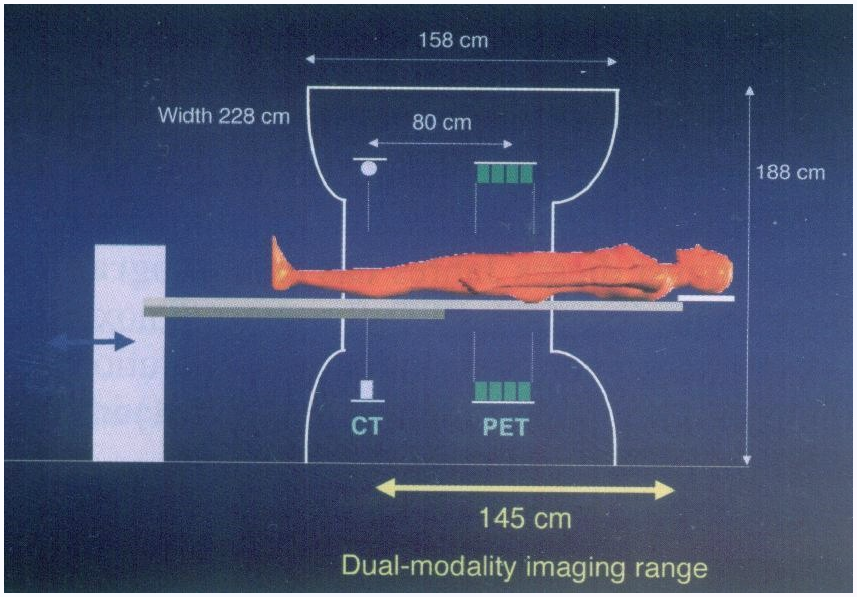
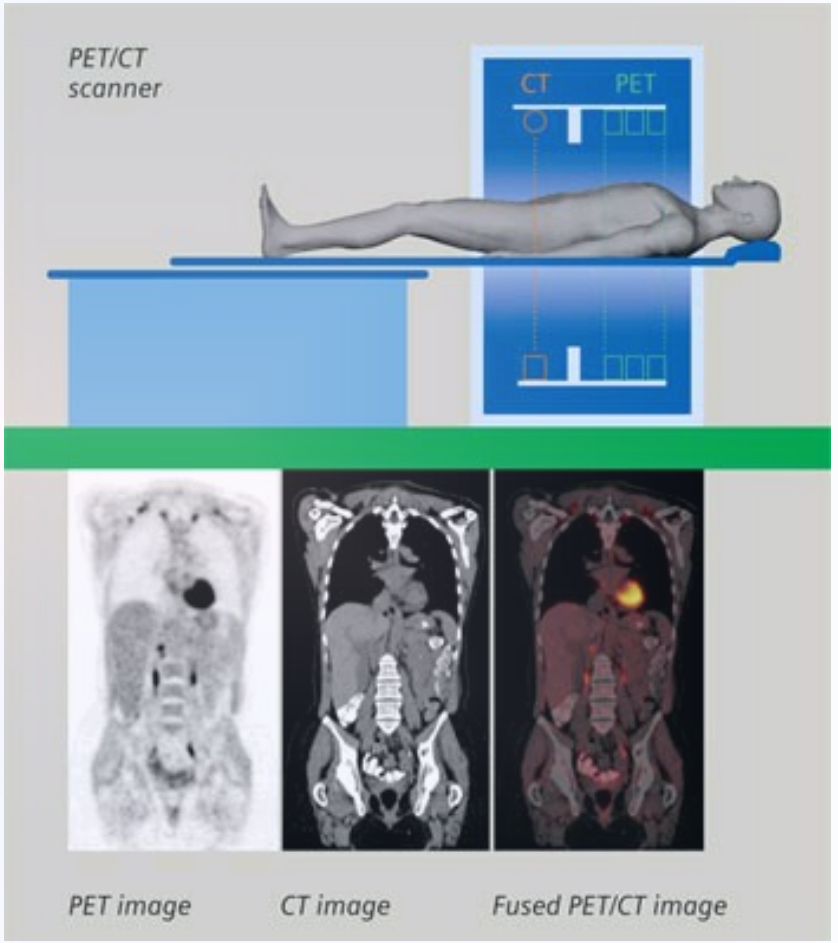
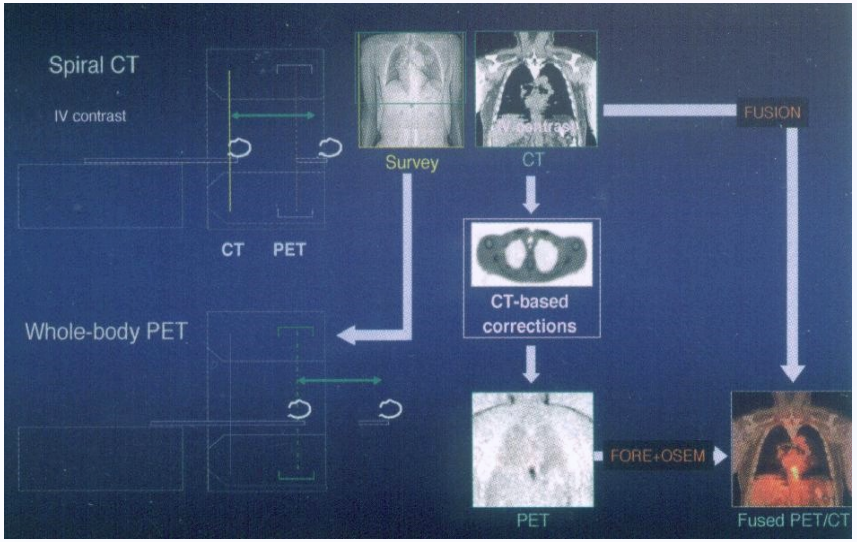
FÚZIÓ

