equipment"). The Existing Equipment is currently housed and in use in CT Room A in the Morehead Medical Plaza ("MMP") Imaging Center on the first level of the MMP building on CMC's main campus located at 1025 Morehead Medical Drive in Charlotte, NC 28203. The Replacement Equipment will be relocated to the imaging suite within the emergency department on the third level of CMC's main hospital building located at 1000 Blythe Boulevard in Charlotte, NC 28203 (see Attachment B).

As part of the project, an existing portable ultrasound unit that is currently housed in an equipment alcove will be relocated to renovated space within the emergency department. Following the completion of the renovations, the portable ultrasound unit will be housed in a dedicated ultrasound room located in the emergency department. This room will be used for ambulatory patients who need ultrasound services instead of utilizing exam rooms for this purpose.

The purpose of this letter is to provide the Agency with notice and to request a determination that CMC's purchase and relocation of the Replacement Equipment and the relocation of the ultrasound unit is exempt from Certificate of Need ("CON") review under the replacement equipment exemption provisions contained in Session Law 2013-360, Section 12G.3(b) and Session Law 2013-363, Section 4.6 (which are codified at N.C. Gen. Stat. 131E-184(f)(1)-(3)).

The North Carolina Certificate of Need statutes provide a definition of replacement equipment in N.C.G.S. 131E-176(22a). The definition requires the replacement equipment be comparable to the existing medical equipment and costs less than \$2,000,000 when installed.

Under the new provisions found at N.C. Gen. Stat. 131E-184(f)(1)-(3), the CON law provides:

- (f) The Department shall exempt from certificate of need review the purchase of any replacement equipment that exceeds the two million dollar (\$2,000,000) threshold set forth in G.S. 131E-176(22) if all of the following conditions are met:
 - (1) The equipment being replaced is located on the main campus.
 - (2) The Department has previously issued a certificate of need for the equipment being replaced. This subdivision does not apply if a certificate of need was not required at the time the equipment being replaced was initially purchased by the licensed health service facility.
 - (3) The licensed health service facility proposing to purchase the replacement equipment shall provide prior written notice to the Department, along with supporting documentation to demonstrate that it meets the exemption criteria of this subsection.

See Session Law 2013-360, Section 12G.3(b) and Session Law 2013-363, Section 4.6. The term "main campus" was defined in Session Law 2013-360, Section 13G.3(a) (codified N.C. Gen. Stat. 131E-176(14n)) as follows:

- (14n) "Main campus" means all of the following for the purposes of G.S. 131E-184(f) and (g) only:
 - a. The site of the main building from which a licensed health service facility provides clinical patient services and exercises financial and administrative control over the entire facility, including the buildings and grounds adjacent to that main building.
 - b. Other areas and structures that are not strictly contiguous to the main building but are located within 250 yards of the main building.

The Existing Equipment is currently located in CT Room A in the MMP Imaging Center on the first level of the MMP building on CMC's main campus. The Replacement Equipment will be relocated to the imaging suite within the emergency department on the third level of CMC's main hospital building. The main hospital building from which Carolinas Medical Center exercises financial and administrative control over Carolinas Medical Center services is located at 1000 Blythe Boulevard, Charlotte, NC 28203 (see Attachment B). Carolinas Medical Center's President's office is located on the second floor of the main hospital building.

In addition to the foregoing, CMC's proposal qualifies for this exemption based on the following information:

A. Cost of the Replacement Equipment

The purchase price of the Replacement Equipment is \$2,133,077 (\$1,930,000 CT + \$17,695 Freight + \$139,925 Tax). The purchase price of the Injector is \$45,457 (\$41,664 Injector + \$669 Freight + \$3,124 Tax). Quotes for the CT scanner and Injector from Siemens are provided in Attachment C. The projected total capital cost of the project is \$6,062,606 and includes the cost to acquire, install and make operational the Replacement Equipment and to relocate the ultrasound unit to renovated space. The total capital cost schedule is provided in Attachment D.

B. Equipment Being Replaced is Located on the Main Campus

The Existing Equipment is currently located in CT Room A in the MMP Imaging Center on the first level of the MMP building on CMC's main campus. The Replacement Equipment will be relocated to the imaging suite within the emergency department on the third level of CMC's main hospital building (see Attachment B).

C. Certificate of Need Issued for Equipment Being Replaced

This proposal also fits within the exemption criterion in Section 131E-184(f)(2) because the Agency confirmed a letter of no review to develop the MMP Imaging Center in 2006 (see Attachment E). The Existing Equipment was replaced in 2012, but the cost of the replacement equipment was less than \$750,000 and did not trigger the CON reviewability threshold for "major medical equipment" under N.C.G.S 131E-176(14o). A copy of the purchase order is included in Attachment F.

D. Comparable Equipment

The CON rule codified as 10A N.C.A.C. 14C.0303 (the "Regulation") defines "comparable medical equipment" in subsection (c) as follows:

"Comparable medical equipment" means equipment which is functionally similar and which is used for the same diagnostic or treatment purposes.

CMC intends to use the Replacement Equipment for substantially the same CT procedures for which it currently uses the Existing Equipment. The Existing Equipment is a Siemens SOMATOM Definition AS 64-slice CT scanner that was installed new in 2012. This Existing Equipment has been used for CT procedures since installation.

The Replacement Equipment will perform all procedures currently performed on the Existing Equipment. Although it possesses some expanded capabilities due to technological improvements, the Replacement Equipment will perform the same CT procedures (see Attachment G for the Equipment Brochure). The Replacement Equipment is therefore "comparable medical equipment" as defined in Subsection (c).

Furthermore, CMC does not intend to increase patient charges or per procedure operating expenses within the first 12 months after equipment acquisition. For further equipment comparison, please refer to Attachment H, the Equipment Comparison Chart.

Subsection (d) of the regulation further provides:

- (1) it has the same technology as the equipment currently in use, although it may possess expanded capabilities due to technological improvements; and
- (2) it is functionally similar and is used for the same diagnostic or treatment purposes as the equipment currently in use and is not used to provide a new health service; and
- (3) the acquisition of the equipment does not result in more than a 10.0 percent increase in patient charges or per procedure operating expenses within the first twelve months after the replacement equipment is acquired.

The Replacement Equipment will meet all three of the tests set out in Subsection (d). The Replacement Equipment satisfies the technology and functionality tests in Subsection (1) and (2) as discussed above and identified in the Comparison Chart (Attachment H). Moreover, CMC represents the use of the Replacement Equipment will not result in the types of expense or charge increases described in Subsection (d)(3).

The Existing Equipment is currently in use and documentation provided in Attachment I indicates that 7,712 procedures from November 2017 through October 2018.

E. Existing Equipment

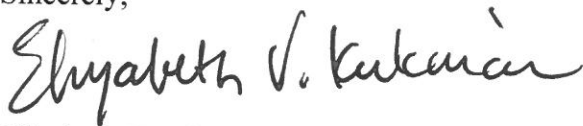
The Existing Equipment located in CT Room A in the MMP Imaging Center on the first level of the MMP building on CMC's main campus has a maximum fair market value (FMV) of \$441,694 (see Attachment J for FMV analysis – the information pertaining to the Existing Equipment is outlined in red). CMC proposes to retain the Existing Equipment. Since the FMV of the existing equipment is less than \$750,000, it does not trigger the CON reviewability threshold for "major medical equipment" under N.C.G.S 131E-176(14o). The Existing Equipment will remain in its current location in CT Room A and will continue to be used for all primary CT applications.

CONCLUSION:

Based on the foregoing information, CMC hereby requests that the Agency provide a written response confirming that the acquisition and relocation of the Replacement Equipment, the relocation of the ultrasound unit, and the retention of the Existing Equipment described herein is exempt from CON review. If the Agency needs additional information to assist in its consideration of this request, please contact me at 704-446-8475.

Thank you for your consideration of this notice.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth V. Kirkman". The signature is written in a cursive style with a large initial 'E' and a distinct 'V'.

Elizabeth V. Kirkman
Assistant Vice President
Atrium Health Strategic Services Group

Attachments

cc: Christopher Bowe, President, Carolinas Medical Center

Attachment A

State of North Carolina

Department of Health and Human Services
Division of Health Service Regulation

*Effective October 11, 2018, this license is issued to
The Charlotte-Mecklenburg Hospital Authority*

*to operate a hospital known as
Carolinas Medical Center/Center for Mental Health
located in Charlotte, North Carolina, Mecklenburg County.*

*This license is issued subject to the statutes of the
State of North Carolina, is not transferable and shall remain
in effect until amended by the issuing agency.*

Facility ID: 943070

License Number: H0071

Bed Capacity: 1211

General Acute 1055, Rehabilitation 13, Psych 132, Substance Abuse 11,

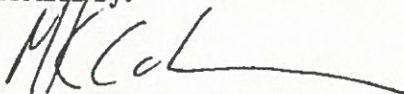
Dedicated Inpatient Surgical Operating Rooms: 10

Dedicated Ambulatory Surgical Operating Rooms: 11

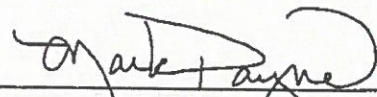
Shared Surgical Operating Rooms: 41

Dedicated Endoscopy Rooms: 12

Authorized by:



Secretary, N.C. Department of Health and
Human Services



Director, Division of Health Service Regulation

Attachment B

COLOR KEY



RENOVATION



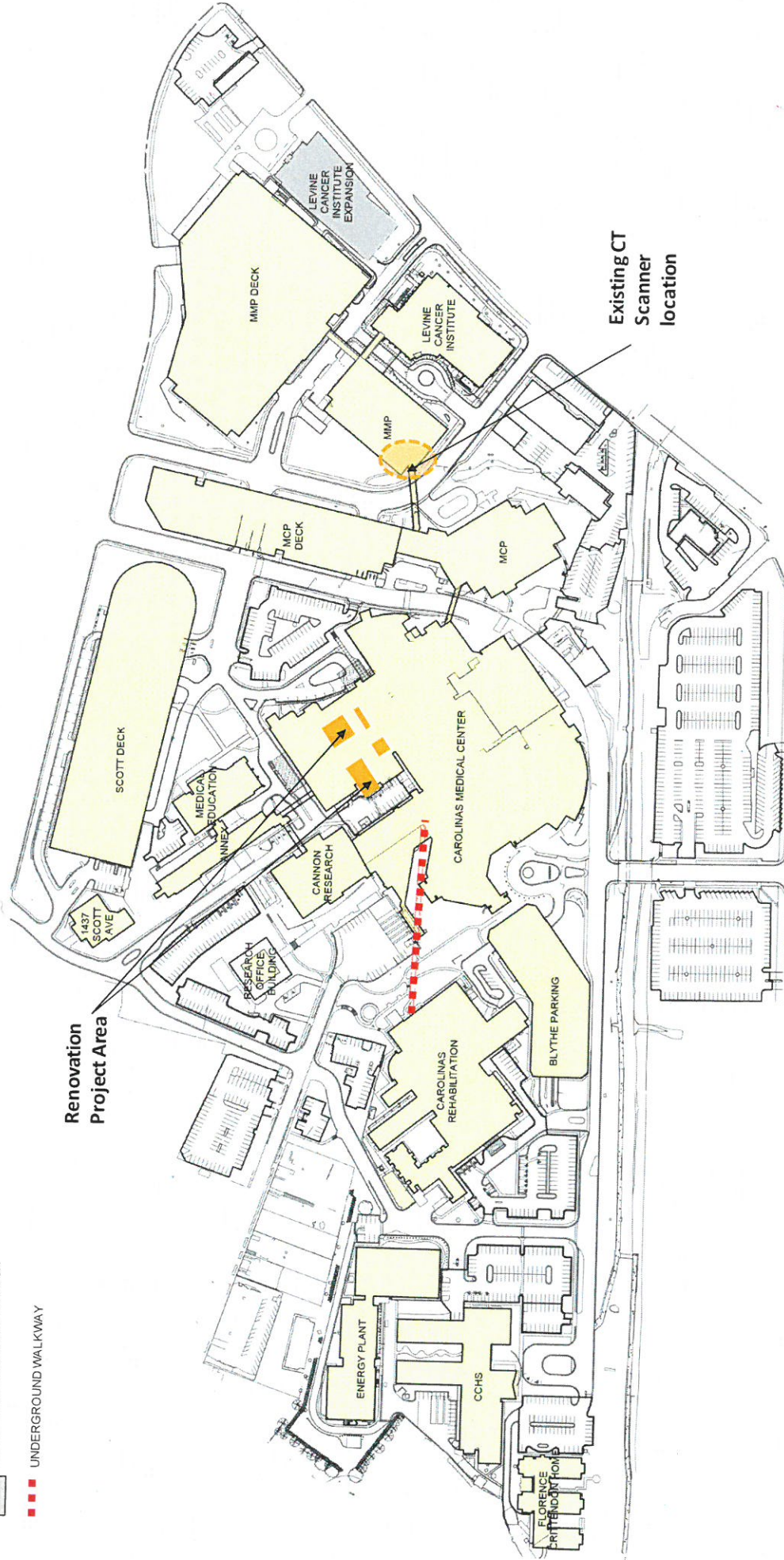
EXISTING BUILDING



PROJECT UNDER CONSTRUCTION



UNDERGROUND WALKWAY



SITE PLAN

Atrium Health

Emergency Department CT Replacement and Relocation

Carolinas Medical Center

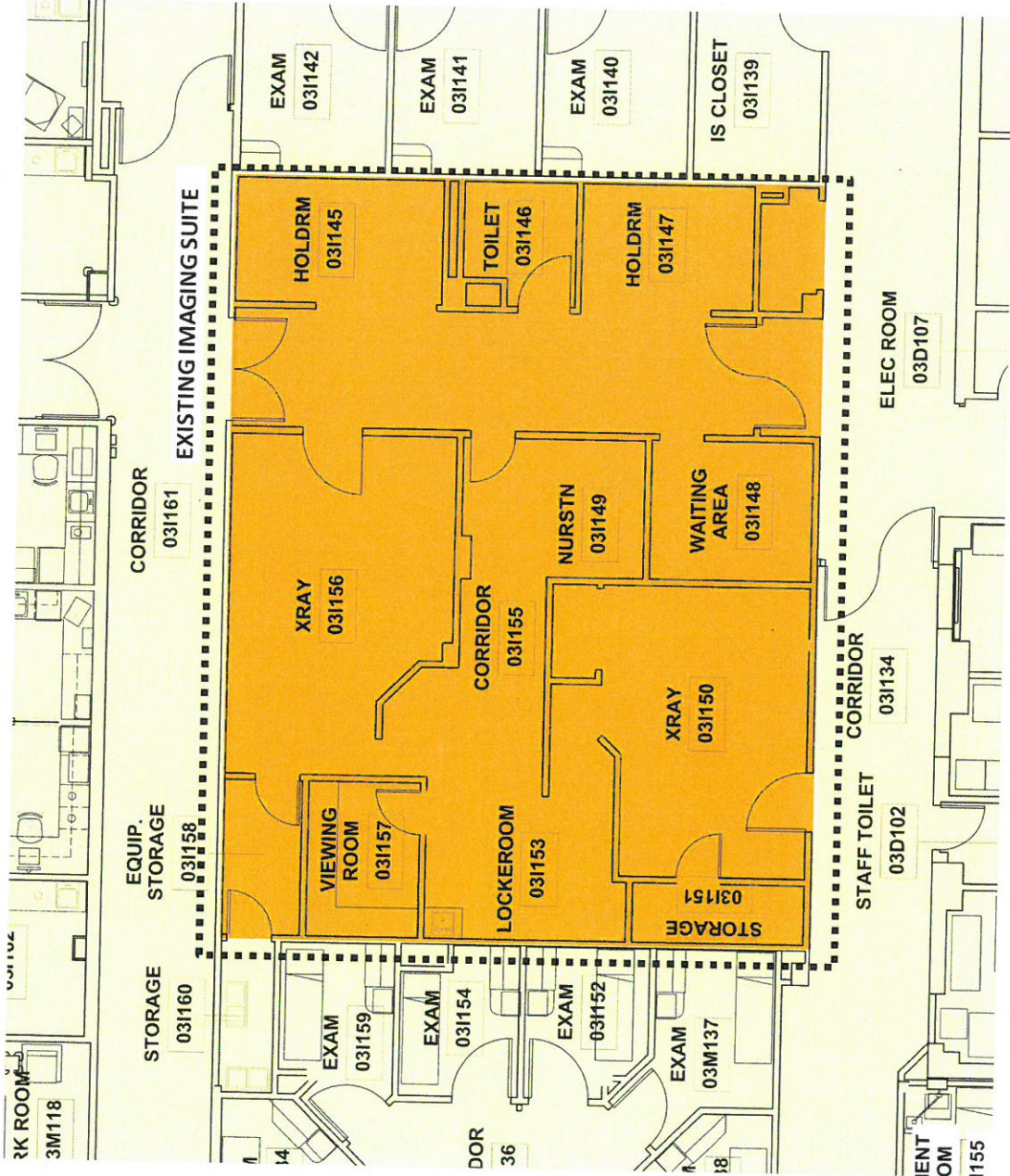
02/12/2019



COLOR KEY

RENOVATION

EXISTING BUILDING



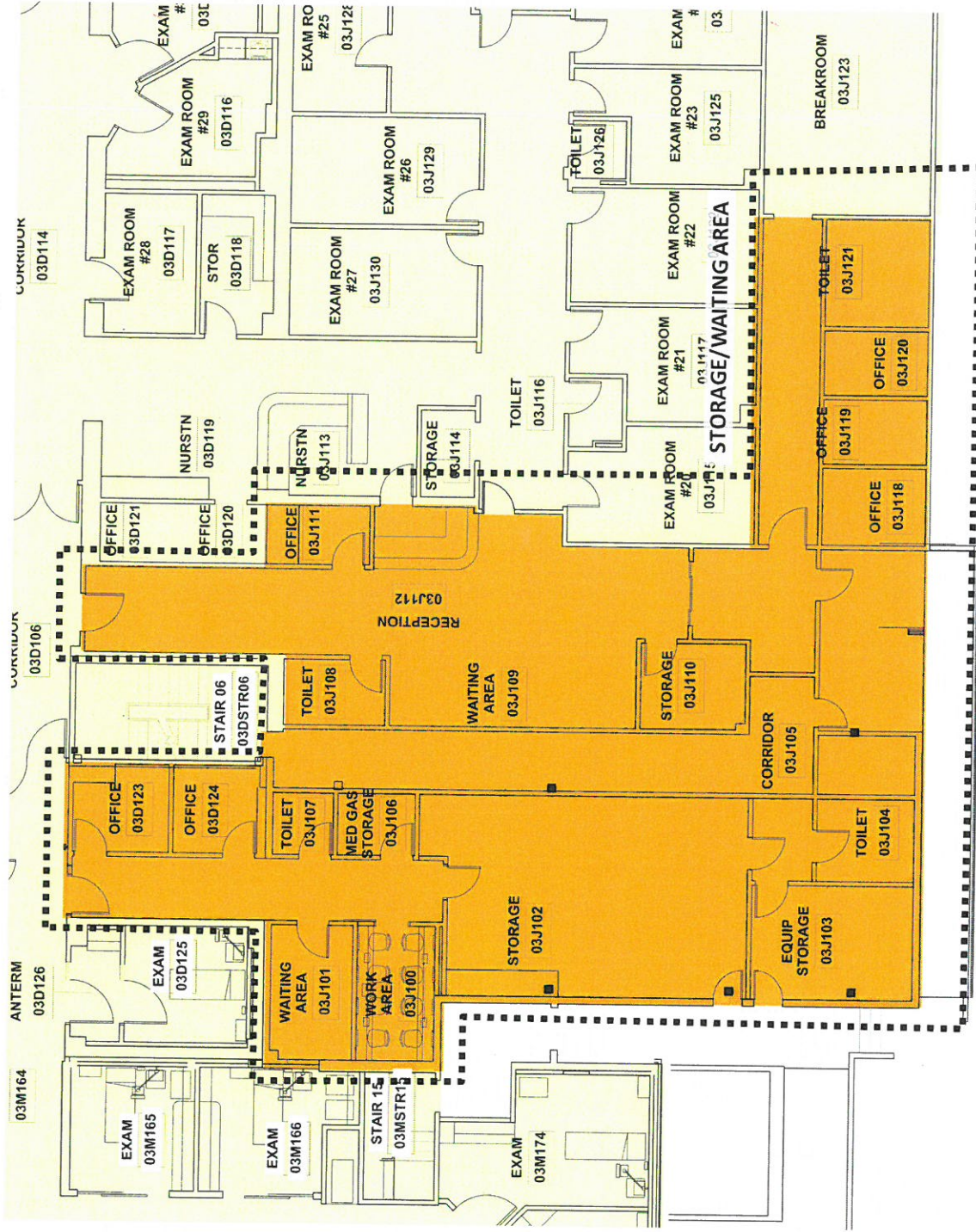
EXISTING LEVEL 03 PLAN

Emergency Department CT Replacement and Relocation



COLOR KEY

- RENOVATION
- EXISTING BUILDING



EXISTING LEVEL 03 PLAN

Atrium Health

Emergency Department CT Replacement and Relocation

Carolinas Medical Center

02/12/2019



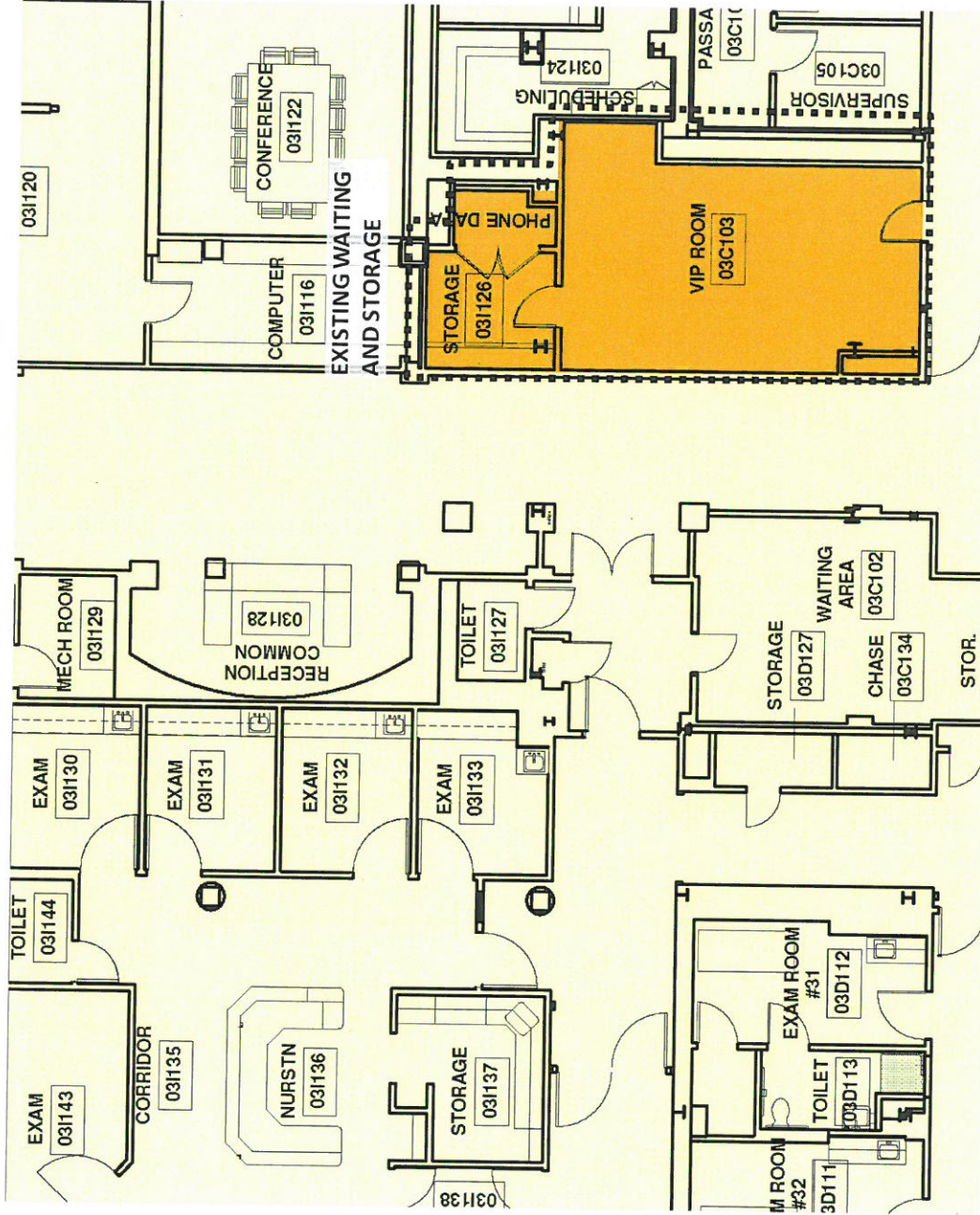
COLOR KEY



RENOVATION



EXISTING BUILDING



EXISTING LEVEL 03 PLAN

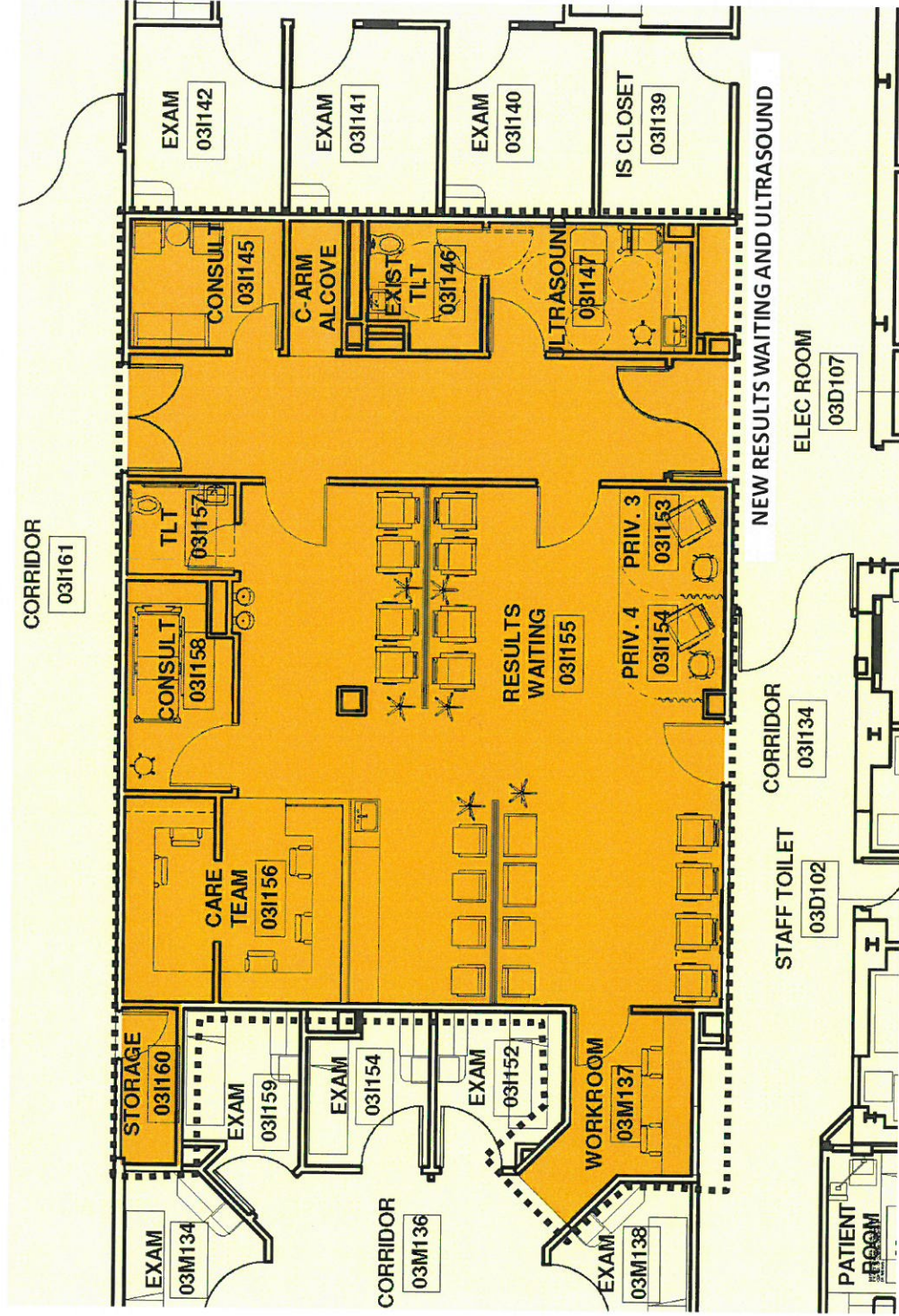
Emergency Department CT Replacement and Relocation