- **térbeli illesztés - képregisztráció:**
- **különböző modalitású képek térbeli illesztése - koregisztráció**
- **azonos pozíciójú képek együttes kijelzése - fúzió**

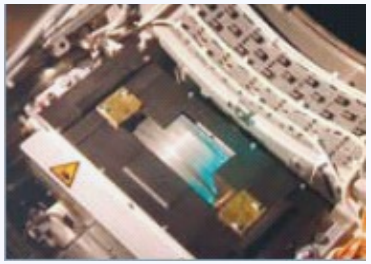
PET•CT

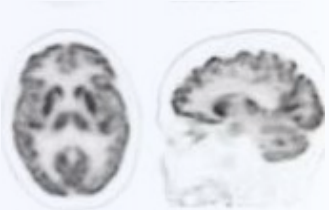

158 cm
Width 228 cm
80 cm
188 cm
CT
PET
145 cm
Dual-modality imaging range

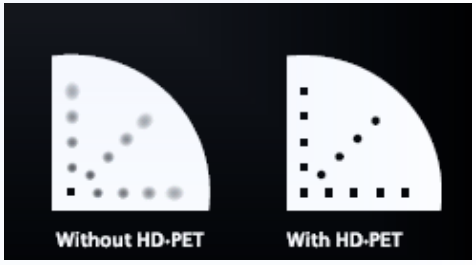

PET/CT
scanner
CT
PET
PET image
CT image
Fused PET/CT image


Spiral CT
IV contrast
CT
PET
Survey
CT
FUSION
CT-based
corrections
Whole-body PET
FORE+OSEM
PET
Fused PET/CT

BIOGRAPH mCT

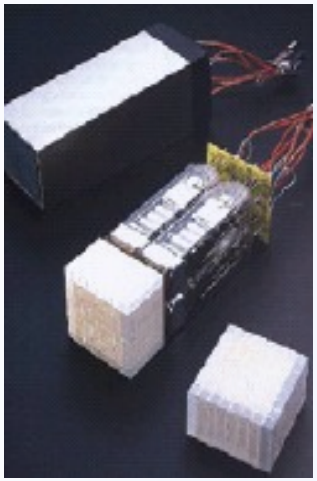


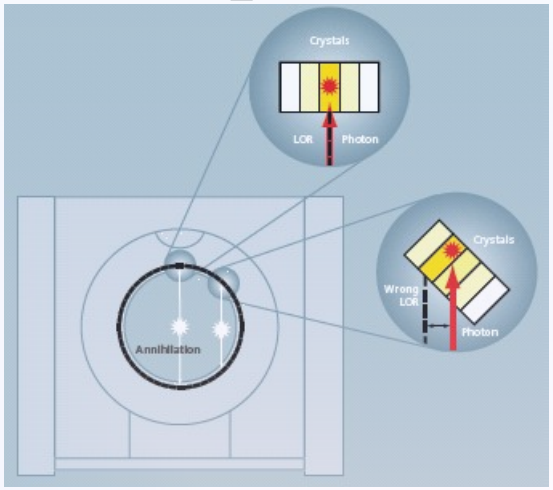


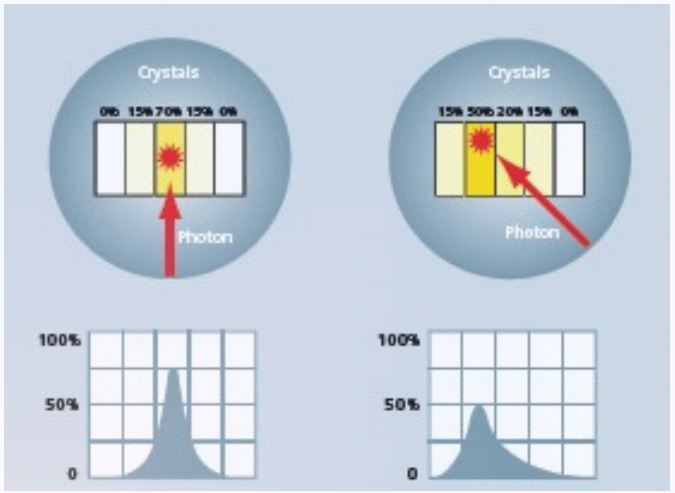


BIOGRAPH képmegjelenítés paraméterek

LOR Line Of Response



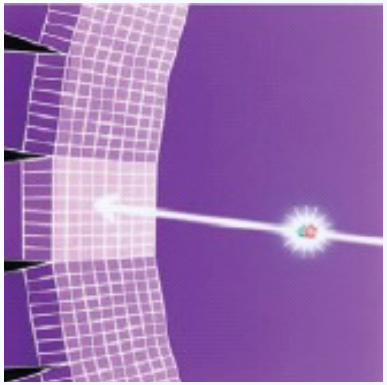


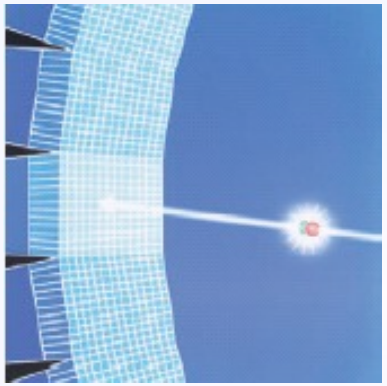


PET Detector Material Properties						
Property	Characteristic	Desired Value	LSO	BGO	GSO	NaI
Density (g/cc)	Defines detection efficiency of detector	High	7.4	7.1	6.7	3.7
Effective Atomic Number	Scanner sensitivity	High	65	75	59	51
Decay Time (nsec)	Defines detector dead time and randoms rejection	Low	40	300	60	230
Relative Light Output (%)	Impacts spatial and energy resolution	High	75	15	35	100
Energy Resolution (%)	Influences scatter rejection	Low	10.0	10.1	9.5	7.8
Nonhygroscopic	Simplifies manufacturing, improves reliability and reduces service costs	Yes	Yes	Yes	Yes	No
Ruggedness		Yes	Yes	Yes	No	No