COLOR KEY

RENOVATION

EXISTING BUILDING



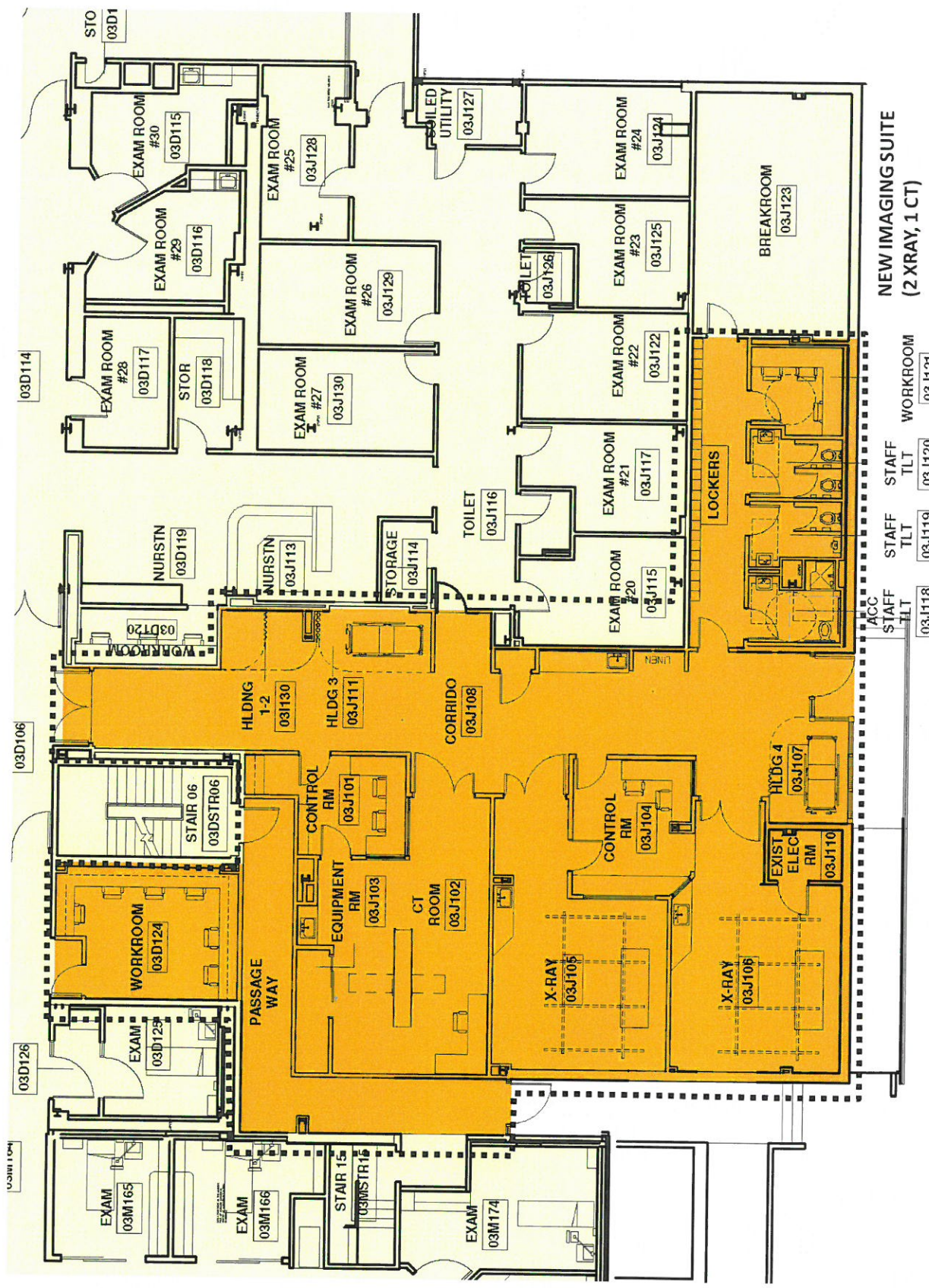
PROPOSED RESULTS WAITING AND ULTRASOUND AREA -
LEVEL 03 PLAN

Emergency Department CT Replacement and Relocation



COLOR KEY

- RENOVATION
- EXISTING BUILDING



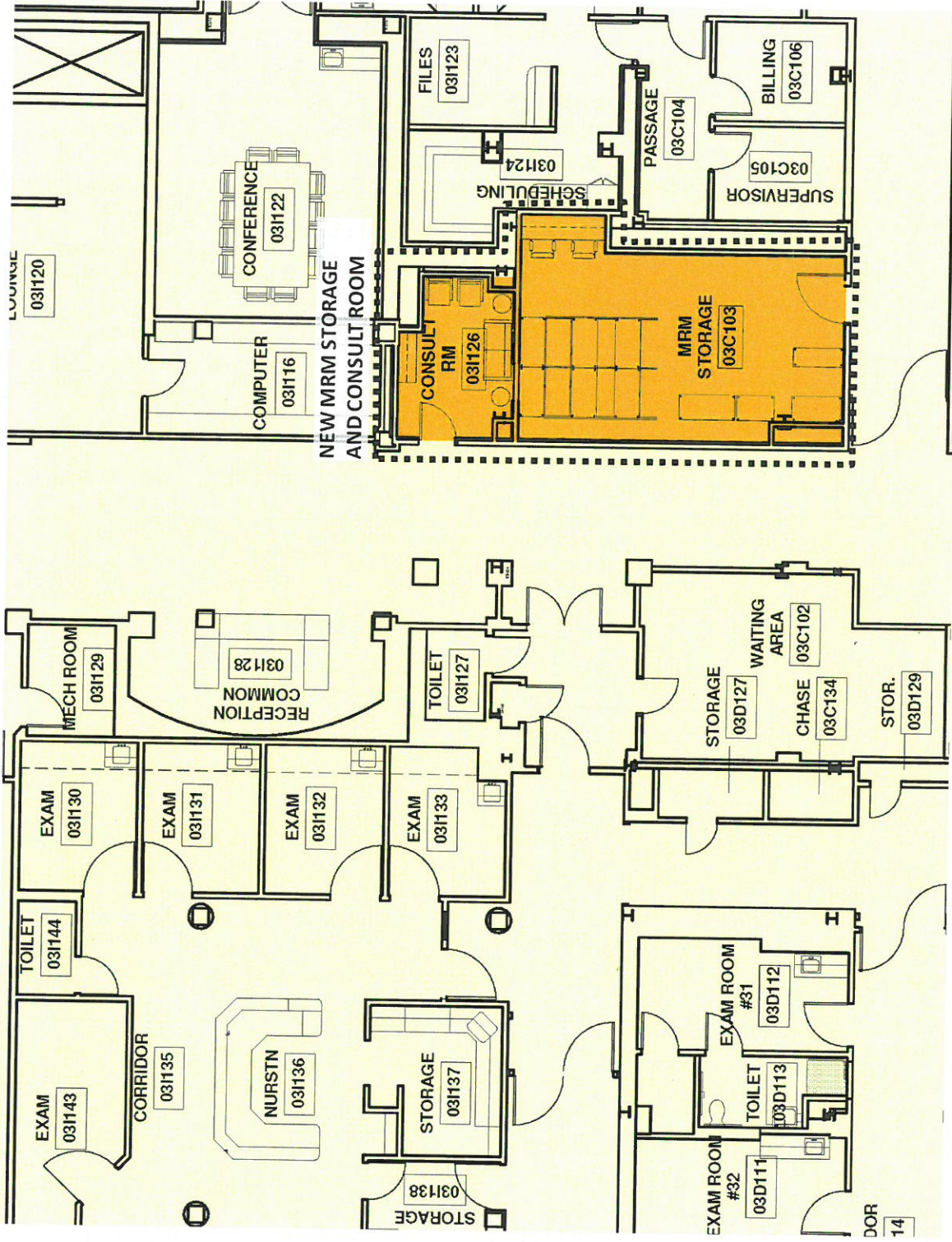
PROPOSED IMAGING SUITE - LEVEL 03 PLAN

Emergency Department CT Replacement and Relocation



COLOR KEY

- RENOVATION
- EXISTING BUILDING



**PROPOSED MRM STORAGE AND CONSULT ROOM -
LEVEL 03 PLAN**

Emergency Department CT Replacement and Relocation



Attachment C

Siemens Medical Solutions USA, Inc.
 40 Liberty Boulevard, Malvern, PA 19355
 Fax: (336) 856-9995



SIEMENS REPRESENTATIVE
 Edwin Winicki - (336) 688-0978

Customer Number: 0000035965

Date: 12/29/2018

ATRIUM HEALTH
 1000 BLYTHE BLVD
 CHARLOTTE, NC 28203-5812

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.

Quote Nr:	1-KQR89E Rev. 0
Trade:	N/A – no trade
Terms of Payment	00% Down, 80% Delivery, 20% Installation
Purchasing Agreement	Free On Board: Destination Premier Purchasing Partners
Terms and Conditions	Premier terms and conditions apply
Proposal Valid Until	3/29/2019

Siemens Somatom Force for CMC-Main Emergency Department

Qty	Part No.	Item Description
1	14460675	<p>SOMATOM Force</p> <p>The all new SOMATOM Force contains two Vectron X-ray tubes with unprecedented tube current (2 x 1,300 mA) and generator power (2 x 120 kW). The StellarInfinity detector, including TrueSignal and Edge Technology provides increased in plane resolution (1,840 channels) and ~ 50% increased z-coverage, compared to SOMATOM Definition Flash. SOMATOM Force takes CT imaging where it has never gone before by routinely generating ultra-thin 0.5 mm slices e.g. for most accurate stenosis, plaque and stent analysis and for low-kV imaging without compromises, even in adults or obese patients at scan speeds up to 737 mm/s (opt.). Additionally, the all new measurement system sets the benchmark in low contrast detectability. An object size of 2 mm, at a contrast difference of 3 HU, with a CT DIvol (Ø 32 cm) of only 12.3 mGy (with Phantom CATPHan (20 cm)) can be detected.</p> <p>The all new SOMATOM Force gantry, with its powerful hollow shaft motor achieves maximum rotation speeds of up to 0.25 seconds (opt.) resulting in 66 ms temporal resolution, enabling you to freeze motion independent of heart rate. It features the industry leading Turbo Flash mode, with a dynamic Field of View (FoV) of up to 50 cm, even in ultra-high pitch applications (up to 737 mm/s table speeds, Opt.).</p> <p>Besides, it enables reduction in dose, while it improves overall image quality (both high- and low-contrast resolution) for all scans, resulting, e.g. in dose down to sub-mSv for cardiac imaging and below. In its third generation, Dual Energy with Selective Photon Shield II (~ 30% better energy separation, for more precise Dual Energy quantification), automatically provides a second contrast for the best possible diagnosis without any extra dose at a Dual Energy Field of View (FoV) of up to 35 cm at scan speeds up to 285 mm/s (opt.).</p>

Qty	Part No.	Item Description
1	14460770	<p>FAST Integrated Workflow</p> <p>We combine our market leading applications to make positioning simple for our customers.</p> <p>The world's first 3D camera integrated into a CT positioning workflow is available as an option and allows automatic patient positioning in the examination room.</p> <p>The FAST 3D camera captures the patient's shape, position, and height in three dimensions.</p> <p>Using infrared measurement, it even recognizes body contours: for example, when people are wearing heavy clothes or blankets.</p> <p>Specialized applications support accurate and reproducible positioning:</p> <p>FAST Isocentering, at the push of a button, provides the correct isocenter position, enabling the right dose modulation and consistent images.</p> <p>FAST Range supports scanning the correct body region in the topogram with no cut-off - by aligning the automatically identified anatomical position with the protocol.</p> <p>FAST Direction helps safeguard the right scan direction of the topogram, which is crucial when moving the table with infused patients.</p> <p>FAST Topo - enables faster scan speeds in topograms, which minimizes breath-hold artifacts. It also has the potential to decrease the topogram dose.</p> <p>FAST Planning - assists scan and reconstruction planning, based on a topogram, to provide an easier, faster and standardized workflow in CT scanning.</p> <p>FAST 3D Align - automatically corrects misalignment of anatomic structures, organs of the patient. It aligns those to fit it to the selected reconstruction plane for a highly automated reconstruction workflow. Additionally, it minimizes the black area in the image by automatically adjusting the recon field of view selection.</p>
1	14460678	<p>Force Imaging</p> <p>We combine our market leading applications to make this the most personalised scanner for our customers. Including SureView, Turbo Flash Spiral, Adaptive Dose Shield, CARE Dose 4D, CARE kV, CARE Child, CARE Profile, CARE Dashboard, CARE Bolus, Dose MAP, FAST Adjust</p>
1	14460679	<p>Force Imaging - Advanced</p> <p>The Imaging Advanced Package combines ADMIRE, X-CARE and CARE Contrast to bring imaging to the next level.</p>
1	14460676	<p>High-speed 0.25 s rotation</p> <p>High-speed 0.25 s rotation</p>
1	14460680	<p>Force Reading</p> <p>We combine our market leading applications to make reporting consistent, fast and simple for our customers. Includes VRT, Workstream 4D and Extended FoV.</p>
1	14460681	<p>Force Reading - Advanced</p> <p>We combine our advanced applications to make reporting of complex and atypical anatomical structures faster and simpler.</p> <p>Includes:</p> <p>iMAR for anatomically driven metal artifact reduction, combining three successful approaches (beam hardening correction, normalized sinogram inpainting and frequency splitting). This reduces artifacts caused by metal implants.</p> <p>FAST Spine, providing anatomically aligned preparation of spine recons with just a single click.</p> <p>HD FoV, special reconstruction algorithms allow for visualization of objects using a FoV up to 65 cm with an image quality suited for radiation therapy planning</p> <p>UHR mode, with the wide large UHR-Comb, delivers Ultra High resolution in plane of up to 32lp/cm (0.16 mm) for high defined imaging of small structures such as inner ear or even the lung, joints or fractures of the bone. The UHR Collimation could be increased to 32 x 0.6 mm collimation.</p>
1	14460683	<p>Force Function - DE</p> <p>The syngo Dual Energy Scan with Tin Filter option allows the use of both SOMATOM Force X-ray sources simultaneously at different energies, while the Tin Filter reduces dose and at the same time increases energy separation by blocking unnecessary parts of the energy spectrum. syngo Dual Energy offers the possibility to acquire two spiral data sets simultaneously from a single scan running the tubes at 80/Sn150 kV, 90/Sn150 kV and 100/Sn150 kV (for obese Dual Energy imaging). The results are two data sets with diverse information.</p>

Qty	Part No.	Item Description
1	14460684	Force Function - Cardiac Cardiac scanning options to enable a simple to use, routine cardiac CTA and calcium scoring workflows. Includes: Heart View, Cardio Best Phase Plus, syngo Calcium Scoring CT and FAST Phase.
1	14460685	Force Function - Dynamic Adaptive 4D Spiral - a unique 4D Spiral scan mode that enables the SOMATOM Force to extend beyond restraints experienced when utilizing a static detector and allows for up to 80 cm dynamic CT coverage. This enables use not only in perfusion but also for advanced 4D CT DSA evaluations. Tilttable head holder for optimal positioning of stroke patients.
1	14406461	syngo Expert-I #AWP Expert-i enables the physician to interact with the syngo CT Workplace from virtually anywhere in your hospital.
1	14460677	FAST IRS Reconstruction computer for the preprocessing and reconstruction of the CT raw data. The reconstruction computer contains of a cluster of high-performance GPU boards performing the preprocessing and reconstruction of the CT data.
1	14449417	Multi-purpose table The Multi-Purpose table is especially designed for multi-disciplinary use, while still enabling ultra-fast spiral scanning (up to 737 mm/s with HeartView in Turbo Flash spiral). Its flexible design allows exchanging table tops for routine radiology, trauma or bariatric use.
1	14410230	Mat for MPT Standard Table Top Replacement for the positioning mattress for Standard Multi Purpose Table Top
1	14408231	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	14408232	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	14414739	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	14460772	Ring Light SOMATOM Force offers a gantry ring mood light (LED) in different, preset, adjustable colors that are synchronized with the gantry tunnel light. They help create a relaxing atmosphere for your patients, making a SOMATOM Force examination even more exciting and memorable.
1	14460771	Tunnel Light SOMATOM Force offers a tunnel mood light (LED) in different, preset, adjustable colors that are synchronized with the gantry ring light. It makes the gantry bore appear wider thus making it easier for patients with claustrophobia to undergo their examination.
1	SURE_VIEW	SureView Provides exceptional image quality at any pitch setting, enabling you to scan faster because you can scan at any pitch without degrading image quality
1	UFC_DETECT OR	UFC Detector Ultra Fast Ceramics (UFC) technology is a unique type of scintillation technology material that quickly and efficiently transforms radiation from the X-ray tube into light signals. Its superb overall quantum efficiency and unique short afterglow enable time-critical X-ray detection at low doses and extremely fast data collection.
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

Qty	Part No.	Item Description
1	FAST_SCAN_ASSIST	<p>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.</p> <p>FAST Scan Assistant</p> <p>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.</p>
1	ADAPT_DOSE_SHIELD	<p>Adaptive Dose Shield</p> <p>Adaptive Dose Shield for spiral acquisition to eliminate pre- and post-spiral over-radiation.</p>
1	CARE_DOSE4D	<p>CARE Dose4D</p> <p>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</p>
1	CARE_KV	<p>CARE kV</p> <p>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%.</p>
1	CARE_PROFILE	<p>CARE Profile</p> <p>CARE Profile: Visualization of the dose distribution along the topogram prior to the scan</p>
1	NEURO_BEST_CONTRAST	<p>Neuro BestContrast</p> <p>The Neuro BestContrast algorithm can provide enhanced tissue contrast, resulting in improved contrast between gray and white matter without increasing image noise. This post processing step is rapid and can be easily incorporated into clinical workflow where it can be used with other dose reduction approaches such as iterative reconstruction.</p>
1	ACCESS_PROTECT	<p>Access Protection</p> <p>Scan Protocols are password protected allowing only authorized staff members to access and permanently change protocols</p>
1	NEMA_XR-29	<p>NEMA_XR-29 Standard</p> <p>This system is in compliance with NEMA XR-29 Standard Attributes on CT Equipment Related to Dose Optimization and Management, also known as Smart Dose.</p>
1	CT_UPS_FORCE	<p>Standard UPS for Force</p> <p>The standard partial system uninterruptible power system (UPS) is built directly into the power distribution cabinet (PDC) and supports the critical circuits for table and gantry electronics, console computer, image reconstruction system, and the internal Ethernet switch (to ensure connectivity). This enables safe removal of patient if outage occurs during scanning.</p> <p>The UPS allows for a safe shutdown of the CT scanner in the event of power interruption. The UPS provides 5-7 minutes of power, during which the user is prompted and guided through the process to perform a safe shutdown of the system. This safe shutdown ensures that no data is lost.</p>
1	CT_PM	<p>CT Project Management</p> <p>A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemens 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.</p>
1	CT_ADDL_RIGGING	<p>Additional Rigging CT</p>
1	CT_STD_RIGGING_INSTALL	<p>CT Standard Rigging and Installation</p> <p>This quotation includes standard rigging and installation of your CT new system.</p> <p>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.)</p> <p>It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents.</p> <p>Any special rigging requirements (Crane, stairs, etc.) and/or special site requirements (e.g. removal of existing</p>

Siemens Medical Solutions USA, Inc.
 40 Liberty Boulevard, Malvern, PA 19355
 Fax: (336) 856-9995



SIEMENS REPRESENTATIVE
 Edwin Winicki - (336) 688-0978

Qty	Part No.	Item Description
		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	4SPAS014 PSPD250480Y	Low Contrast CT Phantom & Holder
1	3K	Surge Protective Device (SPD)
1	CTSP4002	CT Slicker Thermoseal seams and flaps deflect fluids, reducing contaminant penetration into the cushion and table. Contaminants are retained on the tabletop or shunted to the floor. Cleanup is faster, more thorough, and contaminant build-up is reduced. Built using heavy, clear, micro matte vinyl, and top grade hook and loop fastening strips (Velcro) to better fit the specified table. Custom vinyl resists tears and minimizes radiologic interference. Latex free. Set includes CT Skirts. Includes warranty from RADSCAN Medical.
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	SY_PR_TEAM PLAY	teampay Welcome & Registration Package teampay is a cloud-based network that brings together your imaging modality users, the systems' dose and utilization data, and the users' expertise to help you improve the delivery of care to your patients. Basic features are provided free of charge. Premium features (benchmarking, non-Siemens devices) are provided on a trial basis for three months at no charge, and may be used thereafter on a subscription fee basis. To register: http://teampay.siemens.com/#/institutionRegistration/1

Sell Price (excluding freight) : \$1,912,305
Freight and Rigging : \$17,695
Final Price : \$1,930,000

Estimated Tax (final tax is computed at time of installation) : \$139,925

Quotation

Quote No. Q-00019916

Sales Support
tel (800) 633-7231
fax (412) 406-0952
radiologysolutions.bayer.com

Bayer HealthCare LLC
1 Bayer Drive
Indianola, PA 15051



This quotation has been prepared for: Carolinas Healthcare

System Issued on 7/27/2018

Valid until 5/27/2019

Trade-in required No

Your Bayer Sales Team:

Harold Karn, Senior Professional Sales Consultant, trey.karn@bayer.com

Quotation Overview

PREMIER RADIOLOGY T7 & T8 Pricing Applied

Bayer's diagnostic imaging products, software, and equipment service help healthcare teams in radiology address their critical performance, quality, uptime, and scheduling requirements.

Please note: If pricing and terms of this [order/quote] are based upon your current Group Purchasing Organization (GPO) affiliation, any change to your current affiliation may require a new quote or updated terms and pricing.

>See Products and Services Details in this quote for an itemized breakdown of quoted products.

Imaging Products and Services

Product Name	Total List Price	Total Discounts	YOUR PRICE
Contrast Dose Management (CDM) and Related Products/Services			\$9,220.00
Stellant - Medrad® Stellant® Injection System(s)			\$32,444.20
TOTAL (Local taxes, shipping and/or handling to be invoiced when applicable)			\$41,664.20

TOTAL	\$41,664.20
--------------	--------------------

GRAND TOTAL (Local taxes, shipping and/or handling to be invoiced when applicable)	\$41,664.20
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If your organization is tax exempt, please notify Sales Support at 1-800-633-7231.

Quotation continued



Quotation prepared for: Carolinas Healthcare System

Issued on 7/27/2018

Valid until 5/27/2019

This quotation has been prepared for: Carolinas Healthcare

System Issued on 7/27/2018

Valid until 5/27/2019

Trade-in required No

Your Bayer Sales Team:

Harold Karn, Senior Professional Sales Consultant, trey.karn@bayer.com

If you are using this quote as a purchase order, please complete the Acceptance and Billing information below:

Acceptance and Billing

Your signature below indicates your acceptance of this Agreement, including the terms and conditions included as part of this document. Please complete the information below, along with your Purchase Order referencing Quote # Q-00019916, and email this form to Sales Support at risalesupport@bayer.com AND your SC, Harold Karn, at trey.karn@bayer.com.

If pricing and terms of this order are based on your current Group Purchasing Organization (GPO) affiliation, any change to your current affiliation may require a new quote or updated terms and pricing.

Payment terms

30 days due net

Terms of Delivery

PITTSBURGH

Customer contact

Chris Hollar

Address

1000 Blythe Blvd
Charlotte, NC 28203

Billing Information

1000 Blythe Blvd
Charlotte, NC 28203

Customer Number

3827302

Phone

7045127247

Additional Customer Comments

[Redacted area]

PO#

Write PO number

PO Amount

Write PO amount

Customer Approver

Write customer name

Customer Approver Title

Write customer title

Billing Email Address (if applicable)

Write email address

Customer Approver Signature

X

Date

Please print and sign

MM/DD/YYYY

BAYER, the Bayer Cross, Certegra, P3T, Medrad, Stellant, XDS, Veris, Spectris Solaris, Spectris, DirectCARE, PartnerCARE, VirtualCare, SelectCARE, Mark 7 Arterion, and Mark V ProVis are registered trademarks of the Bayer group of companies. Radimetrics, MRXperion, Avanta, Twist & Go, and VFlow are trademarks of the Bayer group of companies.

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Bayer Product Terms and Conditions

GROUP PURCHASING AGREEMENT

If Customer is a member of a group purchasing organization ("GPO") who has a contract with Bayer, the terms of that GPO Agreement will supersede the terms herein.

The following terms and conditions will not apply to the license of Bayer's Informatics Software. Both Radiation Dose Management software (sometimes referred to as "RDM") and Contrast Dose Management (sometimes referred to as "CDM") software are subject to a separate license agreement.

ACCEPTANCE

Bayer's products and services are sold only under the terms and conditions stated on this quotation. Acceptance of any Purchase Order is expressly and exclusively made conditional on your assent to these terms and conditions. Any different or additional terms and conditions that may appear in your Purchase Order or any other document sent by you, shall have no effect. Bayer expressly objects to and rejects all inconsistent or additional terms, conditions and limitations contained on any of your forms or other writings. If you do not communicate your objection to these terms and conditions in writing and within a reasonable time, or if you accept the goods covered by this Quote, you will be deemed to have accepted these terms and conditions and they will control in all instances. If the Products include embedded software or if you are purchasing software, BY HAVING THE SOFTWARE INSTALLED AND USING THE SOFTWARE PURCHASED HEREUNDER, YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THE TERMS OF THIS QUOTE, DO NOT INSTALL OR USE THE SOFTWARE AND NOTIFY BAYER IMMEDIATELY.

PRICING

Prices are based on costs and conditions existing on the date of this Quote and may be changed by Bayer before final acceptance. The pricing for products and services provided pursuant to this Quote may reflect or be subject to discounts, rebates, or other price reduction programs. Please be advised that you are obligated to: a) fully and accurately disclose the amount of any such discounts, rebates, or other price reductions in your cost reports or claims for reimbursement to Medicare, Medicaid, or health care programs requiring such disclosure and b) provide such documentation to representatives of the Secretary of the Department of Health and Human Services and state agencies upon request. Unless noted otherwise, the value of any product listed as \$0.00 on this Quote may constitute a discount that you should evaluate when filing such reports. You may request additional information from Bayer in order to meet your reporting or disclosure obligations, by writing to the address set forth in this Quote.

All payments are due net thirty (30) days on the total invoiced amount. For all new customers Bayer requires a thirty percent

(30%) pre-payment for all capital equipment orders, unless otherwise agreed to by Bayer. Bayer must approve any payment terms other than net thirty (30) days.

SHIPPING

All shipping dates are tentative. Bayer will make every reasonable effort to meet shipping dates referenced in this Quote. However, Bayer will not be liable for its failure to meet any such date.

INSTALLATION

The cost of installation is not included in the product price and is your responsibility unless otherwise stated. For details on equipment installation, you should consult with your Bayer Sales Representative or refer to your Products Manual, which is included with your equipment.

If this Quote includes installation of an overhead counterpoise system (OCS) it is your responsibility to ensure a suitable mounting location for the system. The counterpoise ceiling plate is required to be installed prior to Bayer installation of the counterpoise system and installed in accordance with the specifications listed in the installation manual. The OCS ceiling plate should always be installed by a qualified Structural Engineer and/or Architect. In addition, if applicable building codes require the use of a conduit, you are responsible for ensuring that a conduit is available prior to Bayer's installation.

If this Quote includes a Spectris Solaris with an Integrated Continuous Battery Charging System (iCBC), installation will require a standard power outlet in the scan room, or authorization to install a filter through the penetration panel.

LICENSE

If the Products include embedded software, or if you are purchasing software, Bayer grants to you a non-exclusive license to use such software provided by Bayer, solely in connection with, or to operate, the Products. Use of the software for any other purpose is strictly prohibited. This license is effective on the date you begin using the Products and software and will continue in effect unless you return the Products or software or if the license is terminated because you breach any provision of these Terms. Upon termination you shall immediately cease use of all software and shall return the Products and software to Bayer. The software copyright is owned by Bayer and is protected by United States copyright laws and international treaty provisions. Bayer does not transfer title to the software to you, but retains the rights to make and license the use of all copies. You shall not copy, translate, disassemble, or decompile nor create or attempt to create, by reverse engineering or otherwise, the source code from the object code of the software. You are not permitted to modify or make derivative works of the software and ownership of any unauthorized modification or derivative work shall vest in Bayer.

Quotation continued



Quotation prepared for: Carolinas Healthcare System

Issued on 7/27/2018

Valid until 5/27/2019

PRODUCT WARRANTY

NEW PRODUCTS: Bayer warrants that all new Bayer products are free from defects in workmanship or material under proper, normal use and service for a period of one year (12 months) from shipment, unless a longer period is provided on the warranty with the products, or as otherwise provided herein.

REFURBISHED: Bayer warrants that all refurbished Bayer products shall perform in accordance with the documentation provided, under proper, normal use and service for a period of the shorter of a) 90 days from installation or b) six months from shipment, unless a longer period is provided on the warranty with the products, or as otherwise provided herein.

DISPOSABLE PRODUCTS: If this Quote includes disposable products, Bayer's warranty shall be limited to repair or replacement of any defective disposable product upon receipt of the defective product and a Bayer Return Goods Authorization. You acknowledge that the disposables and the equipment are a system and your actions regarding your equipment may invalidate your warranty on the disposables.

During the warranty period, there shall be no charge for any action deemed necessary by Bayer, including parts, travel, or labor to fulfill the terms of the warranty, during local business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, except Bayer holidays.

SERVICES WARRANTY

If this Quote includes a service agreement that covers Corrective Maintenance, there will be no charge, for the period stated on the agreement, for any action (parts, labor, travel) deemed necessary by Bayer to service the equipment, excluding those items listed under "Exceptions". Bayer will perform on-site Corrective Maintenance during the hours specified on the maintenance program purchased. Buyer shall pay, as an additional charge for on-site Corrective Maintenance, all field labor and travel time, outside normal hours at Bayer's current service rates, including any appropriate premiums.

WARRANTY ON REPAIRS: All materials, labor and service provided hereunder are warranted to be free of defects in material or workmanship for the longer of the term of this agreement or ninety (90) days from the date provided.

PREDICTIVE MAINTENANCE SCHEDULE: If this Quote includes a service agreement, Bayer shall perform Predictive Maintenance on the Product(s) during the hours specified in the maintenance program purchased. For Injector Products, Bayer will perform Predictive Maintenance within the first sixty (60) days of the effective date of the agreement or within twelve (12) months from the last PM provided by Bayer, unless otherwise agreed. Predictive Maintenance performed outside of PM Hours will be charged an additional one half (1/2) of Bayer's current hourly service rate, including any applicable premiums.

UPTIME GUARANTEE: If this Quote includes a service agreement that includes an uptime guarantee the following language applies: THIS PROVISION IS NOT APPLICABLE FOR PRODUCT PURCHASES—CUSTOMERS ARE ONLY ENTITLED TO UPTIME GUARANTEES IF THEY PURCHASE SELECTED SERVICE AGREEMENTS. For any calendar quarter during the term of this service agreement, and as per the terms of the service agreement, Bayer guarantees that the Product(s), will maintain a level of uptime equal to or greater than 97%.

Uptime is defined as the state when the Product(s) is working and/or available for use to your satisfaction. Downtime is defined as the state when the system is not operable due to breakdown, performance of repairs, or failure to perform according to specifications. The period of downtime shall be from notification of the manufacturer's service call center (1-800-633-7237) until the Product(s) is returned/presented to the designated representative properly functioning and ready for use. Scheduled routine preventive maintenance, scheduled upgrades of Product(s) or software, operator error in use of the Product(s), failures designated under "Exceptions" of the terms of the service agreement, and external failures (i.e., power loss) shall not be considered downtime. The effectiveness level is computed as follows:

Uptime will be calculated using the following formula:
Uptime = $(T - TNF) \times 100$

Where "T" is the total number of hours (24 hours/day x 7 days/week x 13 weeks) and "TNF" is the number of covered hours (less any time a loaner or consigned spare part is made available) the Product(s), or any component of the Product(s) is not functional during the quarter. "TNF" will be measured beginning with the time of initial notification to Bayer that the Product(s) is inoperable for clinical use and the time the Product(s) is available again for clinical use. If any portion of the total functionality of the Product(s) is unavailable for operational use, the Product(s) will be considered down.

Downtime will not be calculated for (i) hours that are outside of contracted coverage terms, (ii) any malfunction or damage described under "Exceptions" in the manufacturers extended warranty or extended service agreement terms, (iii) scheduled preventive maintenance, or any other scheduled event, including those for the convenience of You, (iv) malfunctions caused by operator error, or (v) abuse of the Product(s), dead batteries, use of the Product(s) beyond its intended use or failure resulting from changes to the operator environment (i.e., scanner software, upgrades, changes, new magnet, room construction, etc.).

You will calculate uptime after each calendar quarter and will notify Bayer of any incident of non-conformance within 15 days of any such non-conformance. If uptime is less than 97%, then Bayer, upon verification, will extend the term of the service agreement without charge by one week for every full day that the Product(s) or any component of the Product(s) thereof is not operational beyond the allowable 3% level.



EXCEPTIONS TO PRODUCT WARRANTY AND SERVICE AGREEMENT COVERAGE

Your actions may invalidate this warranty. If Bayer determines that an equipment or disposable problem is due to any of the following, you agree to pay Bayer for all labor, travel, material handling and shipping at Bayer's, or Bayer's agents, standard rates:

Malfunctions and Damage

- a) Malfunction or damage due to abuse, misuse or spillage of any type of fluid in or on the unit.
- b) Malfunction due to operator error, including failing to follow specified provisions of the Operations Manual.
- c) Malfunction or damage due to unauthorized modification or repair. Unauthorized actions may jeopardize functionality, reliability, or operator and patient safety. Therefore any claim caused by unauthorized modification or repair shall not be covered by this warranty and Bayer is relieved from any further obligation. Bayer must review and authorize all modifications and repairs. This service may be obtained by contacting the Bayer Service Department.
- d) Malfunction or damage due to the use of non-Bayer or non-approved accessories. The use of accessories in connection with the equipment may jeopardize functionality, reliability or operator and patient safety. Therefore any claim caused by the use of non-Bayer or non-approved accessories (such as non-Bayer disposables or in the case of any PET/CT product, the use of vials or vial shields that are not approved by Bayer) shall not be covered by this warranty and Bayer is relieved from any further obligation.
- e) Damage by fire, floods, or other disaster commonly known as "Acts of God".
- f) If the Products include any Counterpoise system, any system malfunction, damage or failures due to improper installation or not meeting Bayer's specific requirements for level and plumb and/or loading as specified in the Bayer manuals.
- g) If the Products include any Counterpoise system, any ceiling or wall support structure used to mount or support an Injector.
- h) Overhead Counterpoise System is excluded from Bayer's warranty. Bayer does not in any way warrant such structure.
- i) Failures caused by network outages or improper network configuration.
- j) Specific services plans may include additional exceptions so please review the details of your service plan.

WARRANTY EXCLUSIONS

EXCEPT AS PROVIDED IN THE ABOVE WARRANTY SECTION, BAYER EXPRESSLY DISCLAIMS ALL WARRANTIES OR CONDITIONS OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, NON INFRINGEMENT AND FITNESS

FOR A PARTICULAR PURPOSE (WHETHER OR NOT IS AWARE OF YOUR INTENDED USE OF THE PRODUCT), AND ALL SUCH WARRANTIES ARE EXPRESSLY EXCLUDED. IN NO EVENT SHALL BAYER BE LIABLE FOR ANY LOST PROFITS OR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OR OPERATION OF BAYER'S PRODUCT OR SERVICE. BAYER WILL NOT BE RESPONSIBLE FOR DAMAGES THAT EXCEED THE PAYMENT, IF ANY, RECEIVED BY BAYER FOR THE PRODUCT OR SERVICES FURNISHED, OR TO BE FURNISHED, UNDER THIS AGREEMENT. Some states do not allow the exclusions on limitation of incidental or consequential damages, so the above limitations may not apply.

This Limited Warranty gives you specific legal rights and you may also have other rights.

SOFTWARE WARRANTY

If the Products include embedded software or if you are purchasing software, Bayer warrants that the software will substantially conform to the functional specifications contained in the Operations Manual for one year following delivery. This warranty shall not apply if you use the software in a manner that is not authorized or not in accordance with the user instructions or if you modify the Products or the software or if a party other than Bayer provides service to the Products or software. Bayer does not warrant that the software will operate uninterrupted or that it will be free from minor defects or errors that do not materially affect its performance. Your sole and exclusive remedy for any damages or loss in any way connected with the software whether due to Bayer's negligence or breach of any other duty shall be, at Bayer's option: i) to bring the performance of the software into substantial compliance with the functional specifications or ii) return of an appropriate portion of any payment by you with respect to the portion of the software that is not functioning.

INDEMNIFICATION

Bayer agrees to indemnify, defend and hold you harmless from any liability, loss, expense, cost, claim or judgment (including attorneys fees), arising out of any claim by a third party for property damage, or personal injury or death where the product or services were alleged to have caused or contributed to the damage, injury or death, provided that this indemnification does not extend to injuries, damages or death to the extent caused by the negligence, reckless disregard or intentional acts of you or any third party.

FORCE MAJEURE

Bayer will not be responsible for delays or non-performance directly or indirectly caused by any acts of God, fire, explosion, flood, war, accident, action by governmental authority, inability to procure supplies and raw materials, delays in transportation, work stoppage, court order, and other causes beyond Bayer's reasonable control.

Quotation continued



Quotation prepared for: Carolinas Healthcare System

Issued on 7/27/2018

Valid until 5/27/2019

COMPLIANCE WITH LAWS/EXPORT

In addition to any rights and remedies specifically identified here in this Quote, Bayer shall have all rights and remedies conferred by law. Bayer shall not be required to perform its obligations under this Quote if you have defaulted (e.g., failed to pay) under this Quote or any other contract involving Bayer. This Agreement shall be construed in accordance with the laws of the Commonwealth of Pennsylvania, United States of America. You warrant that you are and will remain in compliance with all export and re-export requirements, laws and regulations of the United States of America and any other applicable export and re-export laws and regulations.

the event this Agreement is terminated or is not renewed, within sixty (60) days of contract termination or expiration Bayer will disable the VirtualCare system so that all auto alerts originating with the VirtualCare system will be muted and Bayer will no longer receive such notices. If the VirtualCare system is disabled by Bayer or taken offline by you, Bayer will no longer continue its current practice of automatic remote monitoring and error code detection, or proactive event assessment and diagnostics. You understand that the VirtualCare connection may still exist but that no information will be relayed to Bayer from your systems.

HIPAA

Bayer represents that it is not a Business Associate as defined in the Health Insurance Portability and Accountability Act ("HIPAA"). The functions Bayer is required to perform hereunder do not require the use or disclosure of Protected Health Information ("PHI"). To the extent any disclosure of PHI does occur, it is incidental and covered under the incidental disclosure rule found in 45 CFR 164.502(a)(1). In addition, to the extent any such incidental disclosure does occur, Bayer agrees to keep all such information confidential.

SERVICE AGREEMENT CANCELLATION

Bayer may terminate any Service Agreement by giving written notice to you if you have not made payment by the due date or if you do not give Bayer access to the equipment at the scheduled time for service. You may cancel this Agreement at any time by giving sixty (60) days prior written notice to the Bayer Service Department. If the Agreement is terminated for any reason Bayer shall refund to you an amount equal to the amount you prepaid for the service that year less the assessed value of any Engineered Predictive Maintenance ("EPM") performed and the assessed value of any remaining agreement covered. If the EPM was performed and at least one onsite emergency service event was performed during the agreement period, the agreement shall be considered fulfilled and no refund for that service year will be due to you.

VirtualCare[®] REMOTE SERVICE. Bayer may provide remote diagnostic and monitoring services on the products under this Agreement using Bayer's proprietary hardware and software (the "Maintenance Materials"). Bayer provides the Maintenance Materials to you for use with the VirtualCare service. You have no right to use the Maintenance Materials except for the VirtualCare service and title to the Maintenance Materials remains with Bayer at all times. You may not sell, assign or transfer the Maintenance Materials to any third party. If you terminate VirtualCare service for any reason, you must contact Bayer to facilitate the return of the hardware to Bayer. If you fail to return the hardware to Bayer or breach the use provisions set forth herein, Bayer may remove the hardware from your site. The Maintenance Materials are and will remain Bayer's sole and exclusive property and Bayer does not grant you any licensed rights in the Maintenance Materials. In

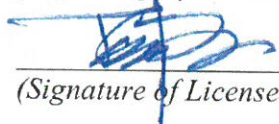
Attachment D

PROPOSED TOTAL CAPITAL COST OF PROJECT

Project name: Carolinas Medical Center Emergency Department Fixed CT Scanner
Provider/Company: Perkins+Will

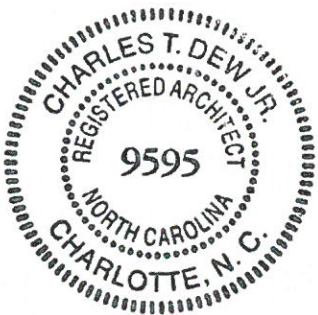
(1) Purchase price of land	\$0
(2) Closing costs	\$0
(3) Site Preparation	\$0
(4) Construction/Renovation Contract	\$2,139,223
(5) Landscaping	\$0
(6) Architect/Engineering Fees	\$323,600
(7) Medical Equipment	\$2,133,077
(8) Non Medical Equipment	\$874,008
(9) Furniture	\$35,000
(10) Consultant Fees (CON Fees, Legal Fees)	\$0
(11) Financing Costs	\$0
(12) Interest During Construction	\$0
(13) Other (IS, Security, Internal Allocation)	\$557,698
(14) Total Capital Cost	\$6,062,606

I certify that, to the best of my knowledge, the above construction related costs of the proposed project named above are complete and correct.



(Signature of Licensed Architect or Engineer)

1/6/2016
DATE



Sales taxes have been included in these equipment costs. However, because Atrium Health is entitled to a sales tax refund under N.C. Gen. Stat. § 105-164.14(b) and 105-467, the sales tax that Atrium Health initially incurs for this medical equipment purchase will be refunded to Atrium Health, and thus will reduce the capital costs that Atrium Health actually incurs for the equipment by \$ 141,748.00 .

Attachment E

Letter of No Review



Carolinan HealthCare System

James E.S. Hynes
Chairman

Michael C. Tarwater, FACHE
President & CEO

October 7, 2005

Ms. Lee B. Hoffman, Chief
Certificate of Need Section
Division of Facility Services
701 Barbour Drive
Raleigh, North Carolina 27626-0530

RE: Morehead Medical Plaza Imaging Center

Dear Ms. Hoffman:

Carolinan Medical Center (CMC) is planning to develop an outpatient imaging center on the first floor of the Morehead Medical Plaza building, a new multi-story medical office building on the CMC campus. The project will include the purchase of new equipment and the relocation of existing equipment from the imaging center at Medical Center Plaza, an existing medical office building on the campus, and from the radiology department on the fourth floor of CMC.

Morehead Medical Plaza is being developed by an independent developer. CMC will lease the space for the imaging center. The total capital cost for the upfit of the medical office building space is estimated to be \$1,469,720. The cost for new equipment and the relocation of existing equipment is estimated to be \$451,431, resulting in a total project cost of \$1,921,151. A certified cost estimate is attached for your review (please see Attachment 1).

Based upon the project as described above, the project does not represent a new institutional health service as defined in N.C.G.S. §131 E-176 (16) and does not require a Certificate of Need. As such, this letter serves as notification of our intent to proceed with the project. If you have any questions or require further information regarding this project, please call me at 704-355-0314.

Sincerely,

Greg S. Bass, Director
CHS Management Company

Attachments

ATTACHMENT 1

Certified Capital Cost of Project

Project name: Morhead Medical Plaza Imaging Center OSR # 2083269

A. Site Costs

(1) Full purchase price of land	N/A
Acres _____ Price per Acre \$ _____	
(2) Closing costs	_____
(3) Site Inspection and Survey	_____
(4) Legal fees and subsoil investigation	_____
(5) Site Preparation Costs	
Soil Borings	_____
Clearing-Earthwork	_____
Fine Grade for Slab	_____
Roads-Paving	_____
Concrete Sidewalks	_____
Water and Sewer	_____
Footing Excavation	_____
Footing Backfill	_____
Termite Treatment	_____
Other (Specify)	_____
Sub-Total Site Preparation Costs	N/A
(6) Other (Specify)	_____
(7) Sub-Total Site Costs	N/A

B. Construction Contract

(8) Cost of Materials	
General Requirements	_____
Concrete/Masonry	_____
Woods/Doors & Windows/Finishes	_____
Thermal & Moisture Protection	_____
Equipment/Specialty Items	_____
Mechanical/Electrical	_____
Other - Information Systems	\$87,825
Sub-total Cost of Materials	included
(9) Cost of Labor	_____
(10) Other (Specify)	\$1,081,895
(11) Sub-Total Construction Contract	1,169,720

C. Miscellaneous Project Costs

(12) Building Purchase	_____
(13) Fixed Equipment Purchase/Lease	\$361,431
(14) Movable Equipment Purchase/Lease	_____
(15) Furniture	90,000
(16) Landscaping	0
(17) Consultant Fees	
Architect and Engineering Fees	\$200,000
Legal Fees	_____
Market Analysis	_____
Other (Specify)	_____
Other (Specify)	_____
Sub-Total Consultant Fees	200,000
(18) Financing Costs (e.g., Bond, Loan, etc.)	_____
(19) Interest During Construction	_____
(20) Contingency	100,000
(21) Sub-Total Miscellaneous	751,431
(22) Total Capital Cost of Project (Sum A-C above)	\$1,921,151

I certify that, to the best of my knowledge, the above construction related costs of the proposed project named above are complete and correct.

Franklin H. Probst
 (Signature of Licensed Architect or Engineer)

Oct 3, 2005
 (Date)

ATTACHMENT 2

Equipment Costs

Morehead Medical Plaza Imaging Center Medical Equipment List

Existing Equipment Moved

Equipment Type	Current Location	Equipment Number	Serial Number	Relocation Cost
CT	MCP	162829	2801	\$32,000
Fluoro	CMC Fluoro #2	76958	993070	\$22,000
Fluoro	MCP	38930	973060	\$22,000
Nuc Med	CMC 4th Floor	125675	8776	\$20,000
PET	CMC 4th Floor	301010	0301010	\$35,000
TOTAL				\$131,000

Used Equipment Purchased

Equipment Type	Vendor	Model Number	Serial Number	Purchase Price
CT	GE	Qxi		\$100,000

New Equipment Purchased

Equipment Type	Vendor	Purchase Price
Miscellaneous	Miscellaneous	\$130,431

Total	\$361,431
--------------	------------------

Notes: MCP = Medical Center Plaza

ATTACHMENT 3

Used Equipment Quote



GE Healthcare Technologies
Medical Equipment Exchange
3114 N. Grandview Blvd (W-544)
Waukesha, WI 53188
Fax 262-513-4185

PURCHASE AGREEMENT

THE GENERAL ELECTRIC COMPANY, THROUGH ITS GE HEALTHCARE TECHNOLOGIES MEDICAL EQUIPMENT EXCHANGE DIVISION, hereby offers to sell **GE QXI CT scanner**, located at **Carolinas Medical Center, 1000 Blythe Blvd, Charlotte, NC 28203** and "BUYER" "**Carolinas Medical Center, 1000 Blythe Blvd, Charlotte, NC 28203**" agrees to purchase the following equipment according to the terms and conditions as set forth within the attached **STANDARD CONDITION OF PURCHASE FOR GE HEALTHCARE TECHNOLOGIES MEDICAL EQUIPMENT EXCHANGE**:

DESCRIPTION OF EQUIPMENT:

GE QXI CT scanner installed at Carolinas Medical Center. System ID 704355CTB

PAYMENT TERMS: Full payment due now.

Unit Price: \$100,000.00 (ref# 2536844) Cashiers Check will NOT be accepted as form of payment.

Send Payment To:
GE HEALTHCARE TECHNOLOGIES - GoldSeal/MEE Attn: Rob Kearney
(mail stop W-544), 3114 N. Grandview Blvd. Waukesha WI 53188.

ACCEPTANCE: GE and BUYER have carefully read the **STANDARD CONDITIONS OF PURCHASE FOR GE HEALTHCARE TECHNOLOGIES MEDICAL EQUIPMENT EXCHANGE**. Signature below by both parties constitutes a binding purchase agreement according to all its terms and conditions.

**GE HEALTHCARE TECHNOLOGIES
MEDICAL EQUIPMENT EXCHANGE**

Name: Rob Kearney

Title: Trade/Sales Specialist

Date: _____

Signature

**BUYER
Carolinas Medical Center**

Name: MICHAEL RUSH

Title: DIRECTOR, MATERIALS RESOURCE MGT

Date: 9/29/05

Michael Rush
Signature

GE Healthcare Technologies

Medical Equipment
EXCHANGE

GE Healthcare Technologies
Medical Equipment Exchange
3114 N. Grandview Blvd (W-544)
Waukesha, WI 53188
Fax 262-513-4185

STANDARD CONDITIONS OF PURCHASE FOR GE HEALTHCARE TECHNOLOGIES MEDICAL EQUIPMENT EXCHANGE

These conditions apply to the GE Healthcare Technologies Medical Equipment EXCHANGE Equipment ("Equipment") listed in the Purchase Agreement. The Equipment is pre-owned and sold AS IS and with no warranties, as described below. The Purchase Agreement is the multi-page numbered document that has been typed with the name and address of the buyer ("Buyer"), these Standard Conditions of Purchase, and any applicable special terms.

FORMATION OF CONTRACT

The Purchase Agreement is a request for an offer of purchase from Buyer. By signing the Purchase Agreement and returning it to the General Electric Company, through its GE Healthcare Technologies Medical Equipment EXCHANGE division ("Seller") with a deposit in the amount specified in the Purchase Agreement, Buyer makes an offer to purchase the Equipment under the terms and conditions specified in the Purchase Agreement. Seller accepts Buyer's offer by the signature of a Sales Manager and by the credit approval of Seller's customer credit department.

The Purchase Agreement is intended to be the complete and exclusive statement of the terms of the contract between both parties. Seller's acceptance of Buyer's offer is expressly made conditional on Buyer's assent to all of Seller's terms. No prior proposals, statements, course of dealing or usage of the trade will be part of the contract. After the contract has been formed, it may be modified only in writing, signed by Seller's Sales Manager and by Buyer.

PRICE, TAXES AND UPGRADES

The price Buyer will pay is stated in the Purchase Agreement. **The price quoted does not include tax. Any applicable taxes will be billed upon final invoicing, unless a valid tax exemption certificate is received prior to processing.**

PAYMENT

The payment terms are stated in the Purchase Agreement. If any payment depends on an event (e.g., de-installation) that is delayed for a reason for which Buyer is responsible, Buyer will make the payment when the event was first scheduled to occur. Buyer grants to Seller a purchase money security interest in all items listed in the Purchase Agreement until Seller receives full payment.

Late payments will be subject to a late fee equal to 1% per month (or the amount allowed by law, whichever is less) on the outstanding amount.

EQUIPMENT AVAILABILITY, NOTICE OF SALE

Because the Equipment may be offered simultaneously to several customers, its sale to Buyer is subject to its continued availability at the time Buyer offer to purchase it. If the Equipment is no longer available, (1) Seller will attempt to identify other pre-owned equipment in Seller's inventory that meets Buyer's needs, and (2) if substitute equipment is not acceptable to Buyer, Seller will cancel Buyer's order and refund any deposit Buyer has paid Seller for the cancelled order. This is Seller's sole liability and Buyer's sole remedy. Equipment availability dates are approximate. Seller is not liable for delays in performance or delivery due to a cause beyond Seller's reasonable control. These causes include, without limitation, the failure of any third party to make the Equipment available, as well as government priorities and labor or transportation problems. If such a delay occurs, Seller may extend the performance or availability date for a period of time equal to the delay.

Closing of this sale is conditioned upon: (1) notice of the disposition of the Equipment having been provided to all necessary parties, if legally required, and (2) prior to the sale closing date, Seller not having been enjoined, stayed or otherwise legally prohibited from closing this sale as a result of bankruptcy, redemption, etc.

INSPECTION

The Equipment specifications contained in the Purchase Agreement are based solely on the representations made to Seller by the Equipment's prior owner. Buyer is entitled to conduct a complete inspection of the Equipment (at Buyer's cost) within 5 days of the date that Buyer signs the Purchase Agreement ("Inspection Period"), unless a different Inspection Period is specified in the Purchase Agreement, and Seller will assist Buyer in a reasonable manner to make arrangements to conduct the inspection. If Buyer elects not to conduct an inspection during the Inspection Period, Buyer is deemed to have waived Buyer's right of inspection.

If, during Buyer's inspection, Buyer determines that the Equipment materially deviates from the specifications described in the Purchase Agreement, Buyer will notify Seller in writing within 48 hours of the date of inspection. Seller will have the option to do one of the following, which will be Seller's sole liability and Buyer's sole remedy: (1) renegotiate the price to be paid with respect to such Equipment; or (2) terminate this Agreement and return to Buyer all monies Buyer has paid with respect to such Equipment.

GE Healthcare Technologies

Medical Equipment
EXCHANGE

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3114 N. Grandview Blvd (W-544)
Waukesha, WI 53188
Fax 262-513-4185

DE-INSTALLATION, PICK-UP, TRANSPORTATION, AND INSTALLATION

Seller will notify Buyer when Buyer may take possession of the Equipment. Buyer is responsible for de-installation, pick-up, rigging, crating, transportation, and installation of the Equipment, at Buyer's cost. Buyer may retain Seller to provide these services, under a separate agreement. Buyer assumes sole liability for property damage or personal injury related to Buyer's obligations under this contract. It is the Buyer's sole responsibility to coordinate the de-installation with the Seller's Installation Team and to insure the specific date and time for de-installation. Any deviations from the agreed upon schedule, caused by Buyer, which result in additional costs to either Seller or the site will be paid by Buyer. Buyer will take possession of the Equipment in a timely manner, and leave the de-installation and pick-up areas in a clean and orderly condition. It is expected that the removal will be conducted in a professional and courteous manner designed to cause no undo disruptions in the sites daily workflow. If Buyer delays taking possession of the Equipment or performing any other obligations, and Seller deinstalls, transports, and/or stores the Equipment, Buyer will be responsible for such costs, and will pay them within 10 days of receipt of Seller's invoice. In addition, if Buyer delays taking possession of the Equipment by more than 10 days after the date it is available for possession, Seller may, at Seller's option, terminate this contract, retain any deposit or other payments made in order to compensate Seller for costs associated with Buyer's default, and sell the Equipment to another party to help offset any remaining deficiency. On Seller's request, Buyer will provide Seller with a certificate of insurance naming Seller as an additional insured, evidencing coverage against damage or injury resulting from acts or omissions by Buyer or Buyer's agents while carrying out Buyer's responsibilities under this contract.

TITLE AND RISK OF LOSS

Seller represents that Seller has full right, title, and authority to sell the Equipment. Title to the Equipment will pass to Buyer upon Seller's receipt of Buyer's payment in full of the purchase price. Risk of loss will pass to Buyer on the date the Equipment is available for Buyer to take possession of it or the date Seller gives Buyer notice of its availability, whichever is later. From that point forward, Buyer bears all risk of loss associated with the Equipment, including the risk of loss or damage during de-installation, rigging, transportation, storage, and installation. Until such time as the risk of loss passes to Buyer, in the event of loss or damage to the Equipment, Seller has the option to do one of the following, which will be Seller's sole liability and Buyer's sole remedy: (1) renegotiate the price to be paid with respect to lost or damaged Equipment; or (2) terminate this Agreement and return to Buyer all monies Buyer has paid with respect to such Equipment.

SOFTWARE AND OTHER LICENSES NOT INCLUDED

Buyer has the sole responsibility to contact the manufacturer of the Equipment and obtain any necessary licenses to use any software or any other licensed products embedded in the Equipment.

NON-CIRCUMVENTION

To facilitate Buyer's inspection of the Equipment, Buyer will be provided with the location of the Equipment and the identity of the current owner. If Buyer purchases the Equipment directly or indirectly from a party other than Seller for a period of 2 years from the date of this Purchase Agreement, Buyer will pay Seller a finder's fee of 30% of the price Buyer paid for the Equipment to compensate Seller for locating the Equipment for Buyer.

REGULATORY MATTERS

Buyer acknowledges that the Equipment is a prescription medical device regulated by the U.S. Food and Drug Administration ("FDA") and may only be used by or on the order of a licensed health care provider. If Buyer re-sells the Equipment to a third party, Buyer (1) is responsible for ensuring that the Equipment complies with all applicable FDA regulations at the time it is delivered to a health care provider for use and for compliance with all applicable FDA product locator and other regulations; and (2) will indemnify Seller against any damages or costs incurred by Seller that are attributable to Buyer's failure to ensure that the Equipment is sold in accordance with FDA regulations applicable at the time the Equipment is delivered to such third party.

PURCHASE FOR EXPORT

Buyer will comply with all applicable U.S. and local laws, including the Foreign Corrupt Practices Act, and warrant that the Equipment will not be exported to the Republic of China. If Buyer is purchasing the Equipment for export, Buyer is responsible to obtain any required export or import licenses or documentation.

DISCLAIMER OF WARRANTIES

The Equipment is provided AS IS, with no warranties and with all faults, obvious and latent, that may be discovered before or after Buyer's purchase. Seller did not inspect, recondition, alter, modify, or manufacture the Equipment. Buyer represents that Buyer had the option to inspect the Equipment, as described above. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY WARRANTY REGARDING THE ACCURACY OF EQUIPMENT SPECIFICATIONS OR OPERABILITY, NOR ARE THERE ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

GE Healthcare
Technologies

Medical Equipment
EXCHANGE

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Waukesha, WI 53188
Fax 262-513-4185

LIMITATIONS OF REMEDIES AND DAMAGES

THE TOTAL LIABILITY OF SELLER AND SELLER'S REPRESENTATIVES TO BUYER AND BUYER'S EXCLUSIVE REMEDY RELATING TO THE PURCHASE AGREEMENT AND THE ITEMS LISTED IN IT IS LIMITED TO THE PRICE STATED IN THE PURCHASE AGREEMENT FOR THE PRODUCT OR SERVICE WHICH IS THE BASIS FOR THE CLAIM. Buyer agrees that Seller and Seller's representatives have no liability to Buyer for (1) any punitive, incidental or consequential damages such as lost profit or revenue; or (2) anything occurring after risk of loss passes to Buyer. Buyer will be barred from any remedy unless Buyer gives Seller prompt written notice of the problem complained of.

This is a commercial sales transaction. Any claim related to this contract will be covered solely by commercial legal principles. Seller, Seller's representatives and Buyer will have no tort or other liability to the other arising out of this contract.

This limitation does not affect claims by third parties for personal injury due to Seller's, Seller's representatives' or Buyer's negligence or product liability. Buyer will indemnify Seller and Seller's employees, agents, officers, and directors for any claim or loss directly or indirectly attributable to Buyer's acquisition, use, or sale of the Equipment, except to the extent that such claim or loss is caused by Seller's gross negligence or willful misconduct.

CONFIDENTIAL INFORMATION

Each party will treat patient information to which it may have access under this Purchase Agreement as confidential in accordance with applicable laws.

GENERAL MATTERS

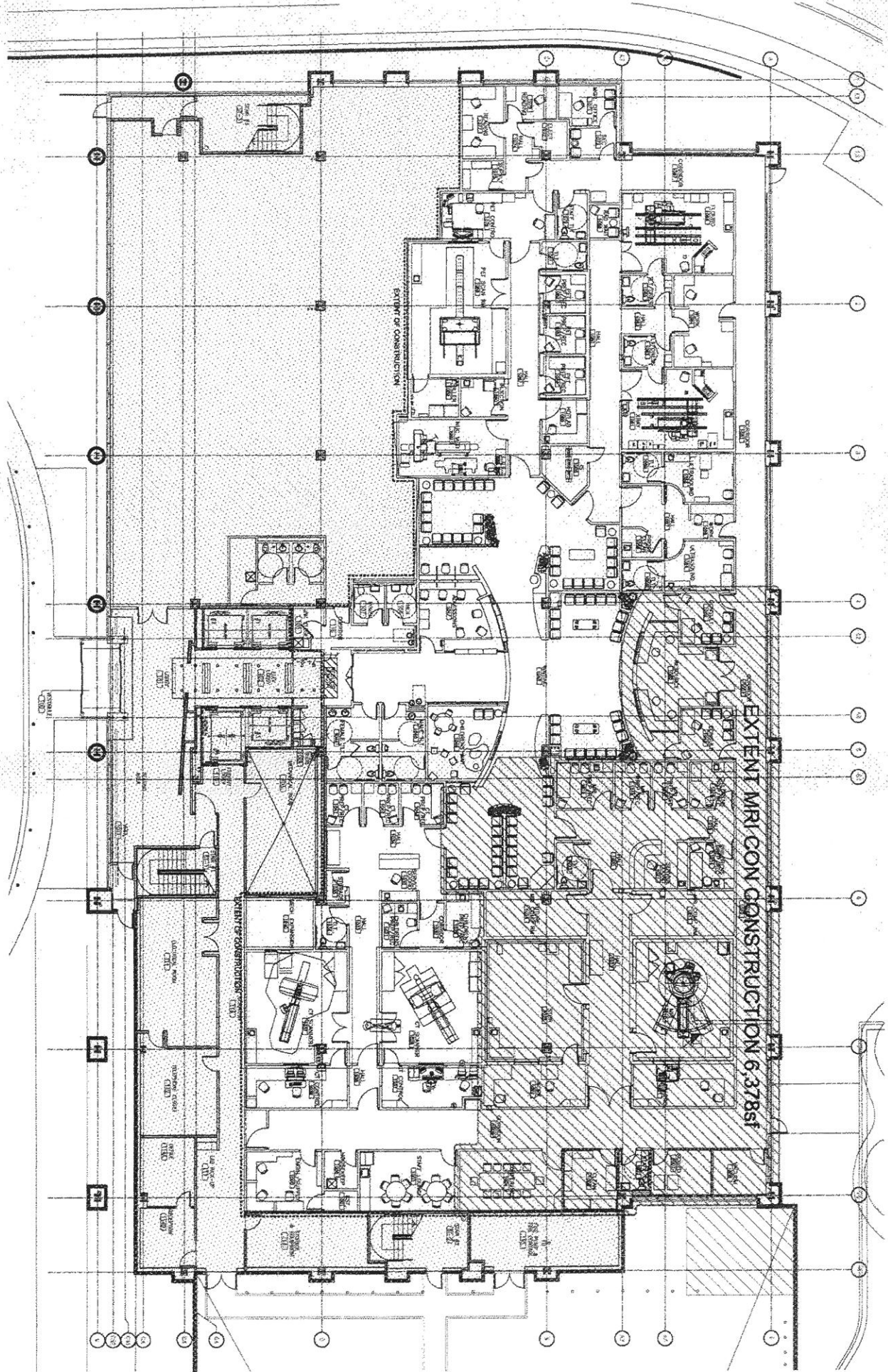
Any assignment of this contract will be void without the other party's prior written consent, which will not be unreasonably withheld. Seller can hire a subcontractor to perform work under the contract. If any part of the contract is found invalid, the remaining part will be effective. Both parties expressly acknowledge that the laws of the state of New York, except its conflict of laws rules, will govern the relationship between the parties. In the event it is necessary for Seller to enforce any part of this Agreement, including payment obligations, Buyer will pay Seller's costs of enforcement, including reasonable attorneys' fees and collection costs.

END OF PRODUCT LIFE

If the product Buyer is purchasing has been previously announced by Seller or any other medical equipment manufacturer as end of product life, Seller makes no claims as to the future availability of parts, service contracts or hourly-billed service for this device.

ATTACHMENT 4

Line Drawing





Carolinus HealthCare System

James E.S. Hynes
Chairman

Michael C. Tarwater, FACHE
President & CEO

January 18, 2006

Ms. Lee B. Hoffman, Chief
Certificate of Need Section
Division of Facility Services
701 Barbour Drive
Raleigh, North Carolina 27626-0530

RE: Morehead Medical Plaza Imaging Center

Dear Ms. Hoffman:

In our phone conversation today you requested additional information relating to the ownership of the outpatient imaging center Carolinus Medical Center (CMC) plans to develop on the first floor of the Morehead Medical Plaza building, a new multi-story medical office building on the CMC campus. The imaging center and equipment will be owned and operated by CMC and imaging services will be billed under the hospital's provider number.

As I described in my letter on October 7, 2005, the project will include the purchase of equipment and the relocation of equipment from the existing hospital-owned imaging center at Medical Center Plaza and from the radiology department on the fourth floor of CMC. The total capital cost for the project is estimated to be \$1,921,151 as was documented by the certified cost estimate attached to previous letter.

Based upon the project as described above, the project does not represent a new institutional health service as defined in N.C.G.S. §131E-176 (16) and does not require a Certificate of Need. As such, this letter serves as notification of our intent to proceed with the project. If you have any questions or require further information regarding this project, please call me at 704-355-0314.

Sincerely,

Greg S. Bass, Director
CHS Management Company



North Carolina Department of Health and Human Services
Division of Facility Services
Certificate of Need Section

2704 Mail Service Center ■ Raleigh, North Carolina 27699-2704

Michael F. Easley, Governor
Carmen Hooker Odom, Secretary

<http://facility-services.state.nc.us>

Lee Hoffman, Section Chief
Phone: 919-855-3873
Fax: 919-733-8139

January 24, 2006

Greg S. Bass
Carolina HealthCare System
PO Box 32861
Charlotte, NC 32861-2861

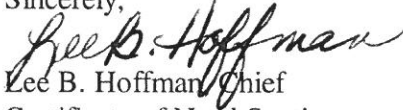
RE: No Review/ Carolina Medical Center/ Develop outpatient imaging center, in Morehead Medical Plaza, to be licensed and operated as part of the hospital/ Mecklenburg County

Dear Mr. Bass:

The Certificate of Need (CON) Section received your letter of January 19, 2006, regarding the above referenced proposal. Based on the CON law **in effect on the date of this response to your request**, the proposal described in your correspondence is not governed by, and therefore, does not currently require a certificate of need. However, please note that if the CON law is subsequently amended such that the above referenced proposal would require a certificate of need, this determination does not authorize you to proceed to develop the above referenced proposal when the new law becomes effective.

It should be noted that this determination is binding only for the facts represented by you. Consequently, if changes are made in the project or in the facts provided in your correspondence referenced above, a new determination as to whether a certificate of need is required would need to be made by the Certificate of Need Section. Changes in a project include, but are not limited to: (1) increases in the capital cost; (2) acquisition of medical equipment not included in the original cost estimate; (3) modifications in the design of the project; (4) change in location; and (5) any increase in the number of square feet to be constructed.