BIOGRAPH képmegjelenítés paraméterek

Konvencionális és LSO HR (High Resolution) detektor



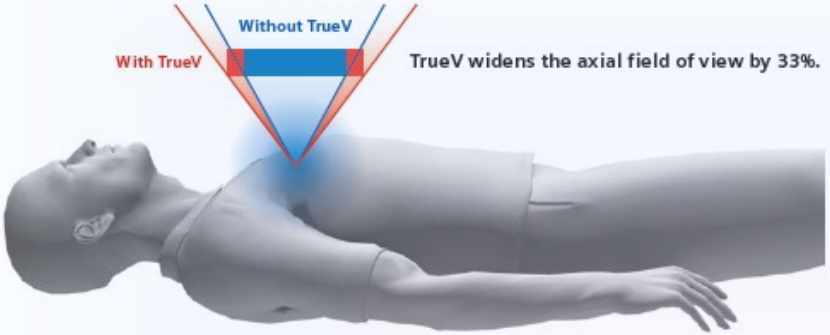


	Conventional PET	LSO HI-REZ PET
Crystal Material	BGO	LSO
Relative Light Output	<20%	>70%
Crystal Size	6.45 mm x 6.45 mm	4.0 mm x 4.0 mm
Total Number of Crystals	<11,000	24,336 (32,448)*
Number of Detector Rings	24	39 (52)*
Number of Contiguous Image Planes	47	81 (109)*
Slice Spacing	3.375 mm	2.0 mm
Transaxial Resolution	~6 mm	4.2 mm
Volumetric Resolution	>200 mm3	<75 mm3

Feature	Biograph	Biograph with TrueV
Axial bed coverage	162 mm	216 mm
Sensitivity	4.4	7.9
NECR	96 kcps	165 kcps
Resolution	4.2 mm	4.2 mm
Total number of detector elements	24,336	32,448
Total number of detector rings	39	52

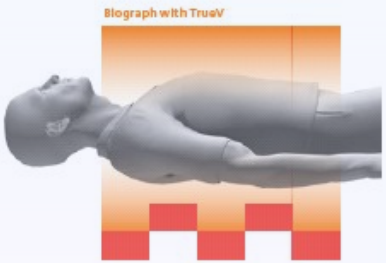
TruePoint PET•CT Technology www.siemens.com/ml

BIOGRAPH képmegjelenítés paraméterek, eredményképek

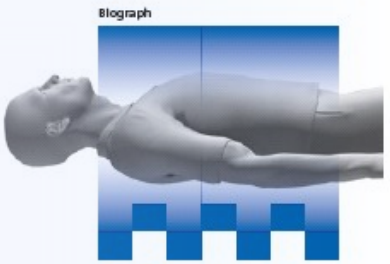


TrueV widens the axial field of view by 33%.

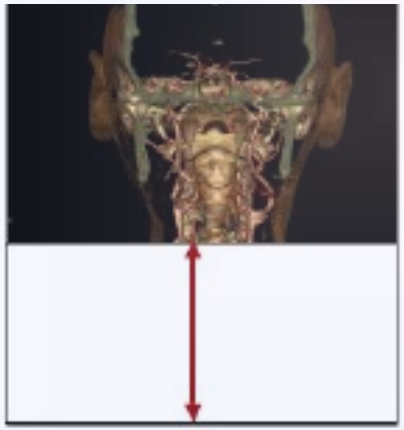
TrueV enables the fastest whole-body scans possible.



5 bed positions
2 minutes per bed
10 minutes total time



7 bed positions
3 minutes per bed
21 minutes total time



49 mm/sec

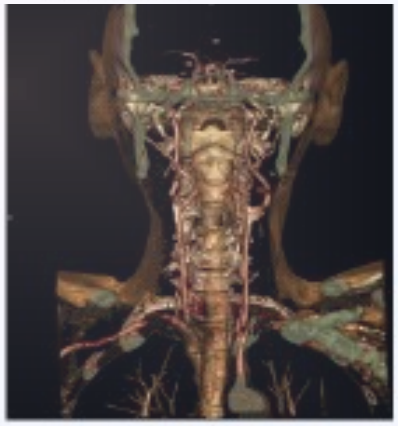
Biograph 40
TruePoint PET•CT
demonstrating SureView