Sincerely,


Lee B. Hoffman, Chief
Certificate of Need Section

cc: Medical Facilities Planning Section, DFS



Attachment F



Carolinass HealthCare System

PO Number: C903259
PO Date: 12/29/2011

PURCHASE ORDER MODIFIED		
<p>Vendor: SIEMENS MEDICAL SOLUTIONS USA INC 51 VALLEY STREAM PARKWAY MALVERN, PA 19355 Phone: 888-222-9944 Fax: 15016437439</p>	<p>Ship To: 100 MEDICAL CENTER PLAZA 1001 BLYTHE BLVD C CHARLOTTE, NC 28203 GLN: Phone: 704-512-7323 Fax:</p>	<p>Bill To: CHS ACCOUNTS PAYABLE Carolinass Healthcare System Invoices@CarolinassHealthCare.org PO Box 5379 Portland, OR 97228-5379 Phone: 704-512-7345 Fax:</p>
<p>Terms & Conditions :</p> <p>SHIPMENT: All Goods will be suitably packed for shipment. All shipments will be declared by Vendor at full valuation to obtain full insurance coverage. Vendor will ship by means specified on the P.O., or, if not so specified, by customary common carrier or mail service. Each package in a shipment will be accompanied by a packing list specifically referencing the P.O. number.</p> <p>Carolinass HealthCare System (CHS) will have a reasonable time to inspect all Goods and Services. Any nonconforming Goods may be returned, in whole or in part, at Vendor's expense, and any nonconforming Services may be rejected, in whole or in part. If Vendor delivers more than the quantity of Goods specified in any P.O., CHS may return the excess Goods at Vendor's expense. Payment for Goods or Services specified in a P.O., the inspection of such Goods or Services, or the failure to so inspect the Goods and Services will not constitute a waiver or remedies available under the Agreement or applicable law. If any Goods provided under the Agreement is a chemical substance or mixture, Vendor will furnish CHS with the following: (a) a Material Safety Data Sheet for the chemical, (b) the CAS name and number of the chemical substance, or the goods composing a mixture and (c) a certificate that the chemical has been registered with the Environmental Protection Agency in accordance with the Toxic Substances Control Act and complies with the requirements of such Act. Vendor will comply with OSHA's "Hazard Communication Standard." All electrical equipment to be provided under the Agreement will conform to (and have attached appropriate labeling indicating that such equipment meets the requirements of) the UL, ETL or CSA standards or other standards recognized by the laws of the State of North Carolina and any local laws of the city and county in which the facility is located when delivered to as directed in the P.O. ANY EQUIPMENT THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF THIS SECTION MAY BE REJECTED AND RETURNED TO VENDOR AT VENDOR'S EXPENSE. ACKNOWLEDGEMENT: Promptly after receiving any P.O., Vendor will acknowledge CHS by either accepting the P.O., as submitted or communicating any proposed additions or changes. These revisions not become effective until CHS accepts the Vendor's proposed additions or modifications in writing. Vendor agrees to comply with any other specific terms of the P.O. If Vendor is unable to comply with those terms, including being unable to provide the total quantity specified, CHS will have the option to cancel, at no charge, the applicable P.O. or any portion of that P.O., in addition to any other remedies available under law. IN NO EVENT WILL VENDOR SHIP SUBSTITUTING GOODS OR TENDER SUBSTITUTING PERFORMANCE WITHOUT THE PRIOR WRITTEN CONSENT OF CHS. These remedies are in addition to, and not in lieu of, those remedies available to CHS under the Uniform Commercial Code.</p> <p>INVOICES: Vendor will submit itemized invoices for the goods or services provided under the Agreement. The invoices will be submitted within three (3) business days of when the Goods or Services are provided in accordance with the P.O. Invoice must mirror P.O. to receive prompt payment. Any invoice sent with a discrepant line will not be paid until this variance is cleared. Invoices must match in catalog number, line number, Quantity, Description, Price, and P.O. Number.</p> <p>AGREEMENTS: Any conflict between these terms and those that may have been signed with CHS will be governed by the signed agreement between the vendor and CHS; otherwise these shall supersede all others, whether sent prior or subsequent to receipt of this order by vendor, unless CHS accepts the Vendor's proposed additions or modifications in writing.</p>		



Carolinus HealthCare System

PO Number: C903259
 PO Date: 12/29/2011

PURCHASE ORDER MODIFIED									
Vendor:			Ship To:			Bill To:			Ext. Price Tax
SIEMENS MEDICAL SOLUTIONS USA INC 51 VALLEY STREAM PARKWAY MALVERN, PA 19355 Phone: 888-222-9944 Fax: 15016437439			100 MEDICAL CENTER PLAZA 1001 BLYTHE BLVD C CHARLOTTE, NC 28203 GLN: Phone: 704-512-7323 Fax:			CHS ACCOUNTS PAYABLE Carolinus Healthcare System Invoices@CarolinusHealthCare.org PO Box 5379 Portland, OR 97228-5379 Phone: 704-512-7345 Fax:			Ext. Price Tax Ext Price w/ Tax
Vendor Code: 1081957 PO Type: CAP PO Status: Complete Customer No:			Comment: PO is being sent on behalf of John Palmer 704.512.7305, FAX 704.512.7266 EMAIL: john.palmer@carolinushealthcare.org Project: CERP 2012-CMC CT, OSR2505066 ATTN:			Composed By: Melvin, Levi - CHS Capital Buyer Special Terms: 45DAYSNET FOB: DESTINATION Delivery Date: 06/30/2012 Tax ID Number: Not Null			
Line Modified			Vendor Catalog GTIN	Order Quantity	Mfr Catalog Contract	Charge Dept. Sub-Ledger	Project Sub-Project	Price Discount List Price	Ext. Price Tax Ext Price w/ Tax
Item: [non-catalog]			QUOTE NO. 1-3CMHEU REV. 0/INV. 75019528	1 EA	Unknown	106-1004000000-180003	CHS CSR2505066	\$516,000.00 \$37,410.00 \$553,410.00	
Item: [non-catalog]			QUOTE NO. 1-3CMHEU REV. 0	1 EA	Unknown	106-1004000000-180003	CHS CSR2505066	\$129,000.00 \$9,352.50 \$138,352.50	
PO Sub Total:			\$645,000.00	Tax Total:	\$46,762.50	Purchase Order Total:	\$691,762.50		
Signature(s):									

Attachment G



**Get two steps ahead
with Dual Source CT
SOMATOM Force**

usa.siemens.com/somatom-force

SIEMENS
Healthineers 

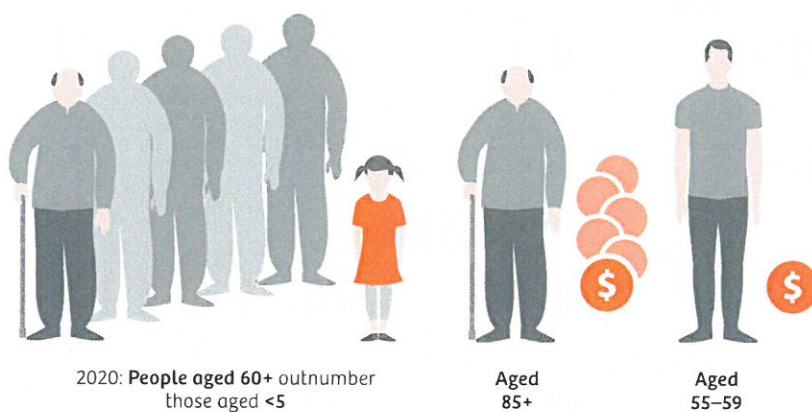
Improving accuracy & advancing therapy results

How can CT make a difference?

Aging societies and their impact on healthcare cost

Demographic change

People are living longer worldwide. However, health in the later years hasn't significantly improved. Because the number of people aged 60 years and older is expected to increase by 1.1 billion from 2015 to 2050,¹ the impact on healthcare costs will be substantial.



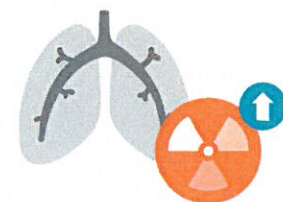
Globally, people aged 60 and older will outnumber children younger than five in 2020.¹

In per capita health spending, there's a sixfold difference between people over 85 and those between 55 and 59.²

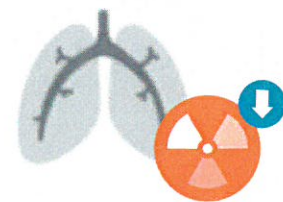
Diagnostic quality with no dose penalty

Image quality and dose—finding the right balance

In high-risk, asymptomatic cohorts, early detection of potential diseases can make sense. With conventional CT, however, this might imply a dilemma between high doses and uncertain results.



Sustainable results might come with too high dose...

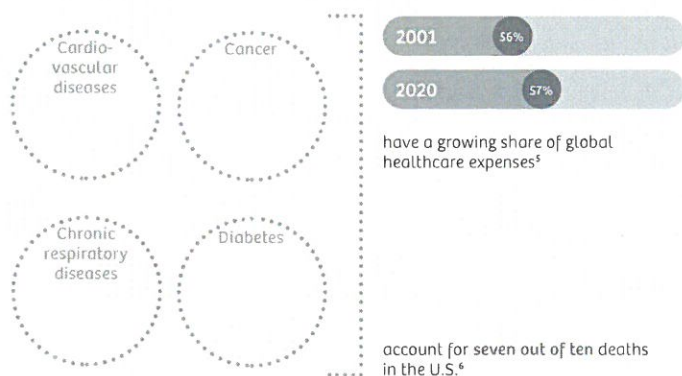


...or dose reduction might compromise image quality

Four key diseases with a high toll

Chronic disease burden

Chronic, non-communicable diseases account for an ever-increasing share of healthcare costs in developed societies. CT imaging can contribute to earlier detection and accurate evaluation of cancer and cardiovascular diseases in particular.



A small number of chronic disease types has a disproportional impact on both healthcare costs and death rates.

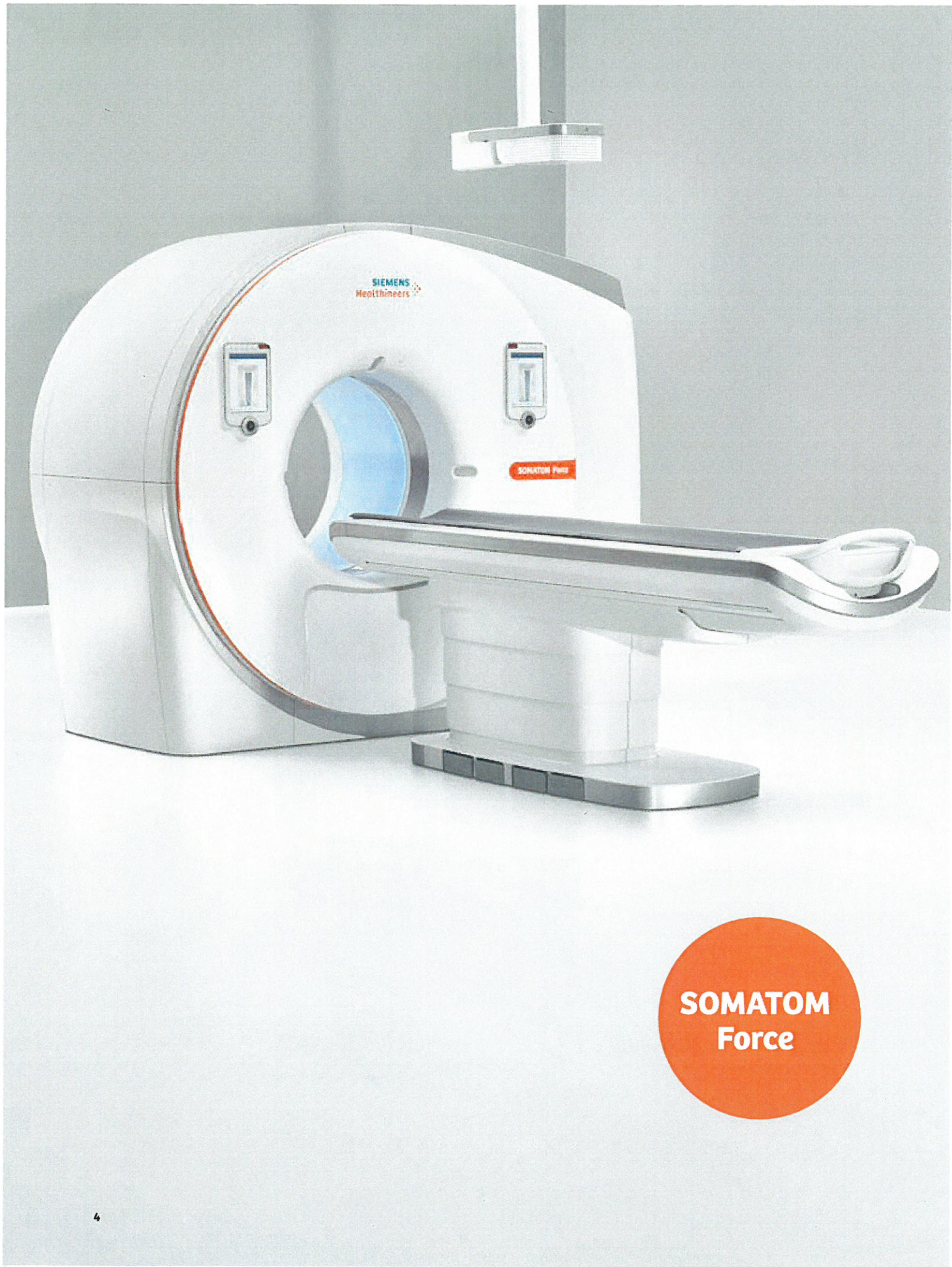
The goal: precision medicine

Precision medicine

How can CT imaging support the transition to a more precise and outcome-oriented healthcare delivery?

“As radiologists, we now have the possibility to create value-based medicine by targeting the clinical end point of medical procedures: The recovery of the patient.”²⁴

Prof. Stefan Schönberg, MD,
University Medical Center Mannheim,
Mannheim, Germany



**SOMATOM
Force**

Get two steps ahead with Dual Source CT— the SOMATOM Force

Get two steps ahead in clinical excellence

At the top of our Dual Source CT portfolio, the SOMATOM Force enables new levels of image quality, clinical outcomes, and ultimately precision medicine. Examine patients without beta-blockers, with no need for them to hold their breath, while providing the ability to reduce contrast agent dosage. Make clearly quantified therapy evaluations with dose-neutral Dual Energy.

Get two steps ahead in workflow performance

Automated technologies support safe, standardized, and highly efficient workflows—allowing for appropriate dose and reproducible precision from the smallest to the tallest patients.

Get two steps ahead in expert leadership

Thinking beyond today, you're connected to the future with an ever-growing expert community, exclusive access to highest quality CT data in the market today and the tools to advanced your research and clinical practice.

Contents

At a glance	8
Three unique things with the SOMATOM Force	10
Get two steps ahead in clinical excellence	14
Get two steps ahead in workflow performance	36
Get two steps ahead in expert leadership	52
Technology overview	60
Additional products and services	62
About us	64

SIEMENS
Healthineers



SOMATOM Force



Get two steps ahead ...

... in clinical excellence

Achieve exceptional clinical and patient outcomes. Based on its industry-leading imaging chain, the SOMATOM Force supports high-precision diagnoses, reliable therapy response evaluation, and improved patient care for every individual.

... in workflow performance

Get exceptional, consistent images faster. The automated FAST Integrated Workflow supports reproducible image quality. High power, speed, and automated dose management help precisely adapt scanning parameters to any patient.

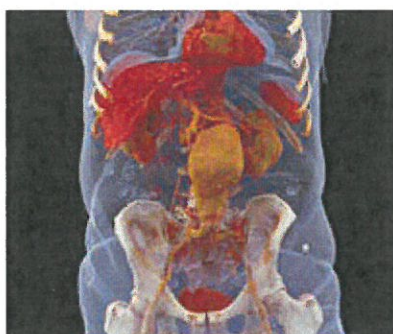
... in expert leadership

Help shape the future of healthcare today by spearheading medical innovation for tomorrow. As a member of the global SOMATOM Force community of clinical experts, you have access to the latest research tools and the highest quality of CT imaging data enabling new insight into how medicine can be practiced.



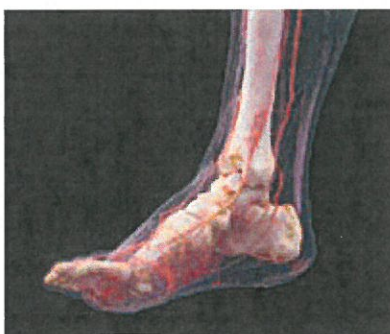
Three of the many things you can only do with the SOMATOM Force

There's a broad range of clinical capabilities you can achieve exclusively with the SOMATOM Force. Here are just three examples—enabling you to get two steps ahead.



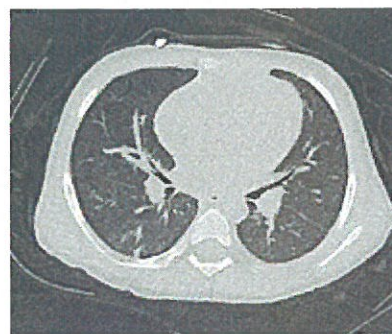
Uncompromised Spectral imaging

Cinematic VRT17 derived from a whole-body Dual Energy (DE) scan in the case of an occult ruptured aneurysm. Dual Energy improves visualization of iodine, potentially indicative of bleeding and extent of rupture. This is based on the better contrast-to-noise ratio of a low-keV contrast-media-enhanced scan.



4D CTA up to 80 cm for therapy planning

With scan coverage of up to 80 cm in dynamic angio, the SOMATOM Force can display challenging vascular situations like the one above, a case of peripheral vascular disease. Cinematic VRT from one phase is shown.



Free-breathing and ultra-low-dose imaging

High-quality ultra-low-dose imaging of the lung can be achieved using our unique Tin Filter technology and the industry's fastest scan speed (up to 737 mm/s) of the SOMATOM Force for virtually motion-free images, especially important for noncompliant children due to their higher vulnerability to radiation.

Precise and dose-neutral Dual Energy

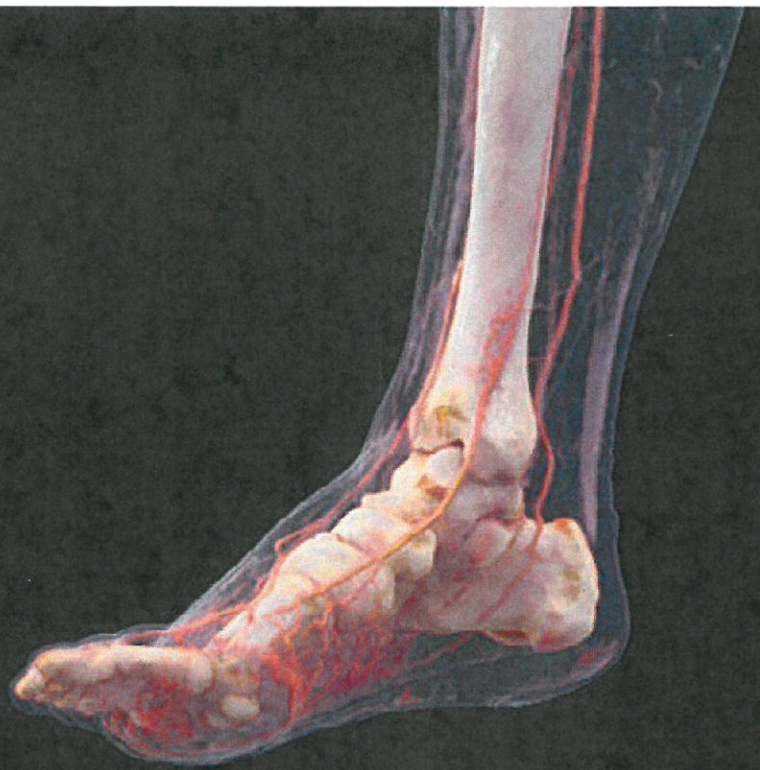
Courtesy of University of Tuebingen, Tuebingen, Germany

Uncompromised Spectral imaging

With selectable energy pairings and our unique Tin Filter technology, the SOMATOM Force enables new levels of energy separation in Spectral/Dual Energy scanning and therefore significantly increases precision and clinical impact.

The SOMATOM Force utilizes multiple pairings, 80-, 90-, and 100-/150-kV modes with tin (Sn) filtration using the Tin Filter: for example, for obese patients. 30 percent better energy separation means similar tissues can be differentiated more precisely, leading to increased diagnostic power in Dual Energy spectral imaging.

**4D imaging at
half the dose
compared with
other state of
the art CT
systems⁵**



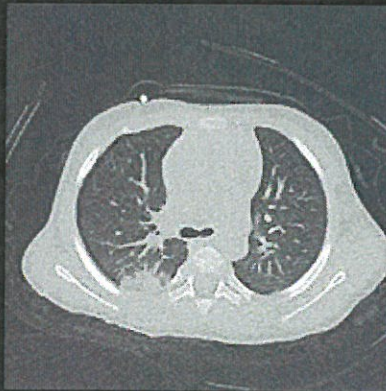
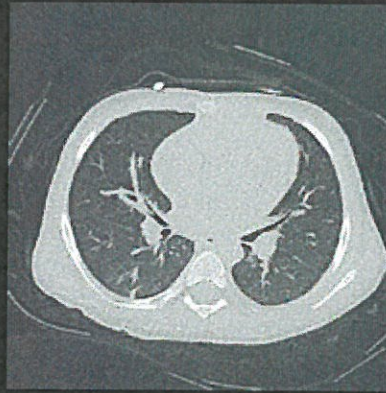
Courtesy of University Medical Center Mannheim,
Mannheim, Germany

Extended dynamic CTA up to 80 cm

Higher radiation exposures have previously been a stumbling block for broadening the application of functional imaging, especially body perfusion.

The SOMATOM Force significantly changes this paradigm, extending perfusion coverage to up to 22 cm for the brain and organs (for example, the liver) while significantly reducing the applied radiation dose. The system also allows for ultra-long-range dynamic CT angiographies of up to 80 cm.

Eff. dose
0.08 mSv



Courtesy of University of
Tuebingen, Tuebingen Germany

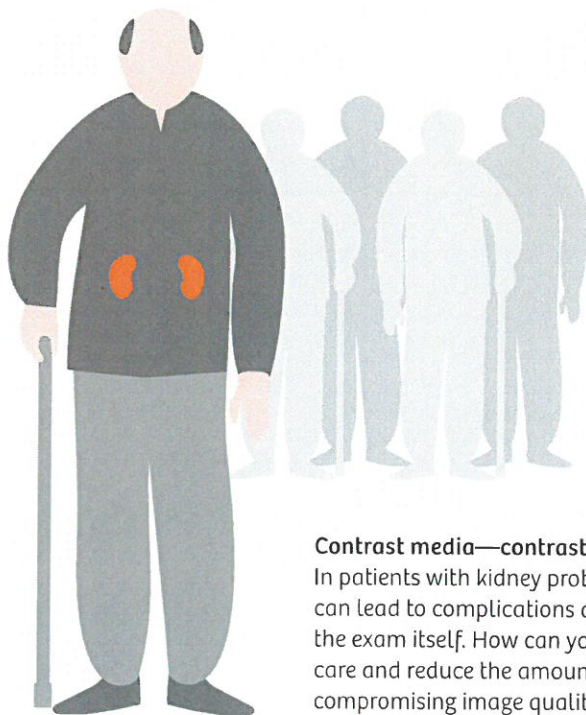
Free-breathing and ultra-low-dose imaging

A significant number of patients are unable to hold their breath or hold still due to their age or advanced disease state—for example, patients with COPD, trauma patients, or children, who can't follow your instructions.

The SOMATOM Force minimizes motion artifacts with its outstanding combination of high pitch volumetric acquisition (up to 737mm/s) and industry leading native temporal resolution (66 ms), allowing patients to breathe freely during thoracic and abdominal examinations. This speed helps minimize motion artifacts that otherwise impair image quality. In pediatric imaging, it may even help reduce the need for sedation.

How can you increase certainty and reduce risks?

New risks due to aging, comorbidities, kidney problems, or other factors are typical in societies undergoing demographic shifts. This can pose new challenges to CT scanning in terms of image quality, patient care, and decision-making.



20% have renal insufficiencies⁶

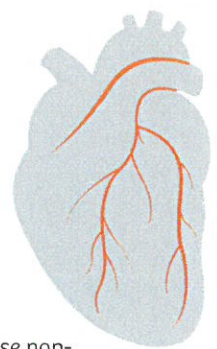
Contrast media—contrasting their own benefit

In patients with kidney problems, contrast media exams can lead to complications and push costs far higher than the exam itself. How can you safeguard excellent patient care and reduce the amount of contrast media without compromising image quality?

FFR_{CT} requires exquisite image quality

Going for non-invasive alternatives

One way to reduce risks in cardiology is to choose non-invasive alternatives like CT-derived FFR⁷. However, its application is absolutely dependent on very high CT image quality. How can you maximize this quality?



Get two steps ahead in clinical excellence

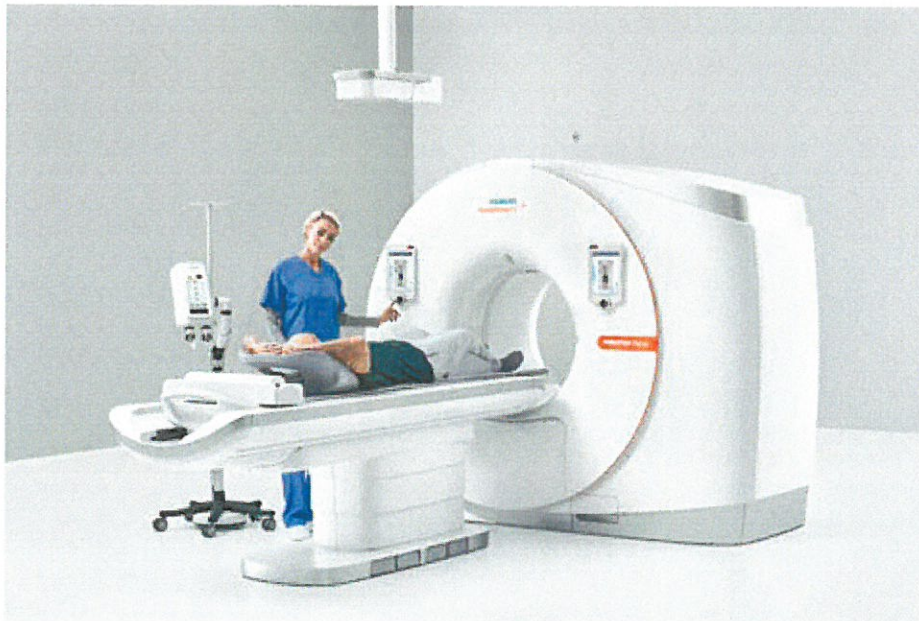


Designed to achieve exceptional clinical and patient outcomes. Based on its industry-leading imaging chain, the SOMATOM Force supports high-precision diagnoses, reliable therapy response evaluation, and improved patient care for every individual.

Bring image quality to the next level—with free-breathing and powerful imaging

Free-breathing imaging

Motion blur and unwanted artifacts can obscure details and degrade diagnostic image quality. With the SOMATOM Force, you can significantly improve image quality, helping prevent rescans and reduce uncertainty due to artifacts.



More patients, less motion

The purpose of breathing commands is simple: to avoid movement to reduce motion artifacts. Unfortunately, a significant number of patients simply can't hold their breath even for a few seconds. Obese, elderly, unconscious, or uncooperative patients are either not scanned, need to be sedated, or are scanned with results that are ultimately unusable for diagnosis. By providing the industry's highest native temporal resolution and fastest volumetric acquisition speed, the SOMATOM Force helps to minimize motion artifacts even in these challenging cases.

Better preparation, reduced complications

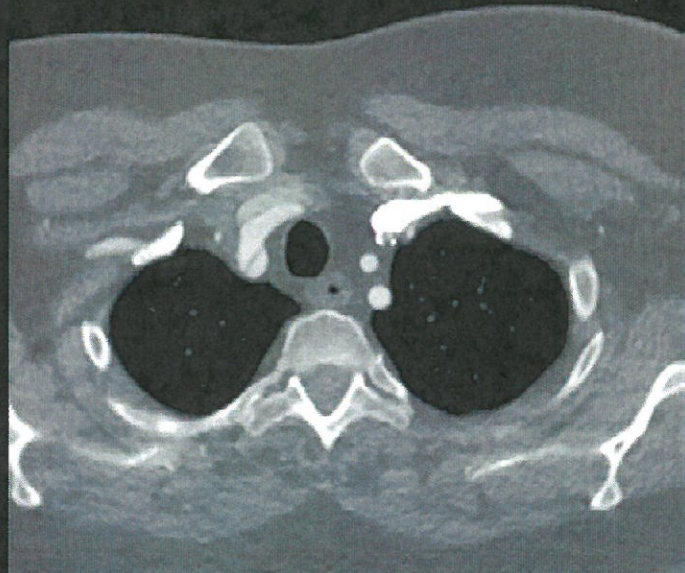
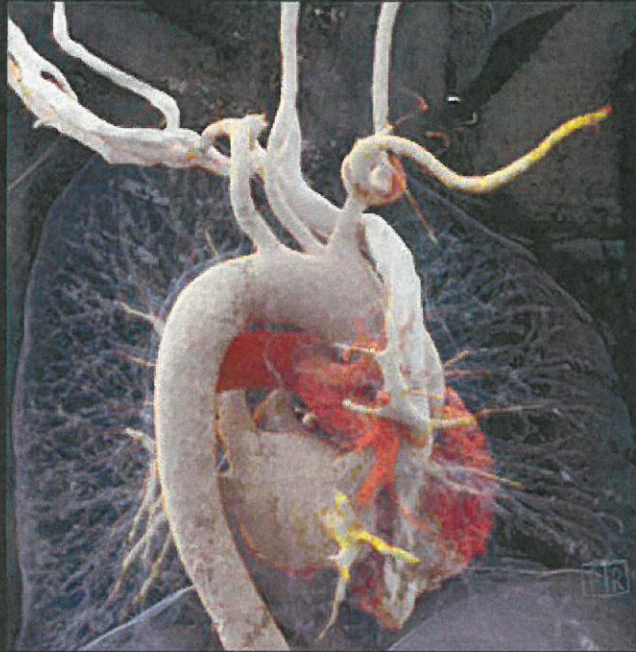
Scanning with a native temporal resolution high enough for patients to breathe freely provides significant clinical benefits. Thanks to the SOMATOM Force's extended coverage, you can scan an entire heart in approximately 150 ms. Combining an acquisition speed of up to 737 mm/s and a generator power of up to 2×120 kW, the SOMATOM Force facilitates freezing motion at outstanding image quality for patients of all sizes.

**Speed
733 mm/s**

Turbo Flash scan catching the details in CTA—
right subclavian artery dissection

Collimation: $2 \times 192 \times 0.6$ mm
Pitch: 3
Scan time: 0.53 s
Scan length: 366 mm
Rotation time: 0.25 s
Tube settings: 80/80 kV, 150 mAs
CTDI_{vol}: 2.20 mGy
DLP: 94.6 mGy cm
Eff. dose: 1.32 mSv

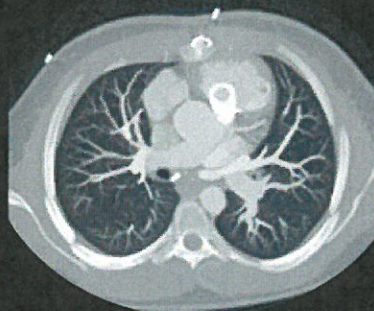
Turbo Flash mode at up to 737 mm/s minimize
breathing and motion artifacts. When combined
with the Vectron™ tubes, dose levels can be
reduced to a minimum.