40 x 0.6 mm, 0.37 sec
pitch 1.5 for
z-resolution of 0.4 mm

55 mm/sec

Competitive 64-slice
without SureView

64 x 0.625 mm, 0.4 sec limited to
pitch 0.55 for z-resolution of 0.4
mm



87 mm/sec

Biograph 64
TruePoint PET•CT
demonstrating SureView

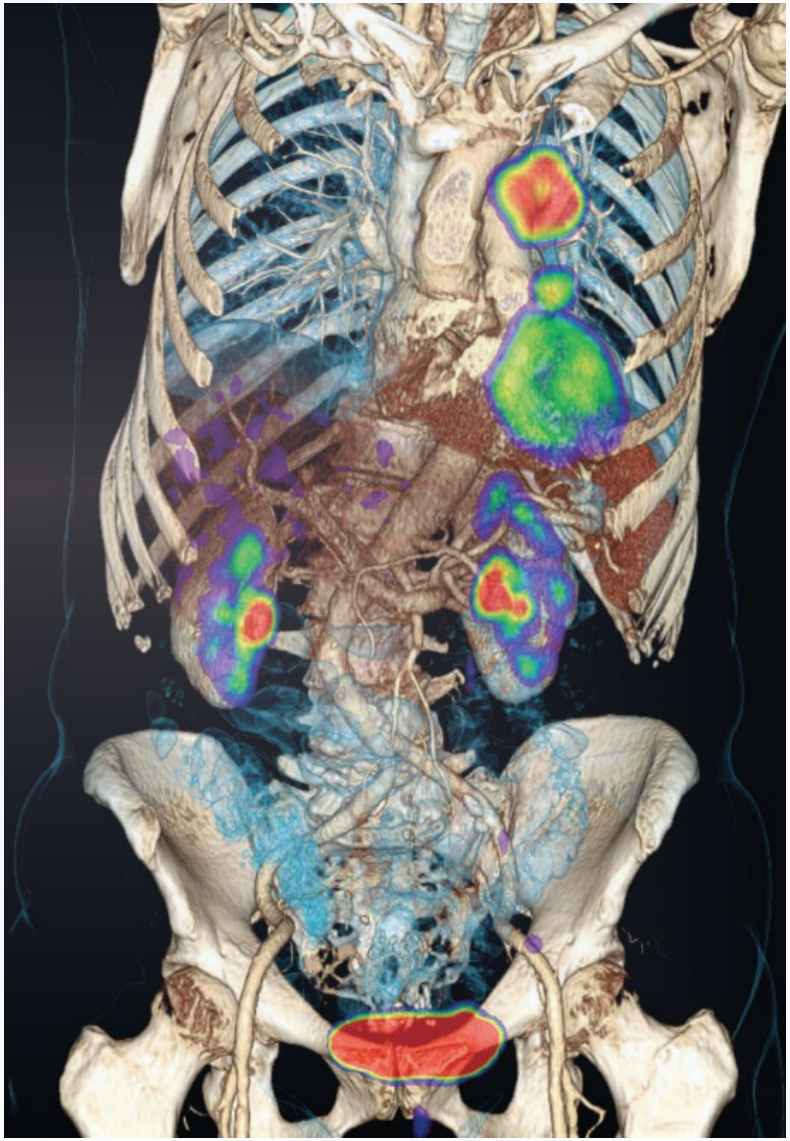
64 x 0.6 mm, 0.33 sec
pitch 1.5 for
z-resolution of 0.4 mm