**Native
temporal
resolution
66 ms**

Cardiac imaging—14-year-old adolescent

Collimation: $2 \times 192 \times 0.6$ mm
Pitch: 3.2
Scan time: 0.41 s
Scan length: 303 mm
Rotation time: 0.25 s
Tube settings: 80 kV, 424 mAs
CTDI_{vol}: 1.95 mGy
DLP: 67.1 mGy cm
Eff. dose: 0.94 mSv
HR: 65 bpm

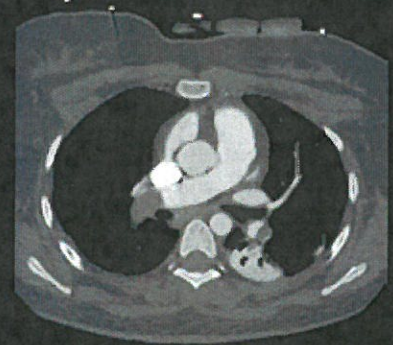
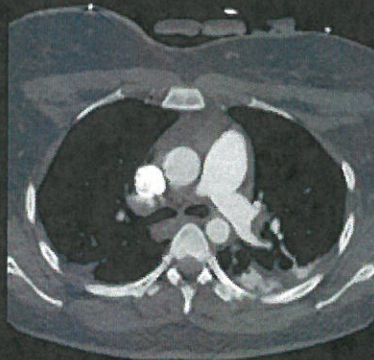


Courtesy of University Hospital Calmette, Lille, France

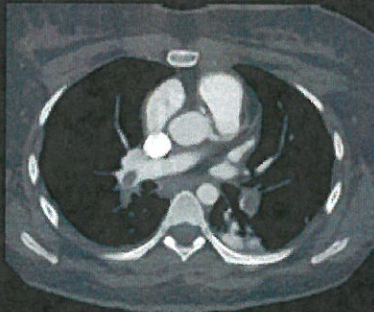
Scan time
0.31 s

Turbo Flash scan at 142 bpm—pulmonary embolism and RCA of abnormal origin

Collimation: $2 \times 192 \times 0.6$ mm
Pitch: 3.2
Scan time: 0.31 s
Scan length: 236 mm
Rotation time: 0.25 s
Tube settings: 90 kV, 617 mAs
DLP: 120 mGy cm
CTDI_{vol}: 4.31 mGy
Eff. dose: 1.6 mSv
HR: 142 bpm
CM: 80 mL

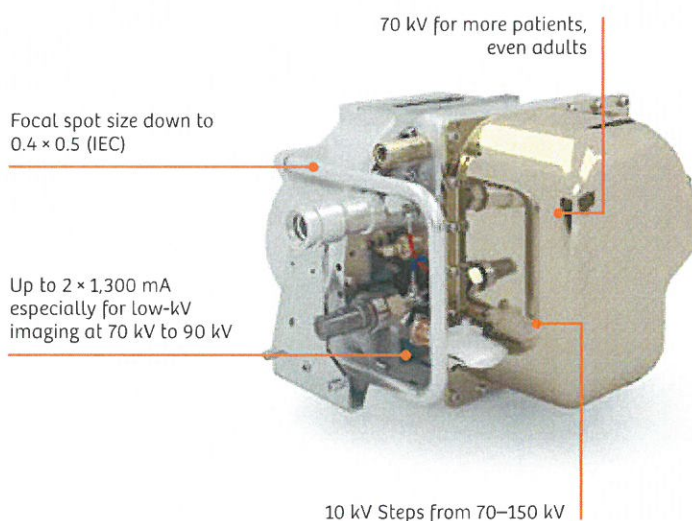


Vectron tubes combined with Stellar^{Infinity} detectors offer 10 kV steps from 70–150 kV. In this case, a contrast-media-enhanced CT to diagnose the emboli and abnormalities of the coronaries in one scan was performed with 90 kV. Image quality shows perfect details with excellent contrast media enhancement.



Powerful imaging

When the smallest details count—like in the inner-ear and bone imaging, or for stent visualization—the quality of the entire imaging chain is essential. With its powerful Vectron™ X-ray tubes, precision focal spot and the highly sensitive Stellar^{Infinity} detectors, the SOMATOM Force is the ideal scanner for high-speed, large-volume coverage at outstanding image quality.



Unique power, gentle scans

The SOMATOM Force significantly improves spatial resolution in clinical routine thanks to a fine-tuned combination of solutions: Data acquisition uses the small focal spot of the Vectron™ X-ray tube with a power-independent focal spot size; the small detector apertures of the Stellar^{Infinity} detector combined with the in-plane and z-axis flying focal spot enable excellent in-plane and through-plane sampling. With ADMIRE⁹, clinical images will also benefit from higher resolution at organ borders and improved edge delineation at up to 60 percent less dose.⁹ Increased spatial resolution may be beneficial in inner-ear and bone imaging and CT angiographic studies, particularly for the visualization of very small vessels like the coronary arteries.

⁹In clinical practice, the use of ADMIRE 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 ADMIRE 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 ADMIRE showed the same image quality compared to full dose data based on this test. Data on file.

Unique performance parameters

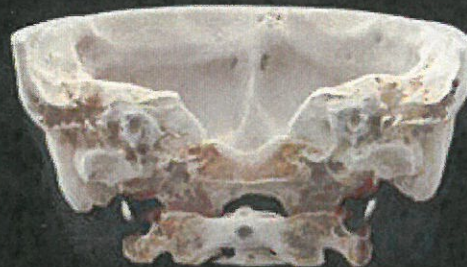
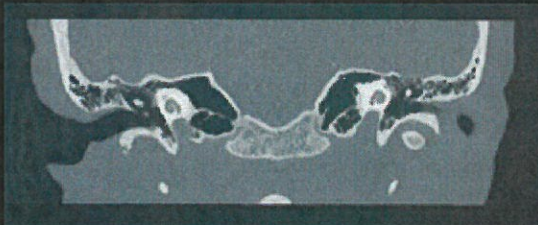
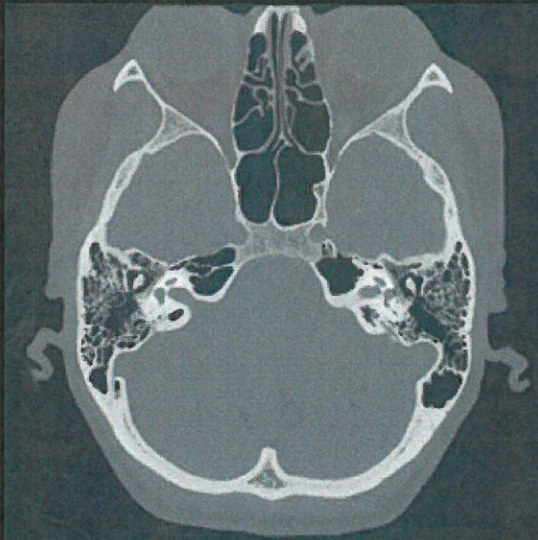
The Vectron™ X-ray tube and the corresponding high-power generator offer unique performance parameters. Thanks to the efficient electron catcher, the tube's focal spot is very small, achieving a size of a mere 0.4 × 0.5 (IEC). The focal spot typically spreads at a high X-ray tube power, which negatively impacts the spatial resolution and image contrasts. The SOMATOM Force overcomes this challenge by maintaining its focal spot size—and accordingly, the spatial resolution—practically independent of the kV setting, even at very high tube power.

Ultra-high-resolution (UHR) mode—mid and inner ear with detailed bony structures and the ossicles

Collimation: 44×0.6 mm
Scan time: 3.51 s
Scan length: 57.2 mm
Rotation time: 1 s
Tube settings: 90 kV, 132 mAs
CTDI_{vol}: 8.69 mGy
DLP: 109.9 mGy cm
Eff. dose: 0.2 mSv

Small
focal spot
size
 0.4×0.5
(IEC)

Outstanding image detail: The very small focal spot enabled by the Vectron™ X-ray tube, in conjunction with UHR mode, make it possible to display very fine bone structures.



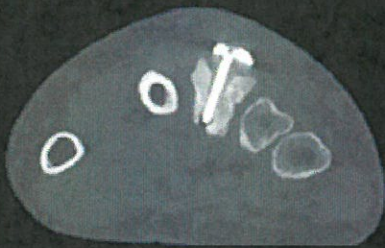
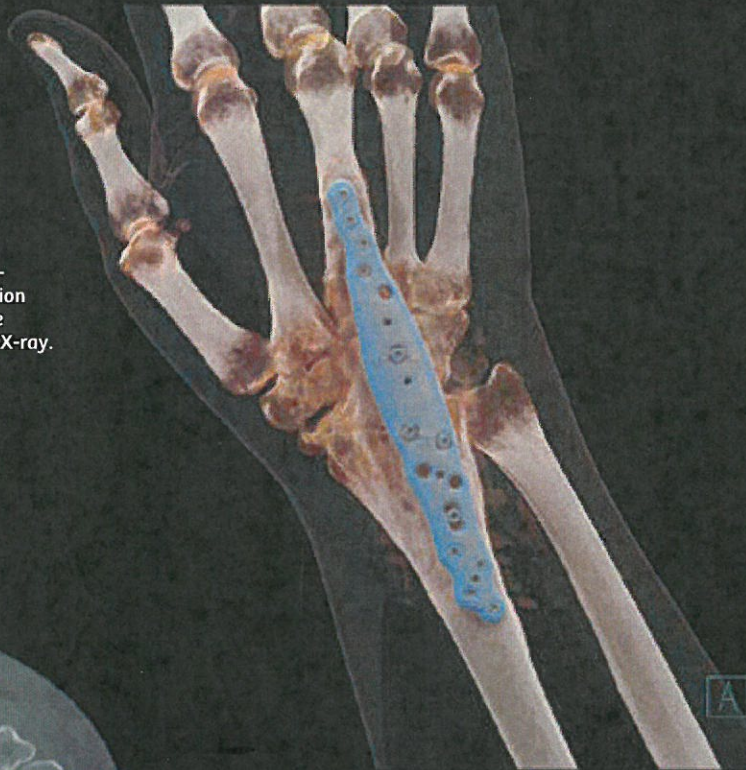
Courtesy of Carolinas Medical Center, Charlotte, North Carolina, USA

Precise
metal artifact
reduction

Ultra-high-resolution (UHR) mode—complex wrist fracture with fixation

Collimation: 64×0.6 mm
Scan time: 9.6 s
Scan length: 185 mm
Rotation time: 1.0 s
Tube settings: 120 kV, 82 mAs
CTDI_{vol}: 4.75 mGy
DLP: 95 mGy cm
Eff. dose: 0.08 mSv

High-resolution bone imaging: Ultra-high-resolution mode achieves 0.4 mm resolution to enable the fine depiction of small bone structures at dose levels of conventional X-ray.



Scan time
0.18 s

Follow-up of a 57-year-old male patient who had suffered from a left coronary artery stenosis

Collimation: $2 \times 192 \times 0.6$ mm
Scan time: 0.18 s
Scan length: 129.3 mm
Rotation time: 0.25 s
Tube settings: 100 kV, 500 mAs
CTDI_{vol}: 4.95 mGy
DLP: 84.2 mGy cm
Eff. dose: 1.2 mSv
HR: 57 bpm

Thanks to a temporal resolution of 66 ms and an isotropic resolution of 0.3 mm, the SOMATOM Force allows excellent visualization of coronaries and stents.



Improve patient care & safety with reduced contrast usage & ultra-low-dose scanning

With an aging population, chronic kidney diseases are on the rise, creating a need for better care and more effective treatments. Reducing contrast agent dosage can improve patient safety.



Lower kV, more protection

The SOMATOM Force allows you to routinely perform exams at 70–90 kV, even for adults. This may reduce the quantity of contrast media required and can improve patient safety.

Less risk, more savings

In some cases, patients must be hospitalized in order to undergo prescan care or aftercare following a contrast scan. These procedures can be time-consuming and have the potential to cost much more than the CT examination itself. Reducing the quantity of contrast media can lead to significant improvements in clinical results and patient well-being.



Prof. Gabriele Krombach, M(H)BA,
Head of Diagnostic and
Interventional Radiology,
University Giessen-Marburg,
Germany

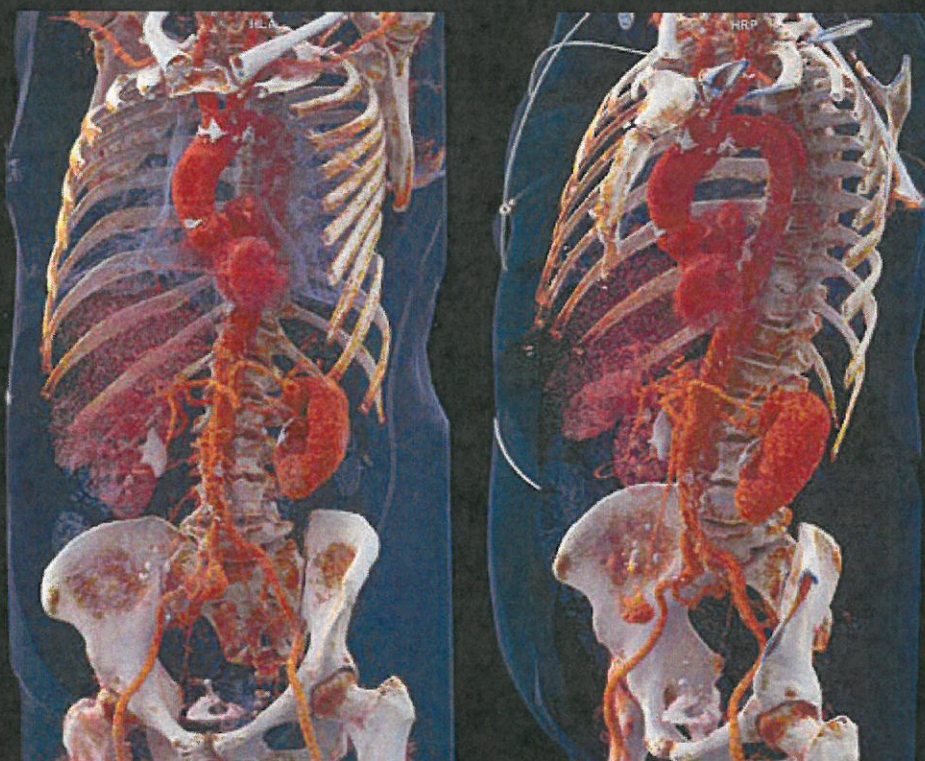
"In our first week using the SOMATOM Force, we not only saved contrast media in CT angiographies and thorax/abdomen CT—we also scanned three peds without sedation."²⁴

20 mL
contrast
media

Turbo Flash mode supporting improved patient safety through contrast media reduction
e.g., in aortic dissection.

Collimation: $2 \times 192 \times 0.6$ mm
Pitch: 3.2
Scan time: 1.07 s
Scan length: 740 mm
Rotation time: 0.25 s
Tube settings: 80/80 kV, 140 mAs
CTDI_{vol}: 2.09 mGy
DLP: 154.6 mGy cm
Eff. dose: 2.32 mSv
CM: 20 mL

Low-kV imaging with Vectron™ tube:
The innovative tube design with small
focal spots and high power reserves
allows contrast media to be reduced to
extremely small amounts while
improving image contrast-to-noise ratio.



Ultra-low-dose scanning

With conventional CT, doses can be too high and results too uncertain for successful early detection—for example, of occult lesions in the lung. The SOMATOM Force provides significantly optimized dose efficiency, which enables ultra-low-dose imaging of a growing number of high-risk, asymptomatic individuals.



Michel Nemery,
Head of the Radiology Department,
Herlev and Gentofte Hospital,
Denmark

*"The SOMATOM Force
is accurate, fast,
and gentle."²⁴*

Lower dose, earlier diagnoses

The SOMATOM Force comes with the unique Tin Filter technology, which shields your patients from clinically irrelevant low-energy radiation. The result: You can deliver excellent results at dose levels comparable to conventional X-ray—for example, in non-contrast studies like lung screening as well as orthopedic and sinus scanning. The Tin Filters can also be used for other types of exams, including topograms and calcium scoring, that you can now perform at previously unknown low dose levels.

Clear advantages, clinically approved

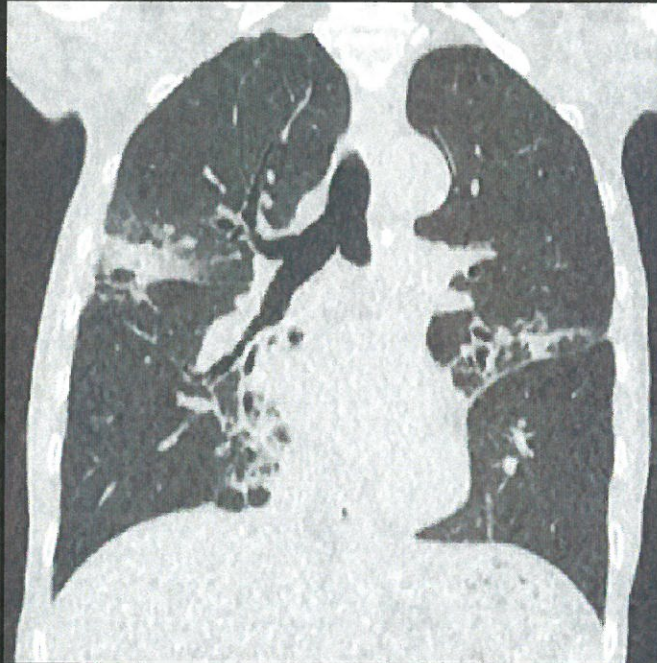
A recent clinical study confirms the advances in low-dose scanning with the SOMATOM Force, stating that the visualization of pulmonary nodules "... can be performed with third-generation Dual Source CT producing high image quality, sensitivity, and diagnostic confidence at a very low effective radiation dose of 0.06 mSv when using a single-energy protocol at 100 kVp with spectral shaping and when using advanced iterative reconstruction technique."¹⁰

Eff. dose
0.04 mSv

Ultra-low-dose scan with Tin Filter and Turbo Flash mode—bilateral pneumonia

Collimation: $2 \times 192 \times 0.6$ mm
Pitch: 3.2
Scan time: 0.45 s
Scan length: 311 mm
Rotation time: 0.25 s
Tube settings: Sn100 kV, 24 mAs
CTDI_{vol}: 0.09 mGy
DLP: 2.8 mGy cm
Eff. dose: 0.04 mSv
Slice width: 1.5 mm

Detailed images: High spatial resolution enables excellent visualization of pneumonia even at extremely low dose levels. Tin Filters allow for lung scans at extremely low dose levels.



Courtesy of Bautou Central Hospital, Bautou, PR China

Boost your diagnostic confidence— with 4D imaging at half the dose and dose-neutral Dual Energy

4D imaging

With diagnoses often stuck in a compromise between not using additional dose and having greater clinical insight, the option to deliver high-quality yet dose-efficient 4D imaging can help you make decisions more confidently without compromising patient safety.



Proper diagnoses, precise decisions

4D imaging adds functional information to morphology. With its Stellar^{Infinity} detectors, the SOMATOM Force enables body perfusion suitable for use in clinical practice. The increased coverage allows for a perfusion range of up to 22 cm, which easily covers entire organs. The key to bringing this breakthrough into everyday use is the full electronic integration of the Stellar^{Infinity} detectors and the Adaptive Dose Shield. Together they enable up to 50 percent dose reduction in 4D imaging compared with other state-of-the-art CTs.

Accurate results, appropriate therapies

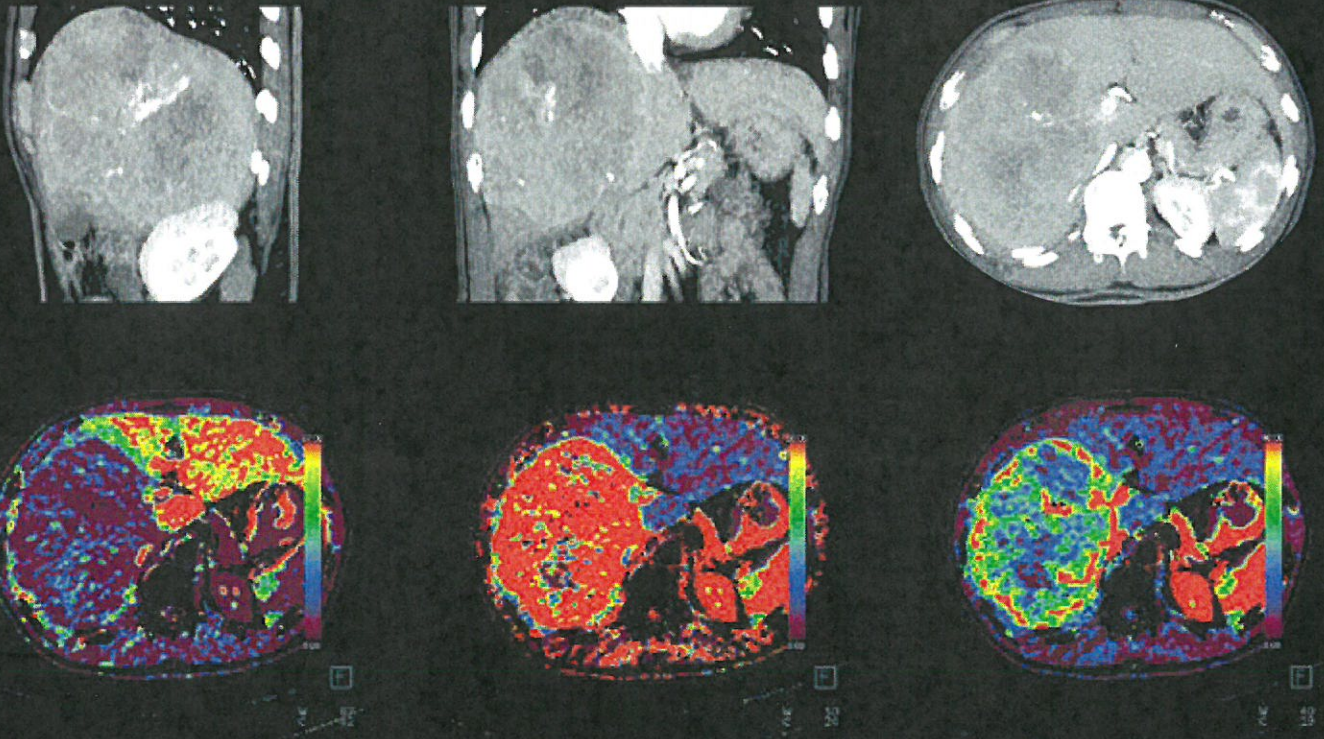
Another demand on performing with multi-phase exams is how to best optimize contrast bolus timing and execution. With the SOMATOM Force, you can switch from multi-phase to dynamic 4D studies. Besides being more cost-effective, 4D functional information allows increased precision in disease assessment and supports accurate clinical decisions. Patients can benefit from highly precise visualization of lesions, as well as the planning and follow-up for the associated therapies. This can help reduce overall healthcare spending and enable individual institutions to free up resources.

Coverage
294 mm

Volume perfusion of the liver at 70 kV

Collimation: 48×1.2 mm
Scan time: 28.5 s
Scan length: 294 mm
Rotation time: 0.25 s
Tube settings: 70 kV, 189 mAs
CTDI_{vol}: 48.17 mGy
DLP: 1015.7 mGy cm
Eff. dose: 15.24 mSv

Whole liver volume perfusion enhanced by the SOMATOM Force at 70 kV results in superior contrast-to-noise ratio and lower radiation dose compared with conventional perfusions exams.



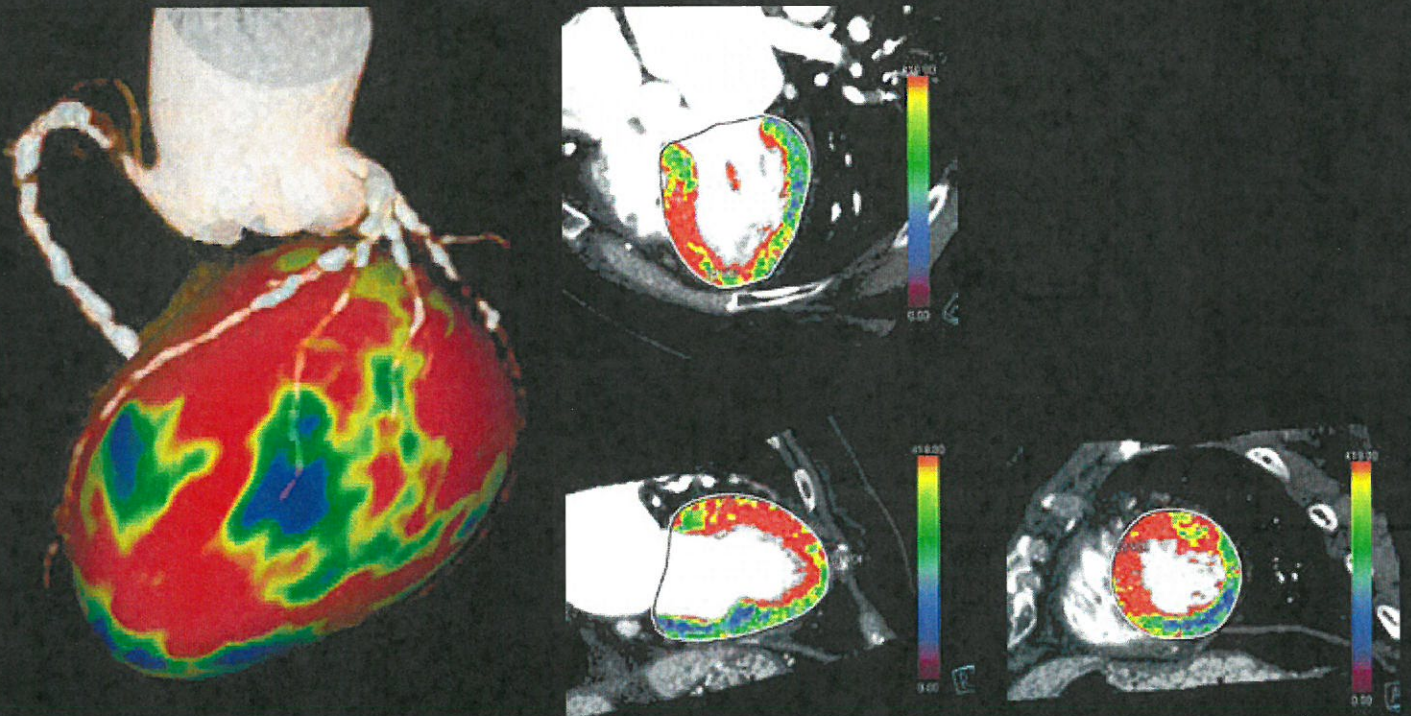
Courtesy of Peking University Medical College, Beijing, PR China

70 kV

Dynamic myocardial stress perfusion—combining diagnostic and functional imaging at low dose

Collimation: 192 × 0.6 mm
Scan time: 33.41 s
Scan length: 104.3 mm
Rotation time: 0.61 s
Tube settings: 70 kV, 275 mAs
CTDI_{vol}: 43.08 mGy
DLP: 455.0 mGy cm
Eff. dose: 6.37 mSv
HR: 85–92 bpm

Assessment of myocardial perfusion requires efficient use of radiation dose and high temporal resolution to cover broad range of heart rates.



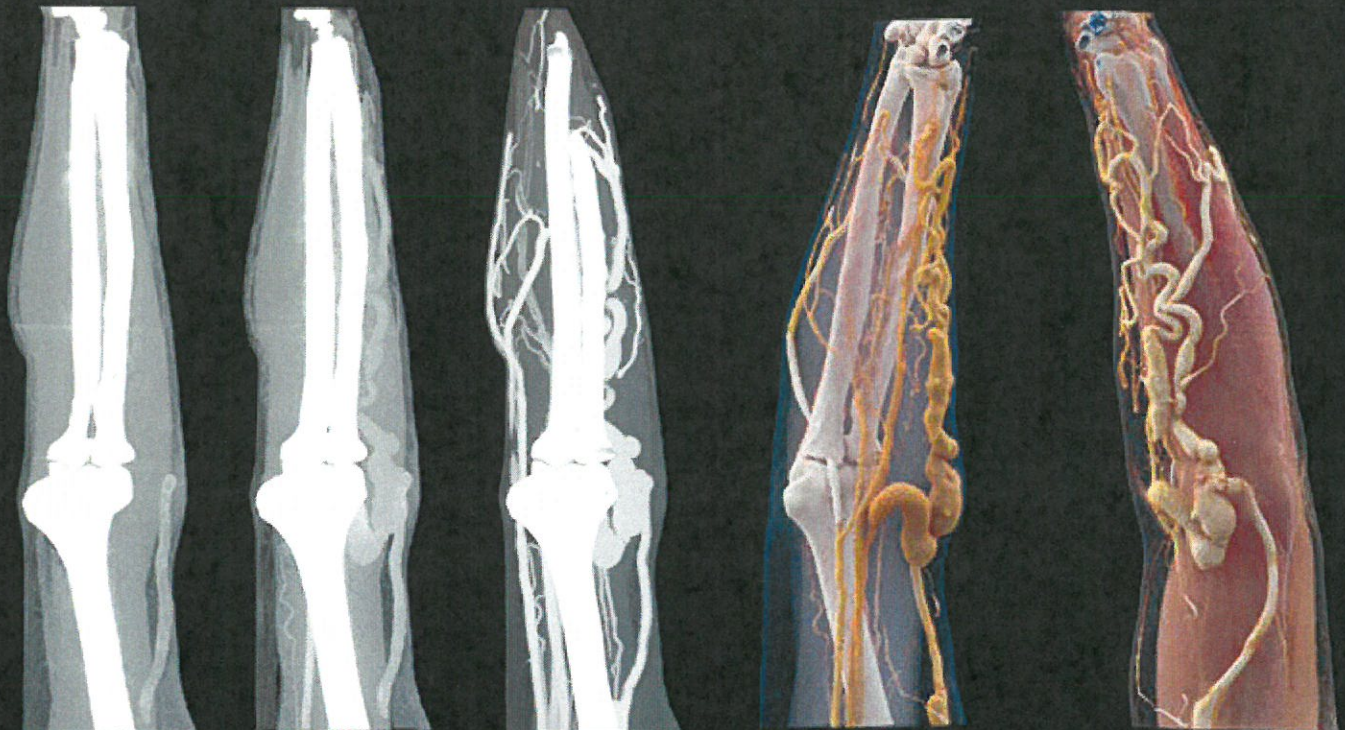
Courtesy of Peking University Medical College, Beijing, PR China

Coverage
433.2 mm

Extended dynamic imaging of peripheral vessels

Collimation: 192 × 0.6 mm
Scan time: 47.1 s
Scan length: 433.2 mm
Rotation time: 0.25 s
Tube settings: 70 kV, 80 mAs
CTDI_{vol}: 23.57 mGy
DLP: 1404 mGy cm
Eff. dose: 1.12 mSv

Complex vascular pathology benefits from dynamic information to help reveal underlying complexity. As shown in this example, 4D CTA imaging was applied to visualize the consequences of a shunt occlusion.



Courtesy of University Medical Center Mannheim, Mannheim, Germany

Precise and dose-neutral, spectral imaging with Dual Source Dual Energy (DS DE)

The reliable evaluation of patient-specific therapies can significantly improve patient outcomes and prevent costly, ineffective treatment. Precise and dose-neutral quantification helps you generate high-quality diagnostic results.



More information, better outcomes

In recent years, Dual Energy CT has found its way into clinical routine, adding tissue and material information to morphology. Various studies have shown the potential for reducing the need for follow-up imaging. By further increasing sensitivity and specificity, the SOMATOM Force pushes Dual Source Dual Energy to a new level. Improved DE acquisition speeds of up to 258 mm/s and a much broader range of applications, for example, for obese patients, permit a more precise differentiation of tissue types in oncology, cardiovascular, and acute-care cases.

Saved time, increased usage

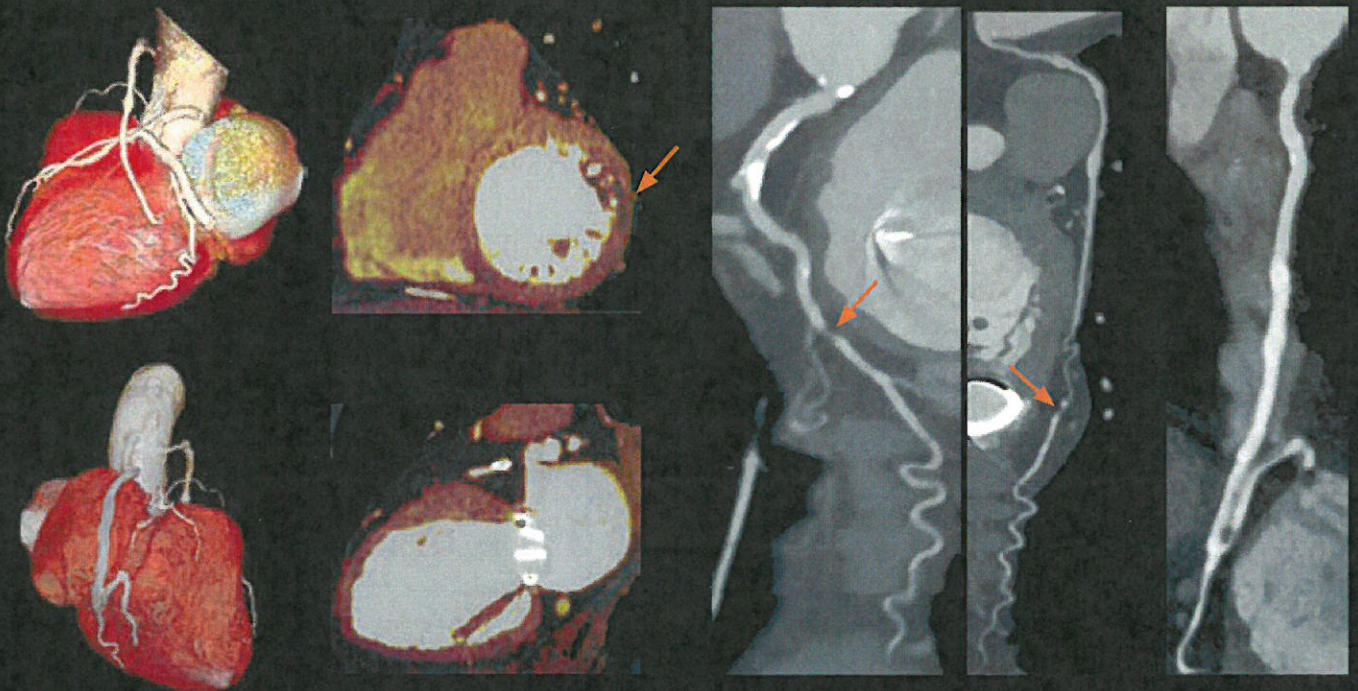
Waiting to see whether a chosen therapy is effective can be costly and time-consuming; you risk wasting resources on unnecessary treatments. Reliable information about tissue and material decomposition may enable a faster evaluation of therapy response. By making DE quantification more precise and accessible, the SOMATOM Force takes CT two steps ahead as a decision support tool—in line with the goals of value-based healthcare.

Dual Energy
pairing
90/Sn150 kV

Precise Dual Energy tissue differentiation—cardiac PBV—coronary stenosis and bypasses

Collimation: $2 \times 128 \times 0.6$ mm
Scan time: 10.9 s
Scan length: 208.4 mm
Rotation time: 0.25 s
Tube settings: 90/Sn150 kV, 128/108 mAs
CTDI_{vol}: 10.99 mGy
DLP: 230.9 mGy cm
Eff. dose: 3.23 mSv
HR: 53–58 bpm

Advanced diagnostic information with DE:
With a single scan, both CTA and myocardium
PBV information are acquired with no dose
penalty for DE acquisition.



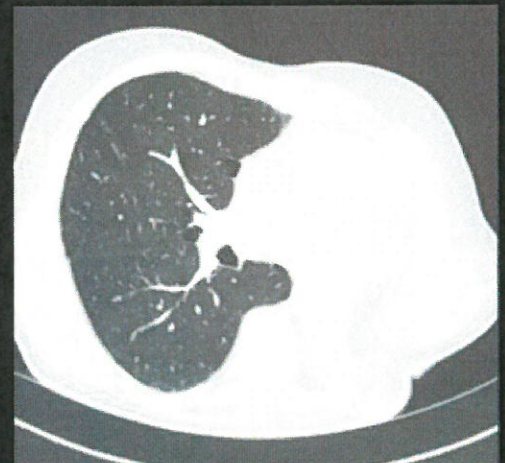
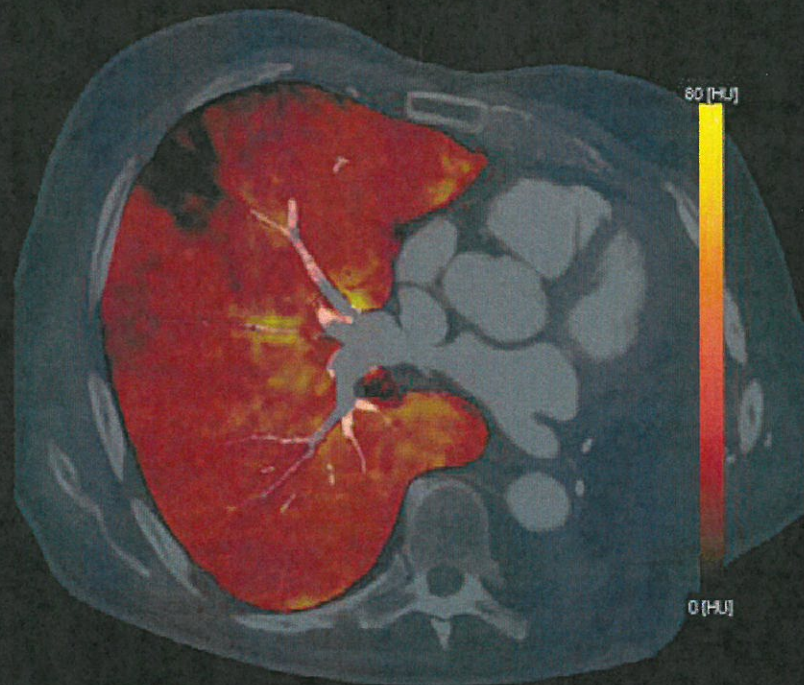
Courtesy of MUSC Medical Center, Charleston, USA

Dual Energy
pairing
80/Sn150 kV

Precise Dual Energy tissue differentiation—lung perfusion

Collimation: 2 × 128 × 0.6 mm
Scan time: 4.12 s
Scan length: 355 mm
Rotation time: 0.25 s
Tube settings: 80 kV/Sn 150kV, 115/70 mAs
CTDI_{vol}: 7.78 mGy
DLP: 298.7 mGy cm
Eff. dose: 4.18 mSv

Understanding lung function is an essential clinical task in cases of suspected pulmonary embolism and other pulmonary pathologies. In the case shown, the high speed of the Dual Source technology was used to visualize the degree of perfusion defects after resection of the left lung for tumor treatment. The combination of high in-plane and best spectral separation of the DE scan result in artifact-free and reliable perfusion mapping, even when imaging is a challenge.



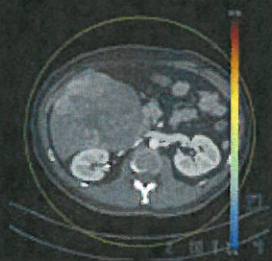
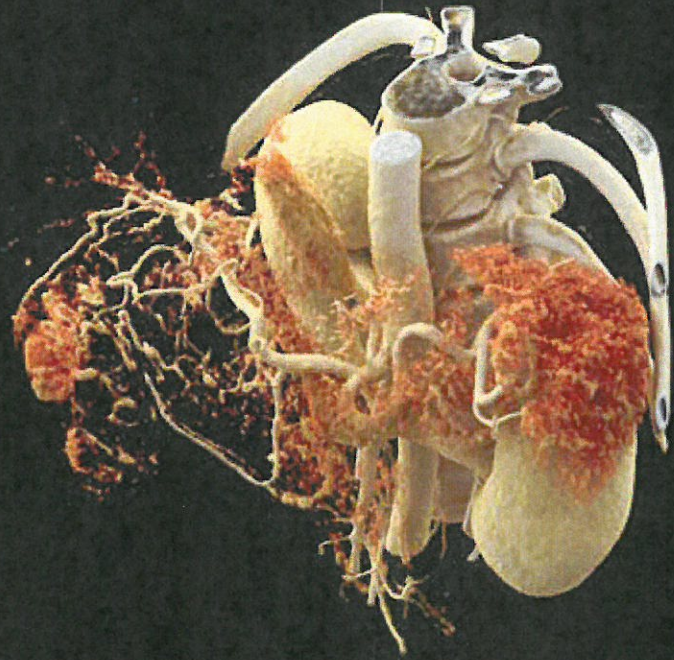
Courtesy of University Hospital Calmette, Lille, France

Eff. dose
1.95 mSv

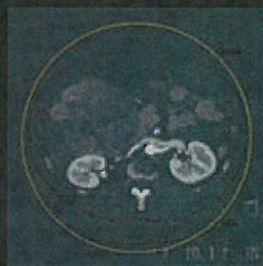
Precise Dual Energy tissue differentiation—Liver lesion

Collimation: $2 \times 128 \times 0.6$ mm
Pitch: 0.6
Scan time: 6.85 s
Scan length: 315 mm
Rotation time: 0.5 s
Tube settings: 80/Sn150 kV, 124/65 mAs
CTDI_{vol}: 4.58 mGy
DLP: 130.23 mGy cm
Eff. dose: 1.95 mSv

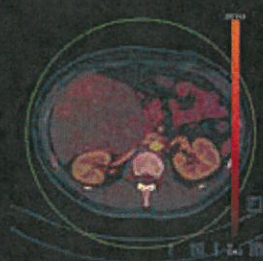
Cinematic VRT derived from information of the iodine map showing the vascularization of the lesion.



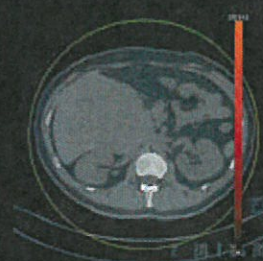
Contrast-enhanced
120-kV-equivalent image



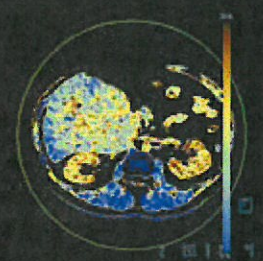
Iodine map



Overlay iodine map/
virtual non contrast-
enhanced image



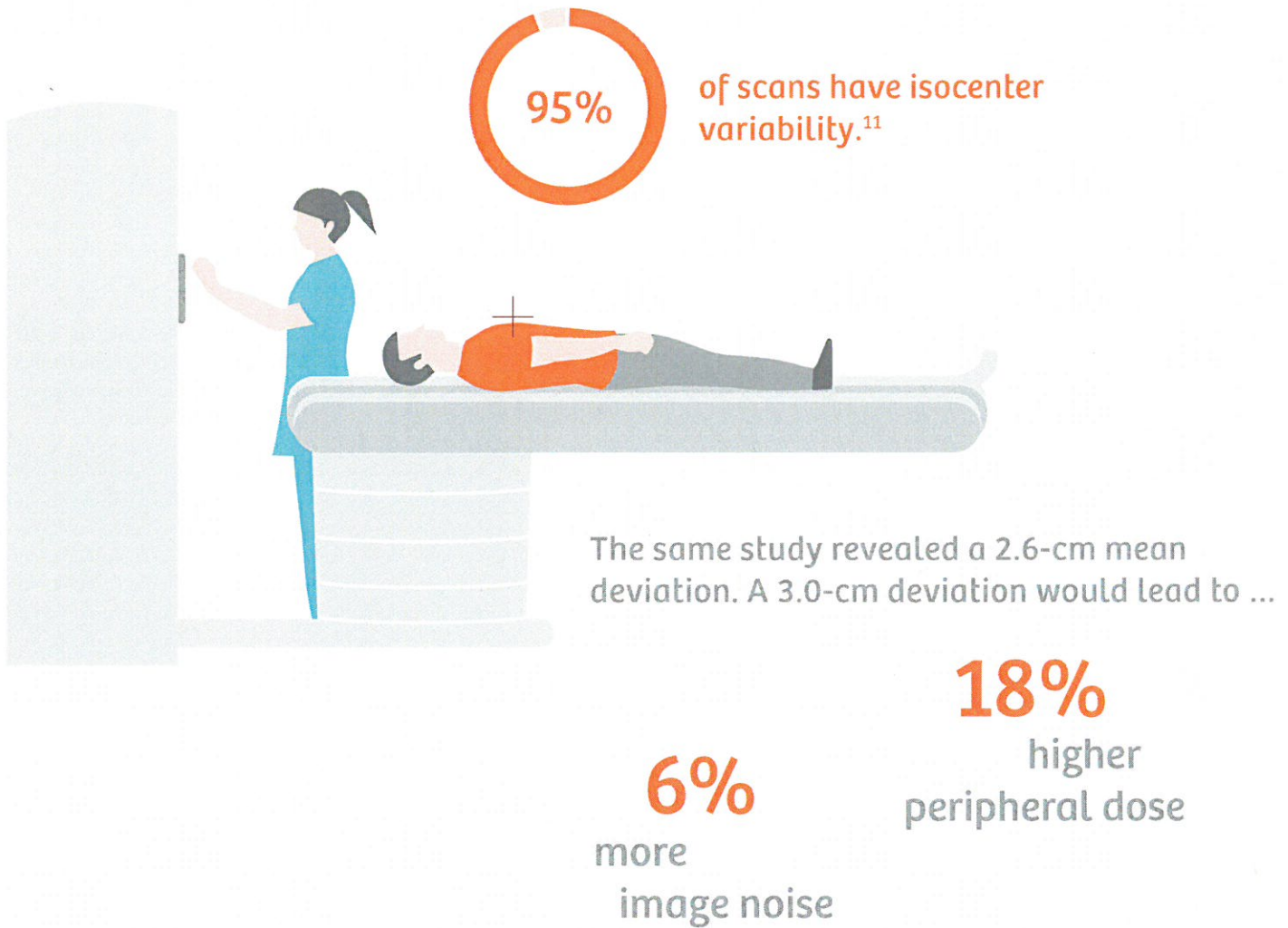
Virtual non-contrast-
enhanced image



FAT map

What's the price of insufficient planning and patient positioning?

High-quality images begin with accurate planning and patient positioning. Precision and consistency can be compromised due to time pressures and staff constraints, as well as also increasing dose and affecting image quality that can potentially lead to non-reimbursed rescans.



Get two steps ahead in workflow performance



Save time and achieve consistent results—with intelligent automation for fast and precise patient positioning, scanning, and postprocessing.

Position patients precisely— with FAST Integrated Workflow

Accurate patient positioning is essential for safe, error-free CT imaging. However, users are as unique as their patients, and even the most experienced users are affected by long hours and increased pressure. With its game-changing FAST Integrated Workflow, the SOMATOM Force helps technologists acquire the right body region at the right dose—in a reproducible way.

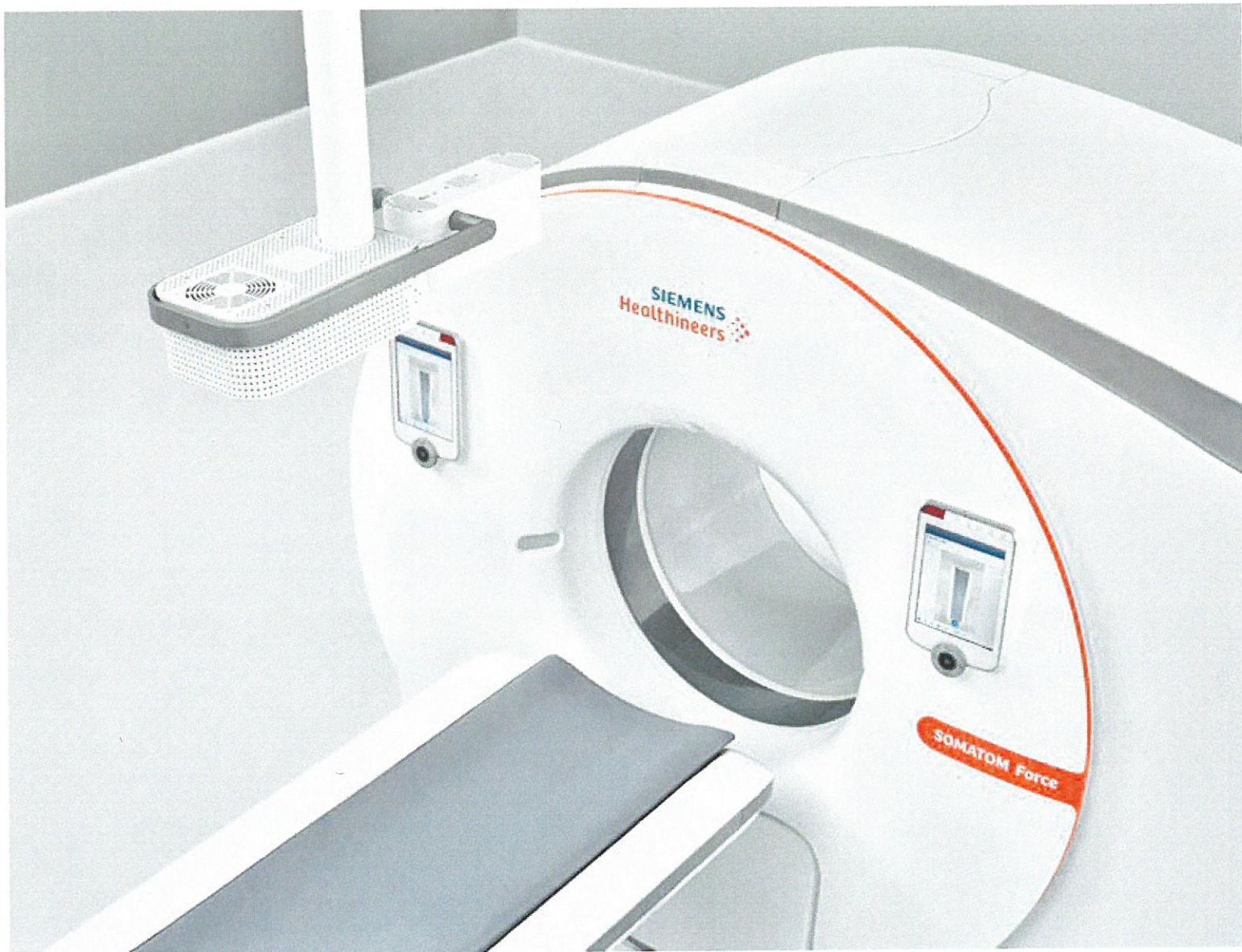


Precise position—precise quality and dose

The world's first FAST 3D Camera in conjunction with FAST applications helps your team provide the right scans the first time, manage tight schedules, and potentially examine more patients.

Get closer to your patients

At the same time, with the Touch Panels, technologists can provide instruction and assistance much closer to patients. Considering the growing pressures on healthcare providers, this could enhance patient cooperation, staff satisfaction, and even your institution's reputation.



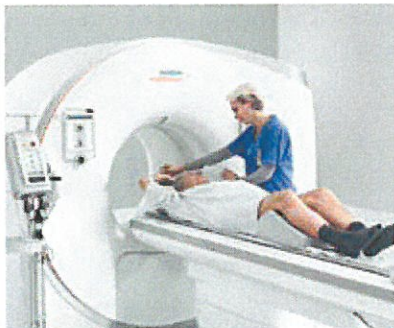
“Special attention must be paid to correct patient centering in order to optimize organ doses and image quality of the respective CT examination.”^{13,24}

Saltybaeva N, Alkadhi H;
Vertical Off-Centering Affects Organ Dose in Chest CT

Make precise positioning your standard

FAST Integrated Workflow

With the SOMATOM Force and its FAST Integrated Workflow, you can push workflow automation and standardization to a new level—and in parallel care for your patients more individually.



Starting with 3D measurement

“You can only improve what you can measure”—the SOMATOM Force gives truth to the old saying:

- FAST 3D Camera captures the patient’s shape, position, and height in three dimensions
- Using infrared measurement, it even recognizes body contours; this is particularly useful when, for example, patients are wearing thicker clothes



Calculating with accuracy

Algorithms use the measured data to calculate:

- The body regions in z-direction
- The patient’s direction—“head-first versus feet-first” as well as “prone or supine”
- The table height and patient thickness



Automating precision

Specialized applications support accurate and reproducible positioning:

- FAST Isocentering, at the push of a button, provides the correct isocenter position, enabling the right dose modulation and consistent images
- FAST Range supports scanning the correct body region with no truncation by aligning the automatically identified anatomical position with the protocol
- FAST Direction helps safeguard the right scan direction, which is crucial when moving the table with infused patients
- FAST Topo enables faster scan speeds in topograms, which prevents breath-hold artifacts. It also has the potential to decrease the topogram dose

Unique combination of solutions



FAST 3D Camera
powered by FAST
Integrated Workflow

+



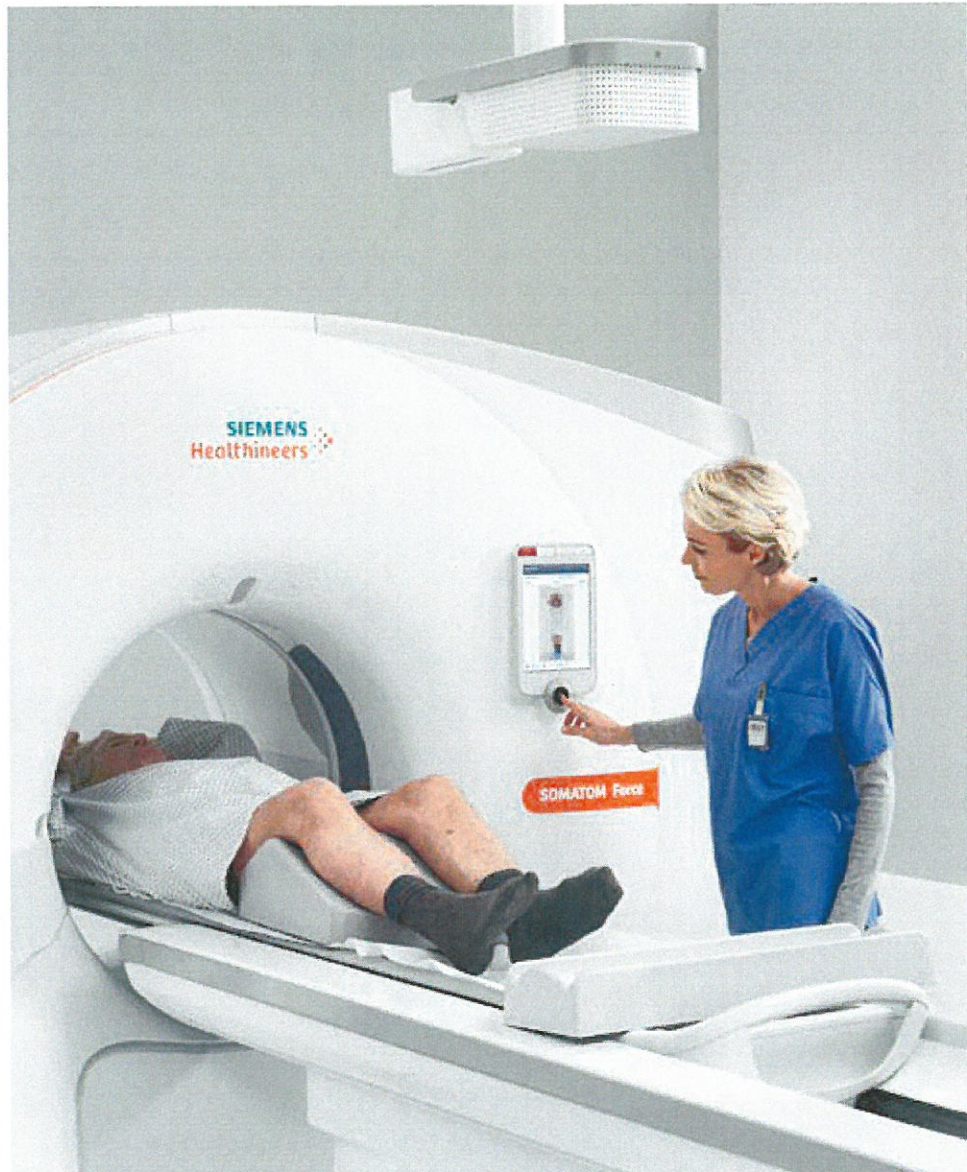
Touch Panels
powered by FAST
Integrated Workflow



Staying in control—closer to your patients

Technologists can improve patient interaction with two front-side and two optional back-side Touch Panels:

- This allows technologists to set and control all parameters while staying in touch with the patient
- Protocol selection and patient positioning become more simple and precise
- With FAST ECG Check, patient variables with ECG impedance are ruled out allowing for the most accurate ECG signal for each patient



Accommodate the smallest to the tallest—with personalized scanning

No two patients are the same, and some aren't easy to scan—but referring physicians and ordering clinicians always expect precise results. With its outstanding speed, power reserves, and sensitivity, the SOMATOM Force adapts to every need. At the same time, intelligent automation adjusts scan parameters to each patient size and shape.



Prof. Konstantin Nikolaou, MD,
Director of the Department of Diagnostic
and Interventional Radiology,
University Hospital Tuebingen, Germany

“Every patient now gets a personalized scan. Depending on age, body weight, and clinical indication, we can achieve dose levels far below the standard values.”²⁴



Catherine M. Owens, MD,
Consultant Radiologist,
Great Ormond Street Hospital (GOSH)
London, United Kingdom

“Children really are the ultimate test of a good CT machine. They are small—many of the hearts operated on are about the size of a walnut—and the rapid heart rates and faster breathing in children cause motion artifacts; and older children may be uncooperative.”²⁴



High attention for the young

When examining children, safeguarding their developing organs and tissues from high radiation doses must be a priority. At the same time, the youngest ones are often unable to hold still. In the past, this only let you choose between motion-blurred images and sedation. The SOMATOM Force can reduce the need for sedation and help you scan children and young adults with utmost care—enabled by fast, powerful, and at the same time sensitive technology.

One example is Turbo Flash scanning at an industry-leading maximum scan speed of 737 mm/s, combined with 0.25 s rotation time. High power at 70 kV and 80 kV enables scanning at low kV values. In combination with the integrated CARE Child technology, you are perfectly prepared for lowest-dose pediatric scanning.

Excellent
visualization
of tumor and
vessels

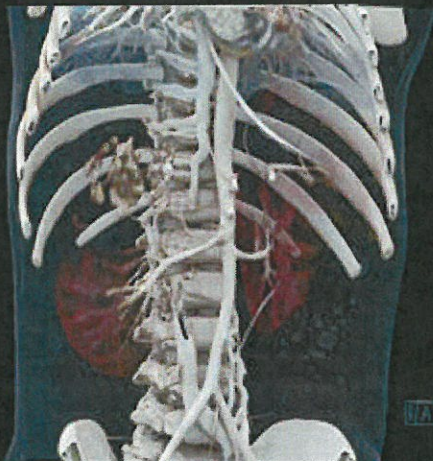
Staging of a Wilms tumor—
2-year-old child

Arterial

Collimation: 96 × 0.6 mm
Scan time: 2.03 s
Scan length: 246 mm
Rotation time: 0.28 s
Tube settings: 80 kV, 552 mAs
CTDI_{vol}: 8.13 mGy
DLP: 174.25 mGy cm

Venous

Collimation: 96 × 0.6 mm
Scan time: 2.24 s
Scan length: 361 mm
Rotation time: 0.5 s
80 kV, 129 mAs
CTDI_{vol}: 1.9 mGy
DLP: 59.17 mGy cm



70 kV

Pediatric cardiac CT at 70 kV

Scan time: 0.61 s
Scan length: 79 mm
Rotation time: 0.28 s
Tube settings: 70 kV, 115 mAs
CTDI_{vol}: 1.16 mGy
DLP: 9.13 mGy cm
Eff. dose: 0.96 mSv
HR: 130 bpm

Visualization of coronaries
in a 2-month-old free-breathing
baby.



Courtesy of University of Karolinska, Solna, Sweden

"3rd generation DSCT enables one to perform coronary CTA at 70–80 kV in obese patients without compromising CNR and thus reduces radiation dose."^{14,24}



High quality at every weight

Obesity is a growing problem with global relevance. Getting high-quality images from these patients while keeping dose as low as possible can be challenging. In addition to dealing with a substantial amount of X-ray attenuation, imaging obese patients often comes with co-morbidities like asthma, making even short breath-holds difficult.

The SOMATOM Force combines the high power reserves of the Vectron™ X-ray tubes every kV value (up to 2 x 1,300 mA at 70, 80 & 90 kV) and the Stellar^{Infinity} detectors that are able to detect X-rays at very low signal intensities. This unique imaging chain enables sharp high CNR images of obese patients at high speed and low dose.

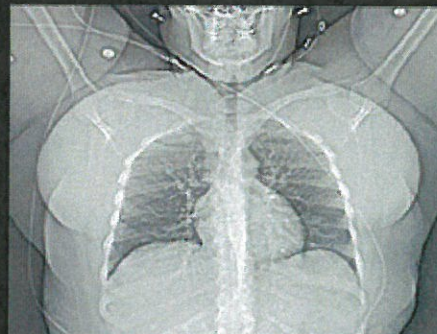
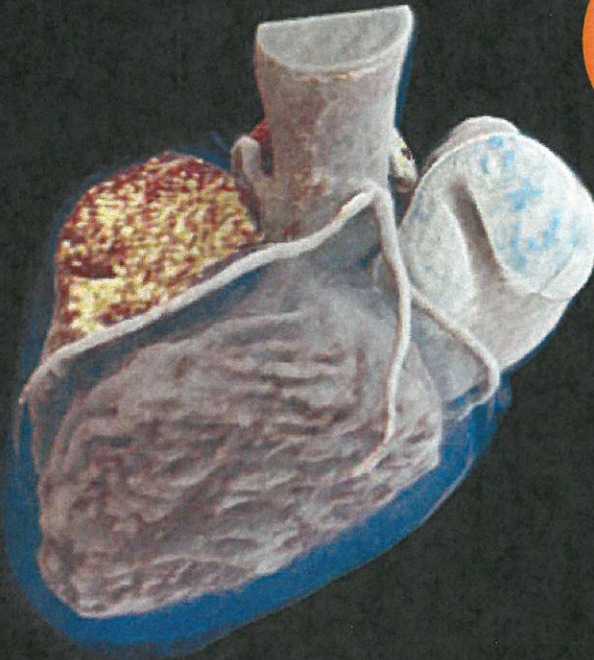
Additionally with the combination of CARE kV and 10 kV steps, the SOMATOM Force offers new levels of automated personalization. With its large bore of 78 cm and a patient load capacity of up to 307 kg (676 lbs), the SOMATOM Force helps you examine even the heaviest patients with ease.

Scan time
0.15 s

Cardiac imaging for obese patients—
Turbo Flash mode even for patients
with a BMI of 47

Collimation: $2 \times 192 \times 0.6$ mm
Scan time: 0.15 s
Scan length: 111 mm
Rotation time: 0.25 s
Tube settings: 100 kV, 600 mAs
CTDI_{vol}: 5.93 mGy
DLP: 91.5 mGy cm
Eff. dose: 1.28 mSv
HR: 56 bpm
BMI: 47

Vectron™ X-ray tubes enable
100 kV scans even in severely
obese (BMI 47) patients within
0.15 s and at excellent image quality.





High speed for saving lives

In emergency cases, every second counts. But patients often are unable to follow commands. In the past, this resulted in motion artifacts—which is especially unacceptable when images are urgently needed for life-saving procedures.

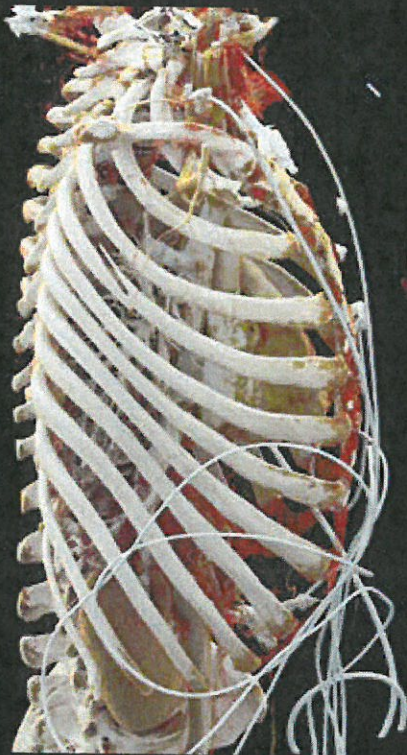
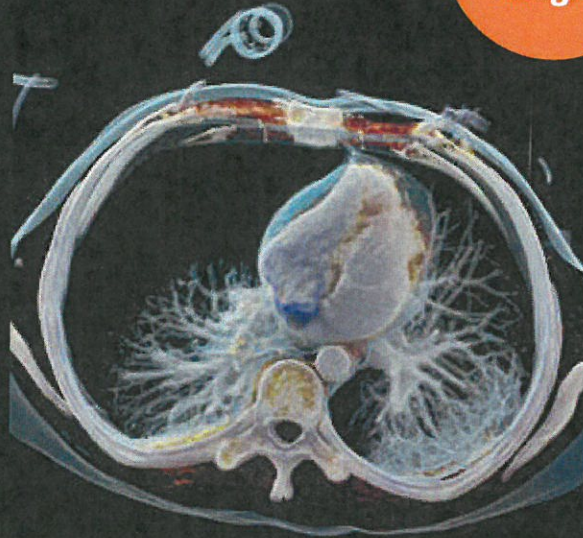
Instead of making demands on your patients, acquire data at speeds that allow you to freeze motion when your patient can't cooperate. The SOMATOM Force combines high power reserves that enable fast rotation at 0.25 s with fast Dual Energy acquisition in clinical routine, resulting in motion-artifact-free images even when people and organs move.

In conjunction with exceptionally fast reconstruction and post processing speeds, integrated workflow algorithms help you accelerate the emergency workflow: for example, by unfolding ribs and letting you accurately prepare spine recons with a single click.

Ultra-high
resolution
imaging

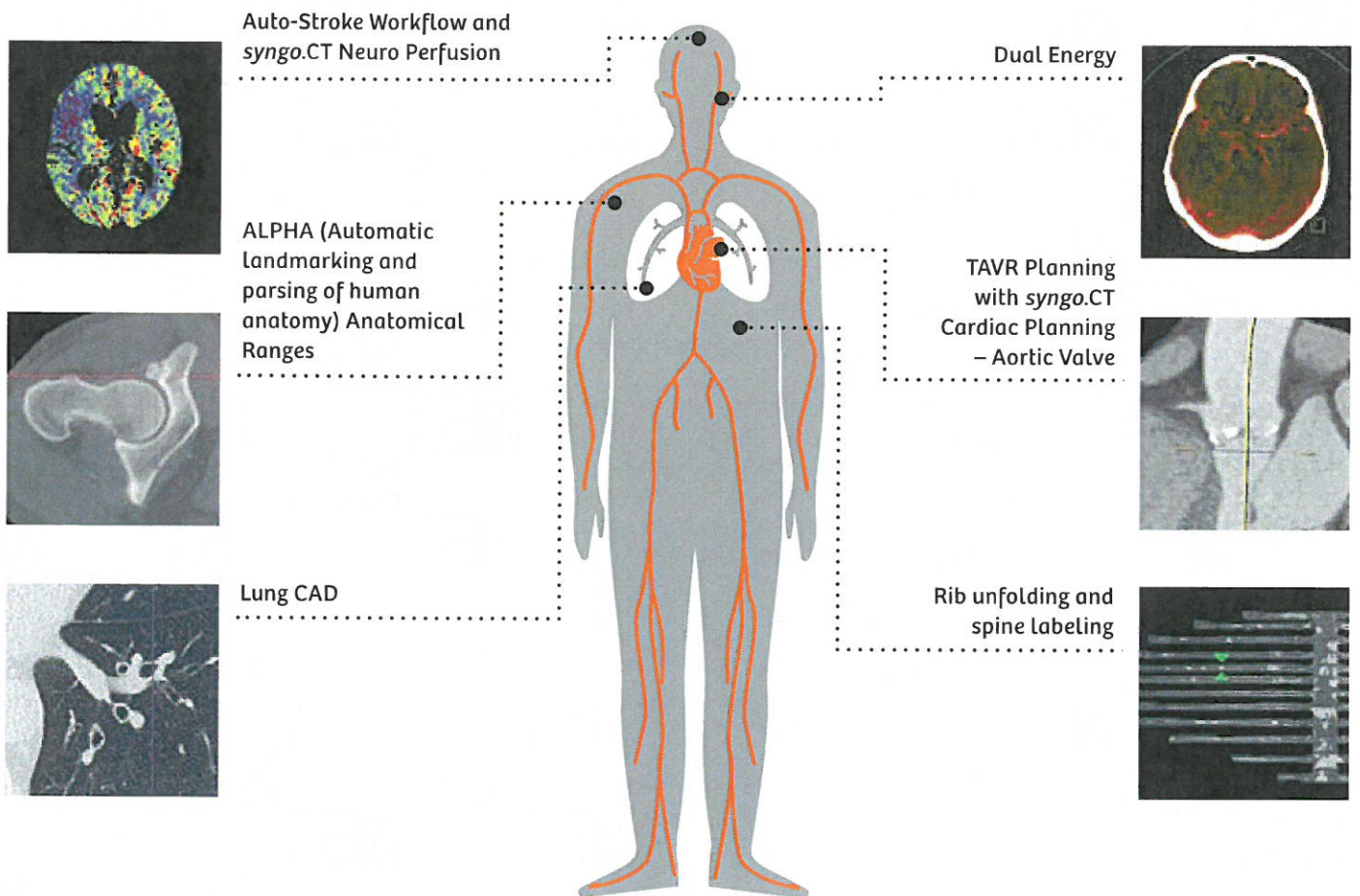
Dual Energy—thorax and spine trauma

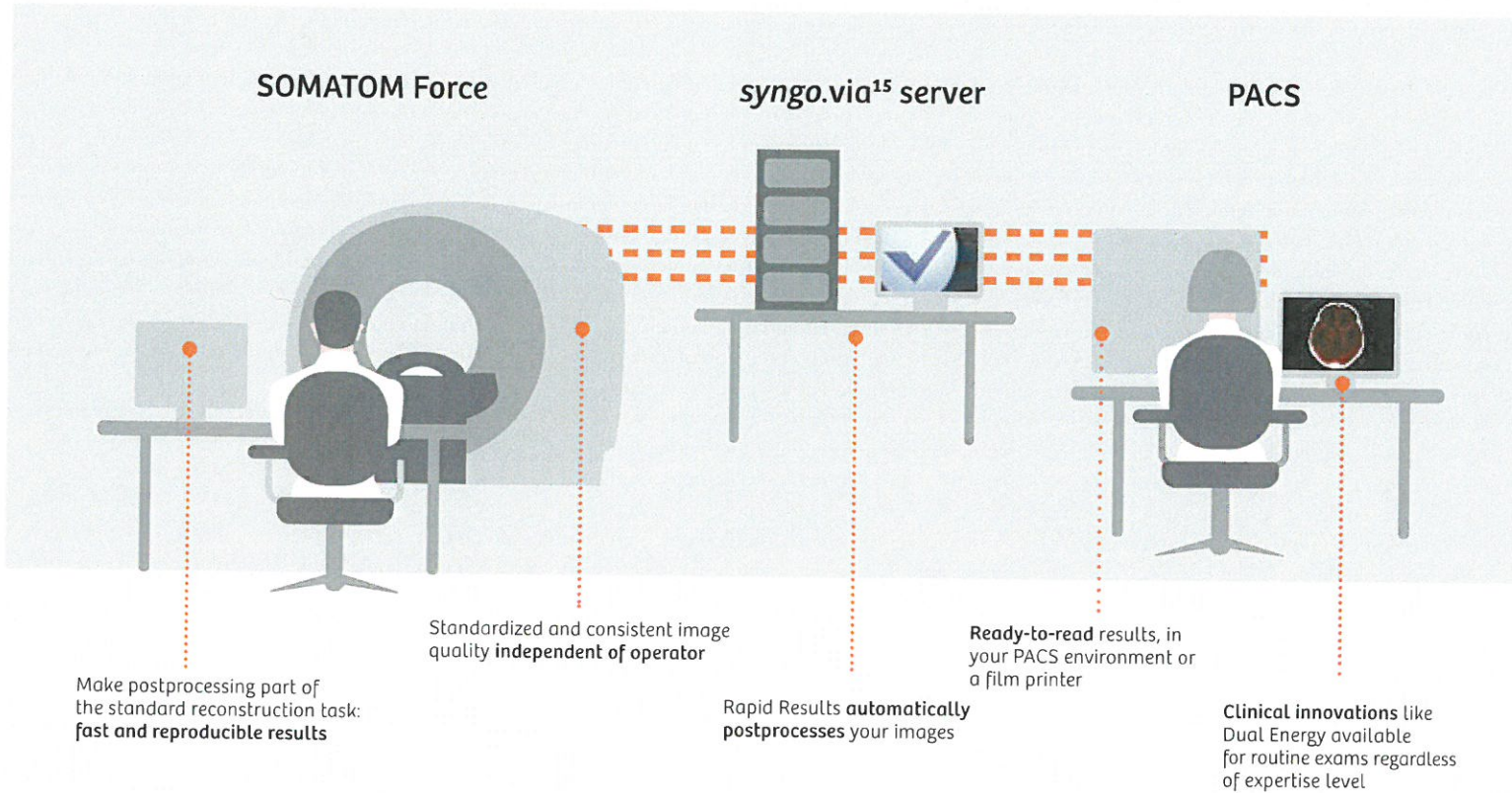
Collimation: $2 \times 128 \times 0.6$ mm
Pitch: 0.6
Scan time: 12.08 s
Scan length: 555 mm
Rotation time: 0.5 s
Tube settings: 100 kV/Sn 150 kV,
89/47 mAs
CTDI_{vol}: 5.28 mGy
DLP: 276.5 mGy cm
Eff. dose: 4.15 mSv



Courtesy of University of Tuebingen, Tuebingen, Germany

Rapid Results applications available with the SOMATOM Force and *syngo.via*





Rapid Results—zero-click postprocessing

Rapid Results enables direct communication between syngo.via and the SOMATOM Force, enabling zero-click postprocessing within the selected scan protocol. This is how syngo.via automatically creates and sends ready-to-read results from wherever you are to your PACS or a film printer. Rapid Results knows what you need, right when you need it. This is reading as simple as it should be. With Rapid Results, you can automatically generate neuro perfusion maps, standard visualizations of general vessels and different anatomies in various types and orientations, and visualizations of the rib cage in an easy-to-report format.

What’s more, you can get your Dual Energy scans PACS-ready with all your preferred reconstructions with no need for further interaction in syngo.via. Define your workflow once, and let Rapid Results produce the basis for your decisions.

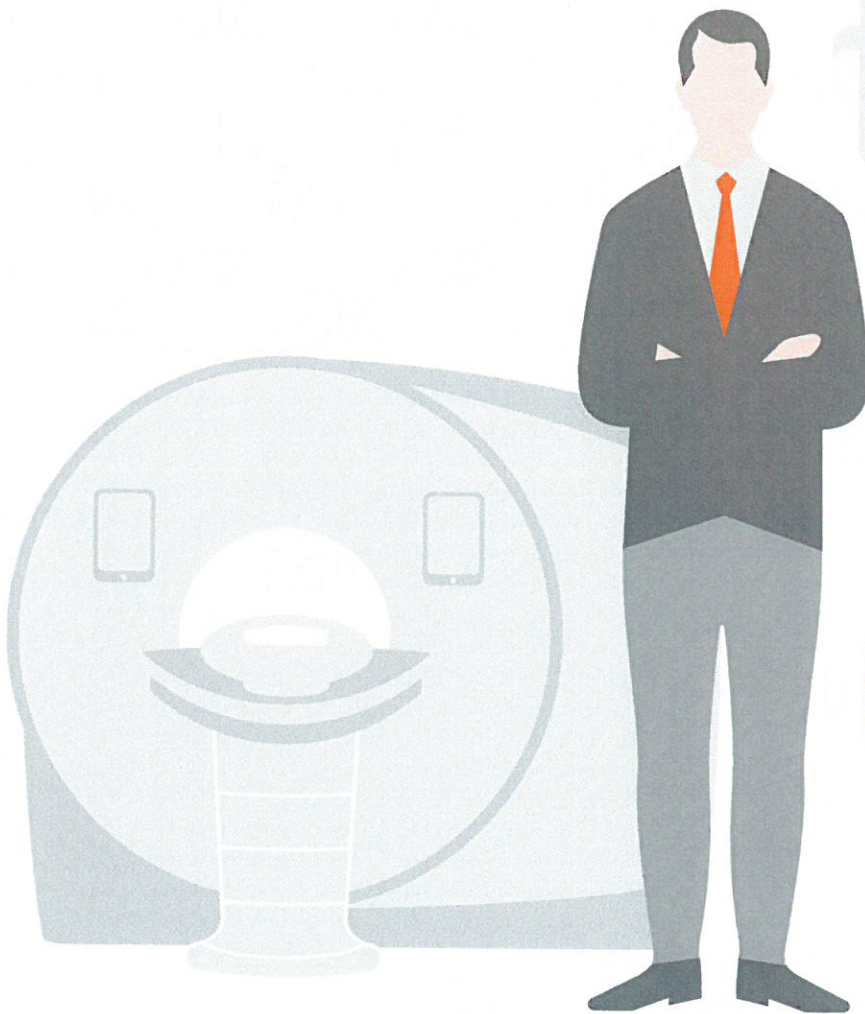
Your benefits with Rapid Results

- 1 Clinical innovations like CT Bone Reading and Dual Energy for routine exams regardless of expertise level
- 2 Standardized and consistent image quality
- 3 Postprocessing as part of the standard reconstruction task
- 4 Ready-to-read results wherever you want them

How can you shape the future of imaging?

Keeping your institution at the forefront of innovation usually involves more than just the ivory tower. How can you gain statistically reliable data, even from patient cohorts that are difficult to scan? How can you share knowledge in a professional research environment and build technological partnerships?

"Innovation is equally important to our success as operational effectiveness." ...



Get two steps ahead in expert leadership



Help shape the future of healthcare today by spearheading medical innovation for tomorrow. As a member of the global SOMATOM Force community of clinical experts, you have access to the latest research tools and the highest quality of CT imaging data enabling new insight into how medicine can be practiced.

Advance your research— with professional tools

As a SOMATOM Force user, you have access to the unique *syngo.via* Frontier research environment. You can develop your own algorithms and share them in an international network of experts, test prototypes in routine reading, and explore new trends.

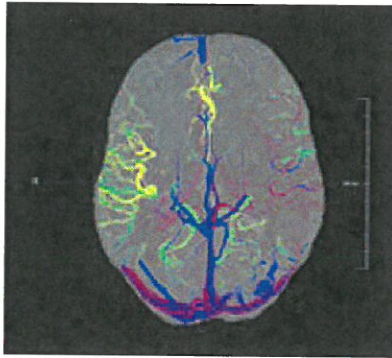


From ideas to prototypes

An ideal research environment gives you access to the latest applications, provides tools that translate your ideas into tangible prototypes, and supports your exchange with other experts around the world. With *syngo.via* Frontier,¹⁸ you can explore the potential of advanced postprocessing prototypes that are seamlessly integrated with your routine *syngo.via* system.

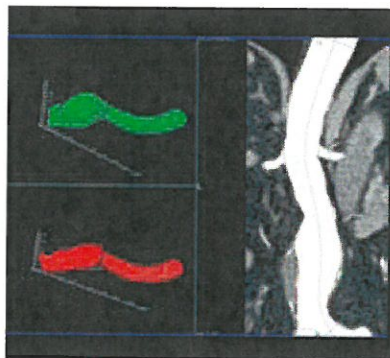
syngo.via Frontier also enables you to easily implement your own algorithms and connects you directly with other key opinion leaders and the Siemens Healthineers predevelopment teams. Save time and reduce costs with an integrated research solution. Boost your reputation and attract talents as well as patients. Bridge the gap in postprocessing translational research with *syngo.via* Frontier.

syngo.via Frontier Prototypes*



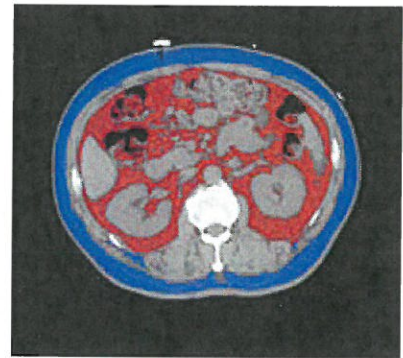
CT Flow Visualization

Whereas perfusion techniques evaluate the patient's brain parenchyma, the main goal of this prototype is to provide insight into the dynamics of the vascular structures.



CT 3D Printing for AAA

This prototype for 3D printing of an abdominal aortic aneurysm (AAA) is designed to someday help demonstrate the future use of this technology for decision-making and device selection for endovascular repair.



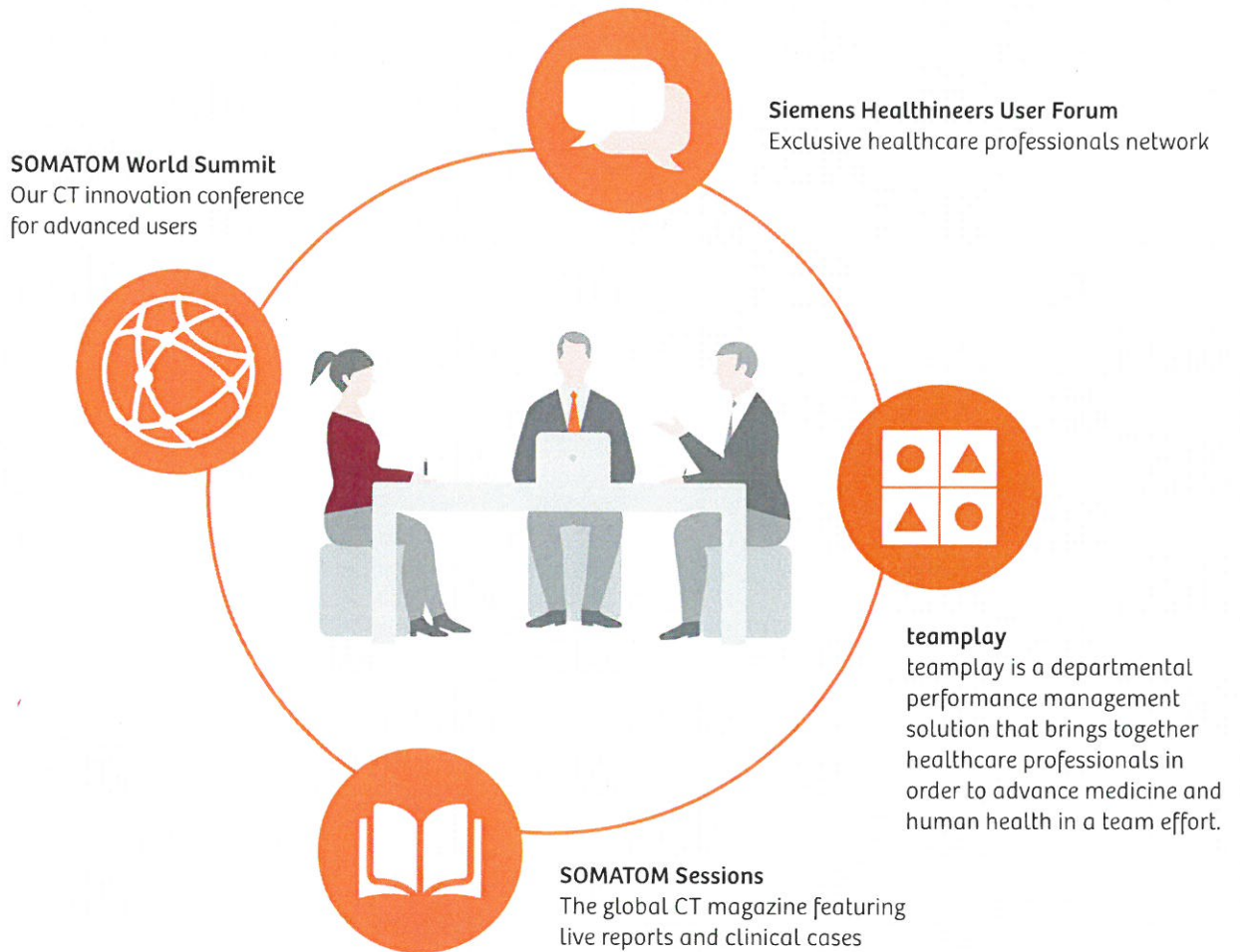
CT Cardiac Risk Assessment

This prototype uses non-contrast CT data to provide an analysis of visceral fat.

*Not intended for clinical use. For research use only.

Connect with peers and lead a global community

The SOMATOM Force is more than a CT scanner. It grants you access to a community of clinical experts that regularly shares knowledge and the latest medical developments peer-to-peer.



Connect with peers at the Siemens Healthineers' regular SOMATOM World Summit attended by almost 500 radiologists and executives from around the world. You can also get the most recent user stories from our SOMATOM Sessions online and printed magazine.



> 220 peer-reviewed publications

"... FORCE CT scanner and third generation iterative reconstruction enable large reductions in radiation ..."
"... pulmonary disease. ... effective dose of 0.14 mSv ..." "... equivalent to a standard posterior to anterior and lateral chest radiograph."
Newell, Hoffman, et al.

"... peak tube current of 1,300 mA ... at a tube voltage of 70 kV ... enables lowering radiation dose and contrast media volumes (45 mL vs. 80 mL)."
Meyer, Henzler, et al.

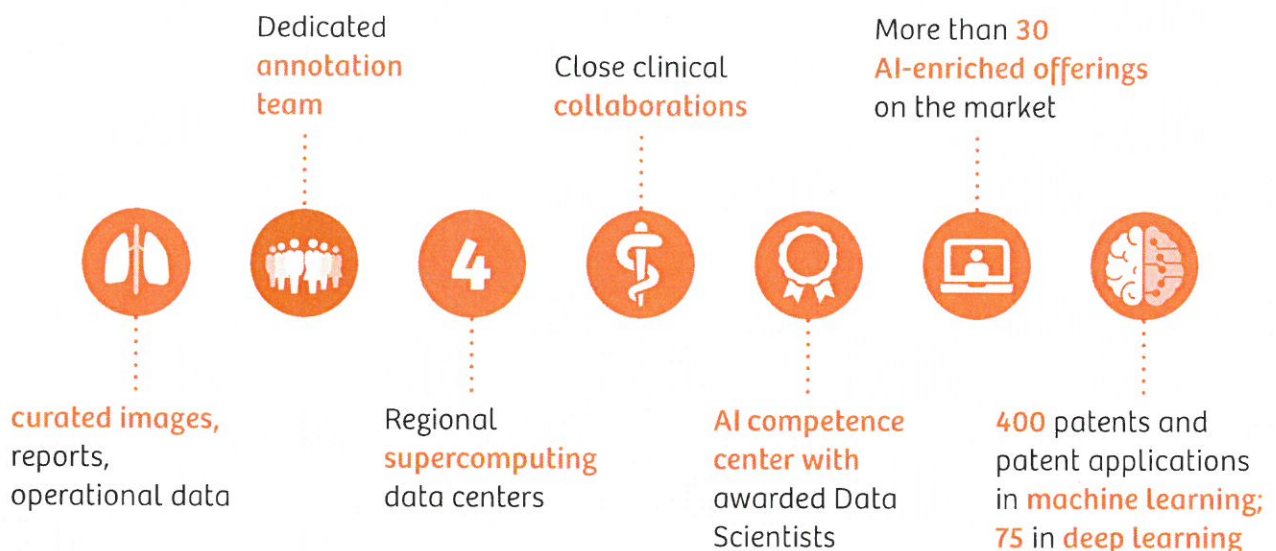
"The high-pitch data acquisition of the heart is fast, taking less than 0.2 s, and is associated with a low radiation dose of 0.4 mSv."
Gordic, Alkadhi, et al.

"... DE performance is best for 80/150 Sn kV—irrespective of the phantom size." "For all patient diameters, image noise in the VNC images is lowest at 80/150 Sn kV."
Krauss, Flohr, et al.

Artificial Intelligence

Siemens Healthineers is one of the market leaders in artificial intelligence and deep learning development. We believe artificial intelligence will have a significant role in helping you more efficiently and effectively care for your patients both today and tomorrow.

We have what it takes



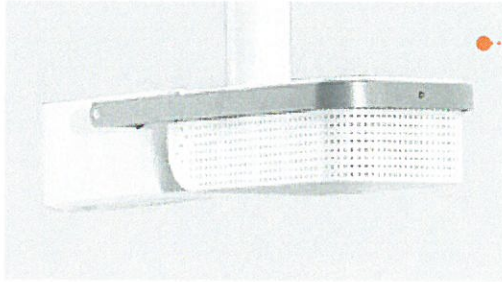
Definitions and terminology

Artificial Intelligence (AI): describes the status when a machine mimics “cognitive” functions that humans associate with other human minds.

Machine learning: enables the machine to adapt to new circumstances and to detect and extrapolate patterns.

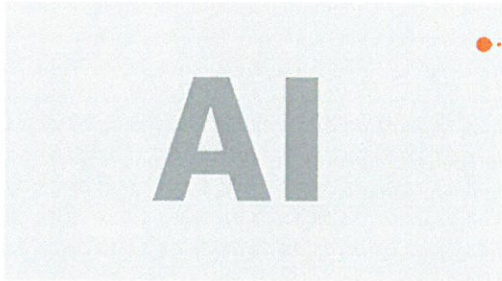
Deep (Machine) learning: is a type of machine learning that uses multi layer neural networks with multiple hidden layers between the input and output layers.

Deep learning algorithms help to care for patients more individually



Input

- Color Image Data
- 3D Depth Image Data
- Infrared Image Data
- FAST Integrated Workflow incl. unique FAST 3D Camera



Artificial Intelligence

Based on deep learning algorithms the following are possible:

- Landmark detection
- Range detection based on protocol input
- Range adaption to user changes over time
- Isocenter positioning
- Patient direction analysis



Output

- Right dose modulation with **FAST Isocentering**
- Right scan direction with **FAST Direction**
- Correct and complete body region with **FAST Range**

Expand your capabilities and reconsider traditional imaging pathways

With Dual Source imaging, CT has advanced far enough to take on new roles and help redefine traditional ways of examining patients. One of the most prominent examples is imaging in trauma.

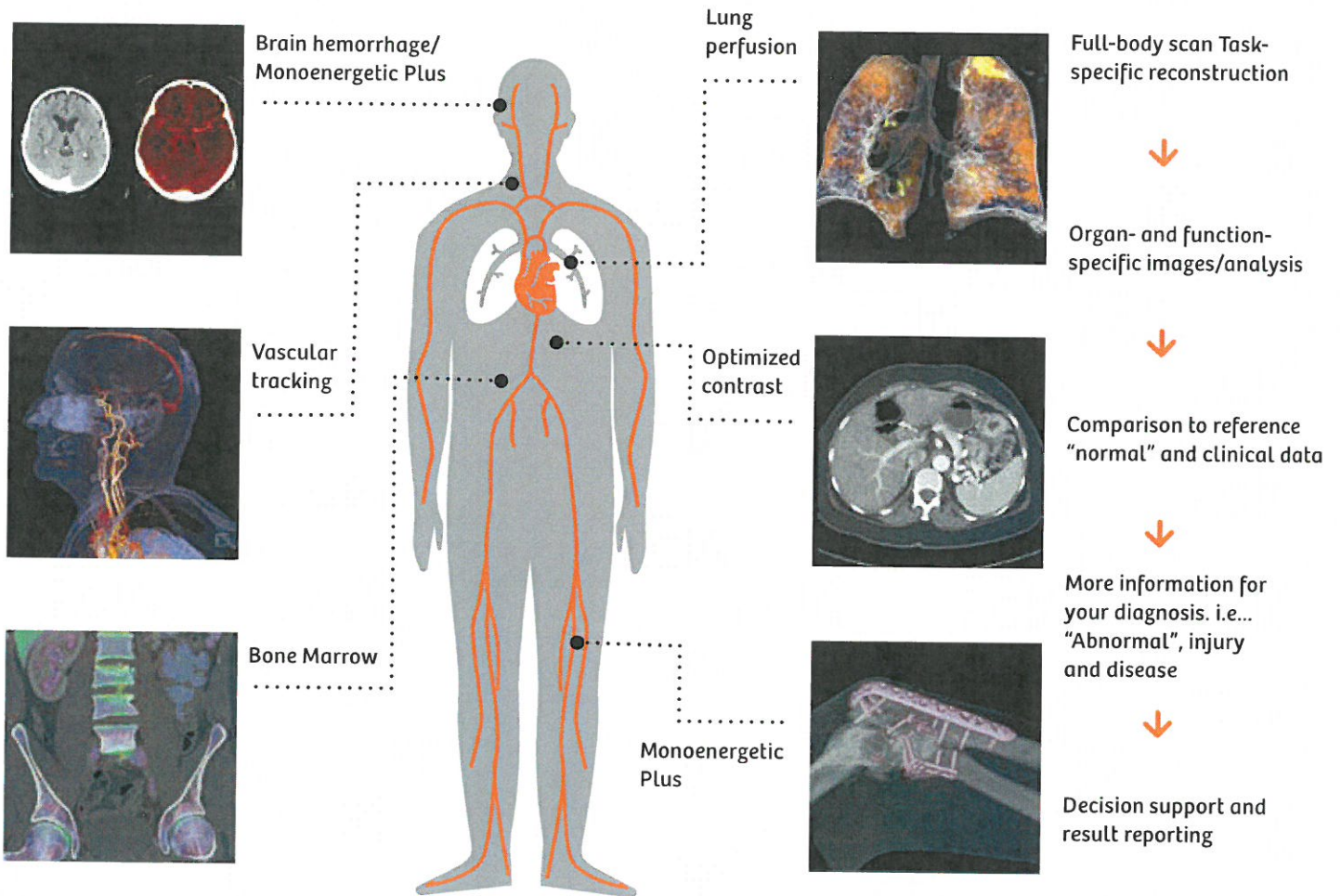


A unique combination for fast decision-making

To take complete advantage of additional information in trauma full-body scans, workflow changes and even higher speeds are necessary. The SOMATOM Force combines a unique range of Dual Energy technologies

like fast Dual Energy acquisition, Virtual Monoenergetic, virtual non-contrast (VNC), Iodine Maps, and Bone Marrow images that enable fast, high-quality decision-making for diverse patients and exams.

Exploration of the role of quantitative imaging in trauma



SOMATOM Force

Detectors:	2 × Stellar ^{Infinity} detectors with anti-scatter 3D collimator grid
X-ray tubes:	2 × Vectron™ X-ray tubes
Number of acquired slices:	384 (2 × 192) slices
Rotation time:	up to 0.25 s ¹⁹
Temporal resolution:	up to 66 ms ¹⁹
Generator power:	240 kW (2 × 120 kW)
kV settings:	70–150 kV in steps of 10 kV
Spatial resolution:	0.24 mm ¹⁹
Max. scan speed:	737 mm/s ¹⁹ with Turbo Flash
Table load:	up to 307 kg/676 lbs ¹⁹
Gantry opening:	78 cm
FAST IRS (image reconstruction system):	70 fps (FBP) 70 fps (IR)

Dual Source technology

- Precise and dose-neutral Dual Source Dual Energy
- Turbo Flash scanning (up to 737 mm/s)
- 66 ms native temporal resolution

Tin Filters

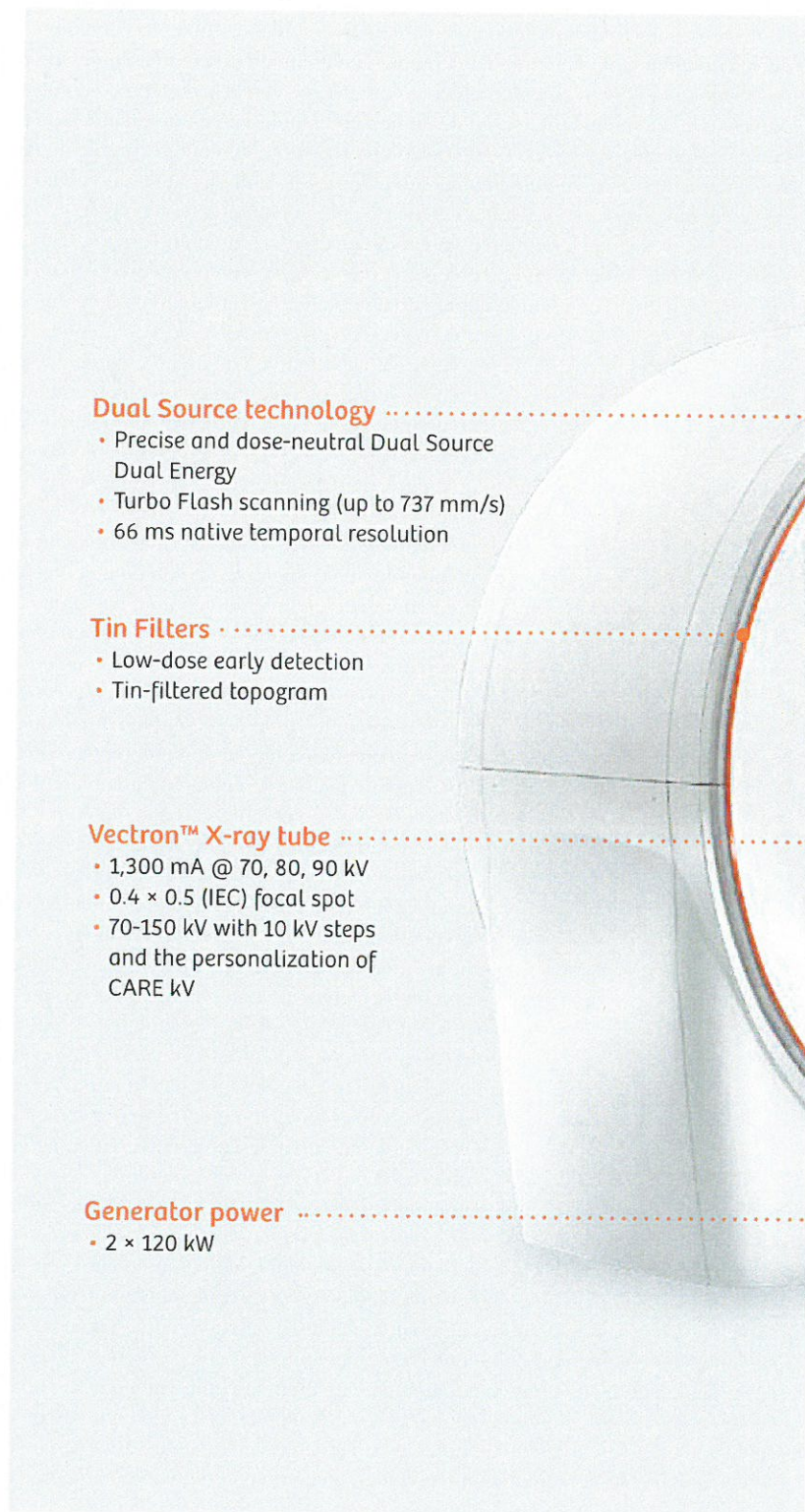
- Low-dose early detection
- Tin-filtered topogram

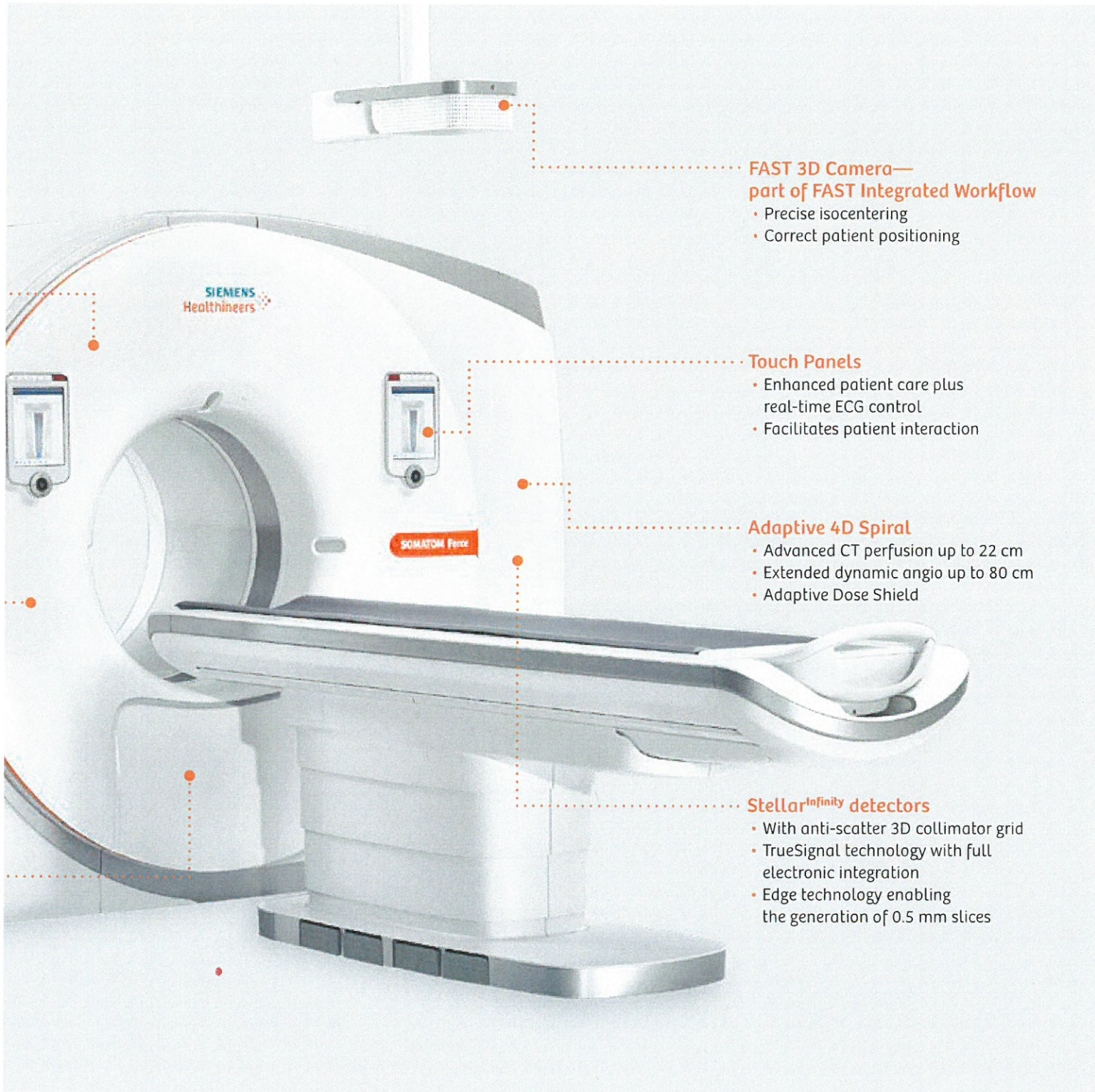
Vectron™ X-ray tube

- 1,300 mA @ 70, 80, 90 kV
- 0.4 × 0.5 (IEC) focal spot
- 70-150 kV with 10 kV steps and the personalization of CARE kV

Generator power

- 2 × 120 kW





**FAST 3D Camera—
part of FAST Integrated Workflow**

- Precise isocentering
- Correct patient positioning

Touch Panels

- Enhanced patient care plus real-time ECG control
- Facilitates patient interaction

Adaptive 4D Spiral

- Advanced CT perfusion up to 22 cm
- Extended dynamic angio up to 80 cm
- Adaptive Dose Shield

Stellar^{Infinity} detectors

- With anti-scatter 3D collimator grid
- TrueSignal technology with full electronic integration
- Edge technology enabling the generation of 0.5 mm slices

Additional products and services

syngo.via—reading as it should be: simple and cinematic

Reading should be simple. If you like to read and report with ease, you'll love the new *syngo.via*. All your favorite tools are centralized in one place, from basic distance measurement to CT vascular tools. This saves you clicks and mouse movement. With the new Findings Assistant, you can organize your findings and make sure you focus on what's relevant.

Reading should be cinematic. Make your communication with referrers and patients clear and convincing. With the new Cinematic VRT²³ in *syngo.via*, you can make your case look like something from an anatomy textbook. It only takes one click to create stunning, easy-to-understand clinical images. Use this photorealistic material for education, publication, and communication.

[siemens.com/syngo.via](https://www.siemens.com/syngo.via)

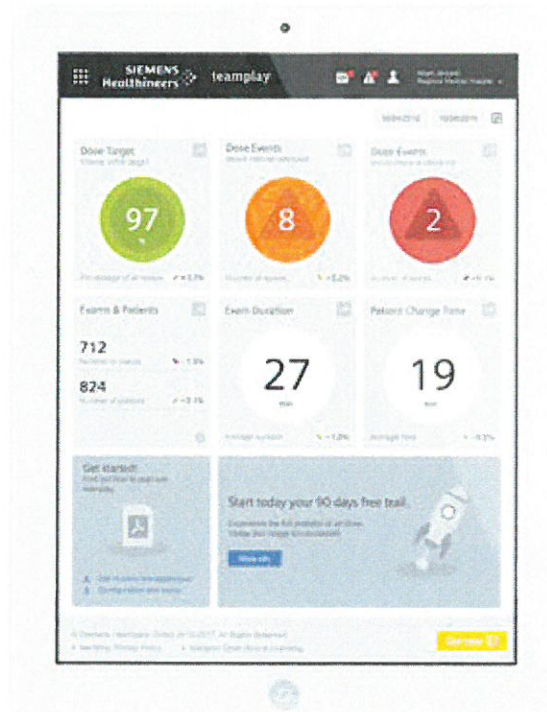
Cyber security—protecting data, systems, and patients

With ongoing digitalization in healthcare systems, the role of cyber security is ever increasing throughout the entire imaging chain. *syngo* System Security protects your imaging modalities and data from unauthorized access and manipulation. Custom-made activities range from fast and regular delivery of security fixes to incident support and vulnerability management. All of this is based on a comprehensive cyber security partnership that keeps you apprised of the latest developments in software and hardware as well as current innovations in the security field.

teamplay

*teamplay*²⁴ helps you to securely connect, compare, and collaborate. Connecting to the *teamplay* cloud gives you instant²⁴ access to your data for faster decision-making based on reliable, well-structured, and up-to-date key metrics. Comparing performance data to peer institutions^{25,26} helps you maintain competitive standards.

[siemens.com/teamplay](https://www.siemens.com/teamplay)



Guardian™ Program including TubeGuard

Predicting your tube's lifecycle:

- Continuous real-time monitoring
- Focus on the X-ray tube
- Failure prediction

[siemens.com/system-services](https://www.siemens.com/system-services)

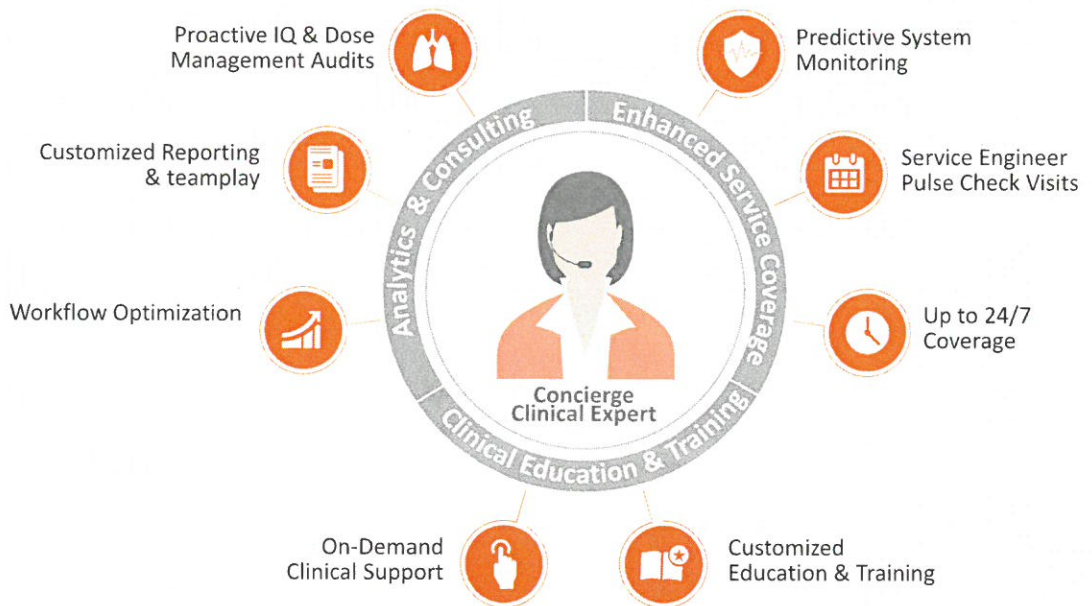
Customer Services—providing users with expertise and efficiency over the long term

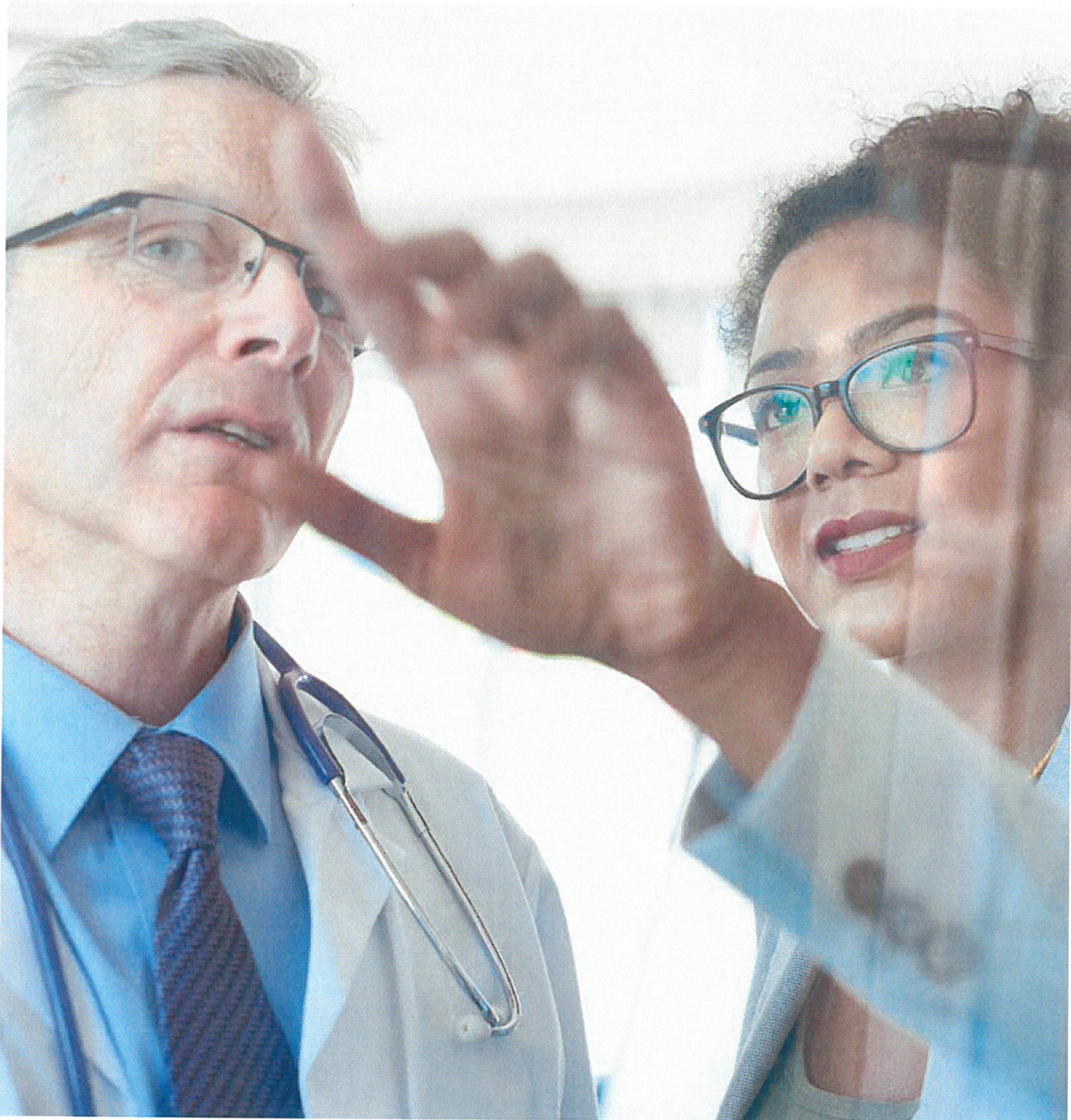
We're constantly focusing on high-quality services. Our extensive service portfolio for CT offers comprehensive service contracts including a variety of training modules. This makes Siemens Healthineers well positioned to address diverse customer needs in the healthcare market.

[siemens.com/user-services](https://www.siemens.com/user-services)

Signature Service—a personal concierge at your fingertips

Our Signature Service plan features a one-on-one consultative relationship with your own Concierge, a personal clinical expert who understands your specific needs and goals. Access a unique phone line where you can discuss all aspects of your service relationship—from education to system maintenance to workflow consulting.







Why Siemens Healthineers?

At Siemens Healthineers, our focus is to help healthcare providers succeed in today's dynamic environment.

Healthcare providers around the world have long relied upon our engineering excellence—leading-edge, high-quality medical technologies across a broad portfolio. Our technologies touch an estimated 5 million patients globally every day.²³ At the same time, they help hospital departments to continuously improve their clinical, operational, and financial outcomes.

We now consolidate this unprecedented volume of data and insights and turn them into pioneering enterprise and digital health services. With those, we maximize opportunities and share risks for the success of your entire health system.

Partnerships are built on people. With Siemens Healthineers there is no team more committed and more connected than we are to realize your success together.

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siemens.com/somatom-sessions
healthcare.siemens.com/news

Resources

- ¹ World Health Organization (WHO) Media Centre: Ageing and health. Available from: <http://www.who.int/mediacentre/factsheets/fs404/en/> [Accessed October, 2017].
- ² Deloitte. Vital Signs: How to deliver better healthcare across Europe. Available from: <https://www2.deloitte.com/content/dam/Deloitte/ch/Documents/life-sciences-health-care/ch-en-life-sciences-vital-signs.pdf#page=37> [Accessed October 9, 2017].
- ³ Dr. Yach D et. al., WHO/FAO. Tackle Diet-Disease Epidemic. Available from: <http://ceche.org/mol/Spring-03/11-1/PDFs/lead-1%2011-1.pdf> [Accessed October 9, 2017].
- ⁴ Thorpe KE. Chronic disease management and prevention in the US: The missing links in health care reform. Available from: <https://www.lse.ac.uk/LSEHealthAndSocialCare/pdf/eurohealth/VOL15No1/Thorpe.pdf> [Accessed 9th October 2017].
- ⁵ Compared with other state-of-the-art CT systems
- ⁶ Chronic Kidney Disease: CT or MRI? Morcos SK, Appl Radiol. 2008;37(5):19–24. McDonald et al., Intravenous contrast material-induced nephropathy. Radiology 2013.
- ⁷ Fractional Flow Reserve
- ⁸ Advanced Modeled Iterative Reconstruction
- ⁹ In clinical practice, the use of ADMIRE 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 ADMIRE 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 ADMIRE showed the same image quality compared to full dose data based on this test. Data on file.
- ¹⁰ Gordic S, Morsbach F, Schmidt B, Allmendinger T, et al. Ultralow-dose chest computed tomography for pulmonary nodule detection: first performance evaluation of single energy scanning with spectral shaping. Invest Radiol Jul. 2014. 49(7):465–473.
- ¹¹ Li J, Udayasankar UK, Toth TL, et al. Automatic patient centering for MDCT: effect on radiation dose. AJR 2007;188:547-552 and Kaasalainen T, Palmu K, Lampinen A, et al. Effect of vertical positioning on organ dose, image noise and contrast in pediatric chest CT-phantom study. Pediatr Radiol 2013;43:673–684
- ¹² Fully Assisting Scanner Technologies
- ¹³ Saltybaeva N, Alkadhi H; Vertical Off-Centering Affects Organ Dose in Chest CT: Evidence from Monte Carlo Simulations in Anthropomorphic Phantoms.
- ¹⁴ Meinel et al., Eur Radiol. 2014 Jul;24(7):1643-50 Image quality and radiation dose of low tube voltage 3rd generation dual-source coronary CT angiography in obese patients: a phantom study.
- ¹⁵ *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 right. *syngo.via* and the *syngo.via*-based software options are not commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.
- ¹⁶ pwc. Breakthrough innovation and growth. Top innovators expect US\$250 billion five-year revenue boost. Available from: <http://www.pwc.lu/en/advisory/docs/pwc-breakthrough-innovation-and-growth.pdf> [Accessed October 9, 2017].
- ¹⁷ Requires the license *syngo.via* Cinematic VRT. Cinematic VRT is recommended for communication, education, and publication purposes and is not intended for diagnostic reading.
- ¹⁸ For research use only. Not for clinical use.
- ¹⁹ Option
- ²⁰ Prerequisites include: wireless connection to clinical network, meeting recommended minimum hardware requirements, and adherence to local privacy and security regulations.
- ²¹ Information about this product is preliminary. It is under development, not commercially available, and its future availability cannot be guaranteed.
- ²² Availability of benchmarking option depends on a minimum number of considered subscribers to guarantee customer anonymity and data protection.
- ²³ Siemens AG., "Sustainable healthcare strategy Indicators in fiscal 2014": page 3–4.
- ²⁴ The statements by Siemens Healthineers' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

SOMATOM Force is not commercially available in all countries. Due to regulatory reasons, its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

On account of certain regional limitations of sales rights and service availability, we cannot guarantee that all products/services/features included in this brochure are available through the Siemens Healthineers sales organization worldwide. Availability and packaging may vary by country and are subject to change without prior notice.

The information in this document contains general descriptions of the technical options available and may not always apply in individual cases.

Siemens Healthineers reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens Healthineers sales representative for the most current information.

In the interest of complying with legal requirements concerning the environmental compatibility of our products (protection of natural resources and waste conservation), we may recycle certain components where legally permissible. For recycled components we use the same extensive quality assurance measures as for factory-new components.

Any technical data contained in this document may vary within defined tolerances. Original images always lose a certain amount of detail when reproduced.

The statements by Siemens Healthineers' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

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Malvern, PA 19355-9998, USA
Phone: 1-888-826-9702
usa.siemens.com/healthineers

Attachment H

EQUIPMENT COMPARISON – CMC ED CT Replacement and Relocation

	Existing Equipment	Replacement Equipment
Type of Equipment (List each component)	CT Scanner	CT Scanner
Manufacturer of Equipment	Siemens	Siemens
Tesla Rating for MRIs	N/A	N/A
Model Number	Definition AS 64-slice	SOMATOM Force 128-slice
Serial Number	66251	Not Available Until Installed
Provider's Method of Identifying Equipment	Internal Asset # / Serial #	Internal Asset # / Serial #
Specify if Mobile or Fixed	Fixed	Fixed
Mobile Trailer Serial Number/VIN #	N/A	N/A
Mobile Tractor Serial Number/VIN #	N/A	N/A
Date of Acquisition of Each Component	2012	2019
Does Provider Hold Title to Equipment or Have a Capital Lease?	Title	Title
Specify if Equipment Was/Is New or Used When Acquired	New	New
Total Capital Cost of Project (Including Construction, etc.)	\$691,763	\$6,062,606
Total Cost of Equipment	\$691,763	\$2,133,077
Fair Market Value of Equipment	\$691,763	\$2,133,077
Net Purchase Price of Equipment	\$691,763	\$2,133,077
Locations Where Operated	MMP CT Room A	CMC ED
Number Days in Use/To Be Used in N.C. per Year	250 days/year	365 days/year
Percent of Change in Patient Charges (by procedure)	0%	0%
Percent of Change in Per Procedure Operating Expenses (by procedure)	0%	0%
Type of Procedures Currently Performed on Existing Equipment	All Primary CT Applications	All Primary CT Applications
Type of Procedures New Equipment is Capable of Performing	All Primary CT Applications	All Primary CT Applications

Attachment I

**CMC MMP Imaging Center
Siemens AS-64 Volumes (CT Room A)**

Month	Volume
Nov-17	625
Dec-17	607
Jan-18	658
Feb-18	600
Mar-18	661
Apr-18	646
May-18	679
Jun-18	640
Jul-18	649
Aug-18	660
Sep-18	579
Oct-18	708
Total	7,712

Attachment J

SELECTPLUS™

Fair Market Value Analysis

WO: 799012

For: Chris Hollar

Facility: Carolinas Healthcare System

Date: Thursday, January 18, 2018

▶ Total ECRI FMV Estimate = \$858,255 to \$938,589

Vendor: Siemens Healthcare
Device: Scanning Systems, Computed Tomography
Model: SOMATOM Definition AS 64

Contents

- ▶ FMV Details
- ▶ Depreciation Table(s)

Thank you for your request for a fair market value (FMV) analysis of your two SOMATOM Definition AS 64 CT Systems from Siemens Healthcare. If you have any questions or require additional information, please do not hesitate to call the analyst.

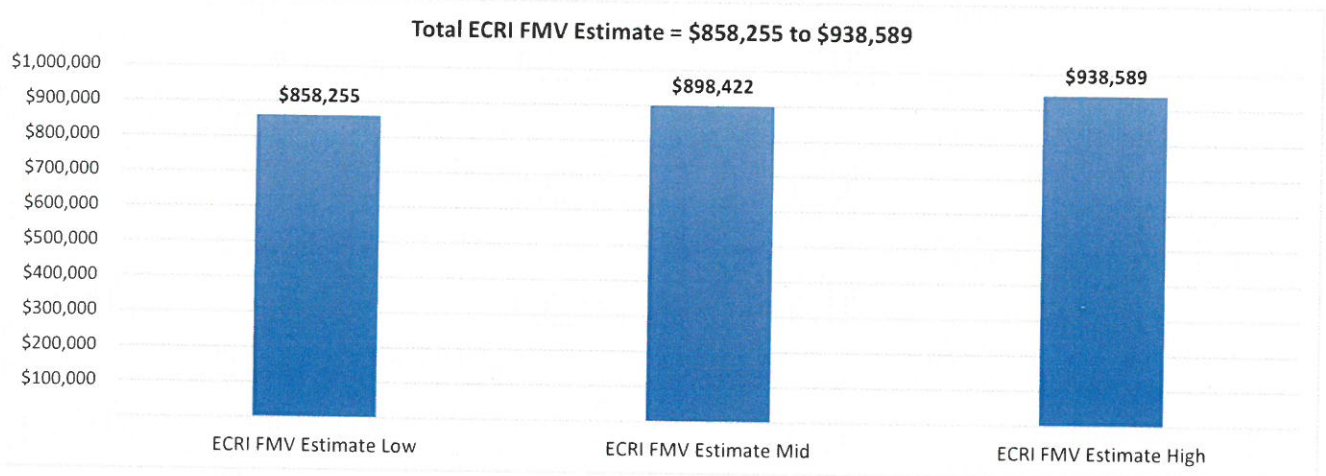
Prepared By

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ECRIInstitute
The Discipline of Science. The Integrity of Independence.

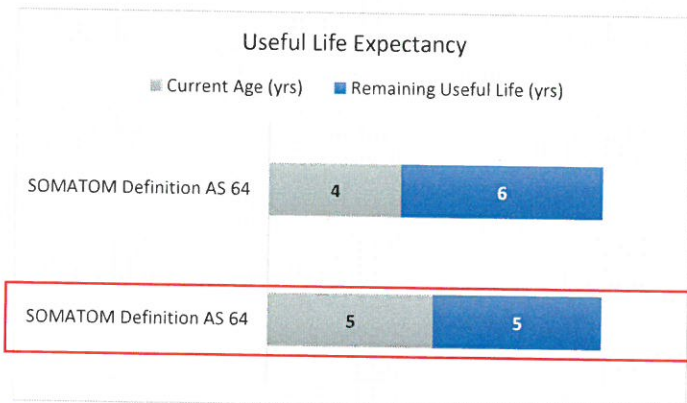
Disclaimer: ECRI Institute's FMV estimate is defined as the cash amount that a buyer may reasonably offer, and a seller accept, in exchange for capital medical equipment on the open market. Our estimate assumes that both the buyer and seller are reasonably knowledgeable and neither is being pressured into a transaction. ECRI Institute's FMV estimate is not an imposed value. Due to the highly subjective nature of FMV's, our estimate is not in any manner a guarantee of value.

FMV Analysis Details



Manufacturer	Model	Current Age (yrs)	ECRI Useful Life (yrs)	Remaining Useful Life (yrs)	Purchase Price	Price Source	Qty	ECRI FMV Estimate Low	ECRI FMV Estimate Mid	ECRI FMV Estimate High
Siemens Healthcare	SOMATOM Definition AS 64	4	10	6	\$788,722	ECRI	1	\$457,459	\$477,177	\$496,895
Siemens Healthcare	SOMATOM Definition AS 64	5	10	5	\$817,952	ECRI	1	\$400,796	\$421,245	\$441,694
TOTALS					\$1,606,674		2	\$858,255	\$898,422	\$938,589

Total ECRI FMV Estimate = \$858,255 to \$938,589



The ECRI useful life is the number of years we believe the product can typically be used and serviced. These expected useful lives are derived from a consensus of ECRI Institute experts that have examined the real-world replacement intervals for capital equipment and information technology.

We utilize a useful life expectancy of ten (10) years for CT Systems such as this. By way of comparison, the American Hospital Association (AHA) life span for this technology is five (5) years.

Discussion

ECRI Institute's FMV estimates are calculated using straight line depreciation (please see next tab for depreciation table). Your facility did not provide the original purchase prices. Therefore, we have utilized our PricePaid database to determine the average quoted prices at the original time of purchase. Based upon our assumptions, the estimated FMV of the equipment at four years reflects between 58% and 63% of the original estimated purchase price of \$788,722.21, and the estimated FMV of the equipment at five years reflects between 49% and 54% of the original estimated purchase price of \$817,951.60. Therefore, our total FMV estimate for both Siemens SOMATOM Definition AS 64 CT Systems is **\$858,255 to \$938,589**.

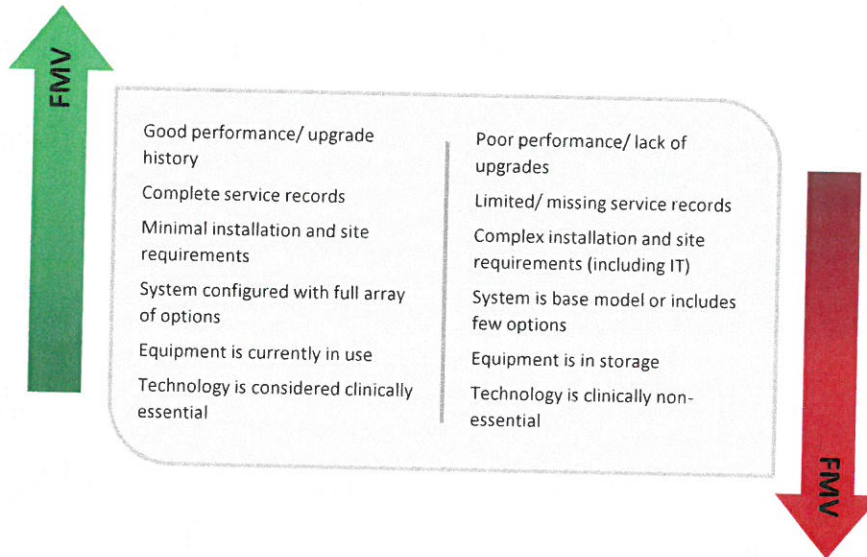
Please note that our FMV estimates do not take into account usage or condition of the equipment. Our analysis also does not account for any clinical value that the equipment may hold, but rather estimates what value the equipment may have in the used medical device marketplace. In order to most accurately determine the FMV of your equipment, we suggest that you:

1. Consider the availability of new technology.
2. Determine if the equipment no longer meets government or safety standards.
3. Decide if it is more economical to repair or replace the equipment.
4. Ensure the availability of repair parts from original equipment manufacturer (OEM).
5. Ascertain if obsolescence impacts clinical/operational effectiveness.
6. Define the reliability/dependability of the equipment.

Model-specific factors affecting the FMV:

Enhances FMV		Detracts From FMV	
Large market share	<input type="checkbox"/>	Small market share	<input type="checkbox"/>
Model still in production	<input type="checkbox"/>	Discontinued model	<input type="checkbox"/>
Well known OEM	<input type="checkbox"/>	Little known OEM	<input type="checkbox"/>
Service available from OEM	<input type="checkbox"/>	No longer serviceable by OEM	<input type="checkbox"/>
Service available from 3rd party	<input type="checkbox"/>	Servicing restricted to OEM	<input type="checkbox"/>
Stable technology	<input type="checkbox"/>	Volatile Technology	<input type="checkbox"/>

Other facility-specific factors that can impact the FMV:



Straight Line Depreciation Table(s)

10 Year Useful Life

FMV	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Max	90%	81%	72%	63%	54%	45%	36%	27%	18%	10%
Min	85%	76%	67%	58%	49%	40%	31%	22%	13%	5%

The member agrees to hold in strict confidence SELECTplus Custom Analyses, as well as the content of the other Products and Services offered under the SELECTplus Agreement, using them only for their intended purpose and within its own institution, and shall not transmit them to or share them with third parties without the prior written permission of ECRI Institute in each instance. The provisions of this clause shall survive expiration or termination of this Agreement. In the event that member uses or attempts to use the Custom Analysis, or other SELECTplus Products and Services, in a manner that is contrary to the terms of the SELECTplus Agreement, it may result in an automatic termination of the usage rights granted herein and will give ECRI Institute the right (in addition to any such remedies available to it) to injunctive relief enjoining those acts, it being acknowledged that legal remedies are inadequate.

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