TruePoint PET•CT Technology www.siemens.com/ml

Biograph™ TruePoint™ PET•CT

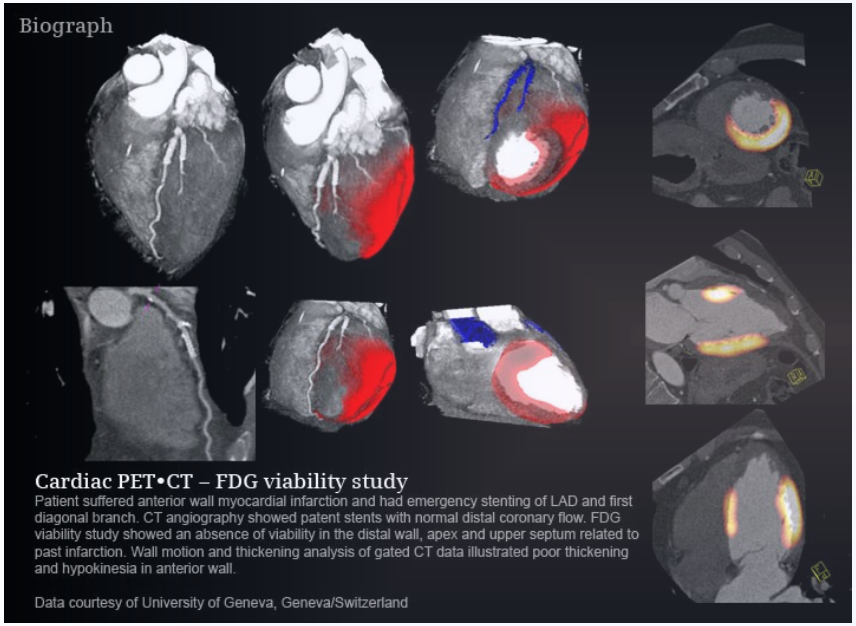
Technical Specifications

- 6-, 16-, 40- or 64- slice CT,
- 4x4 mm LSO crystal elements,
- 32,440 LSO crystals with TrueV,
- 21.6 cm axial PET field of view with TrueV,
- 165 kcps peak NECR with TrueV
- 190 cm patient scan range,
- 2x signal-to-noise improvement and uniform resolution with HD•PET,
- 10 minute whole-body PET•CT imaging with TrueV
- 0.24 mm isotropic CT resolution with z-UHR,
- 0.33 second rotation time on 64-slice CT.



http://www.medical.siemens.com

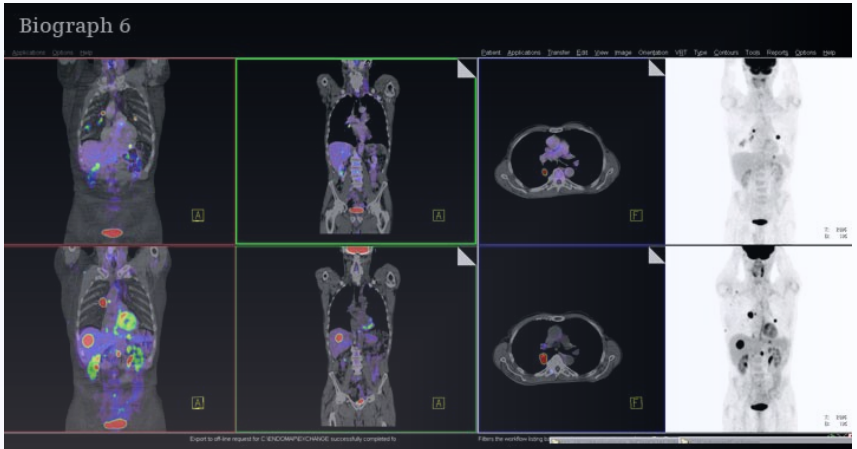
PET•CT



Cardiac PET•CT – FDG viability study

Patient suffered anterior wall myocardial infarction and had emergency stenting of LAD and first diagonal branch. CT angiography showed patent stents with normal distal coronary flow. FDG viability study showed an absence of viability in the distal wall, apex and upper septum related to past infarction. Wall motion and thickening analysis of gated CT data illustrated poor thickening and hypokinesia in anterior wall.

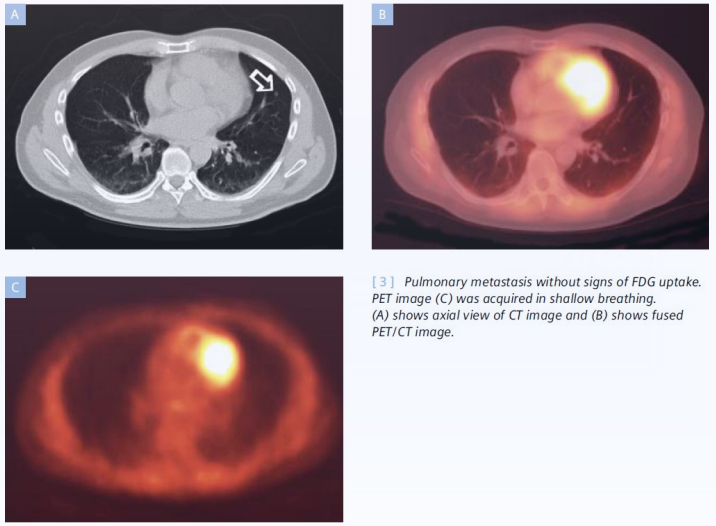
Data courtesy of University of Geneva, Geneva/Switzerland



Metastases from oral cancer - disease progression evaluated by PET•CT

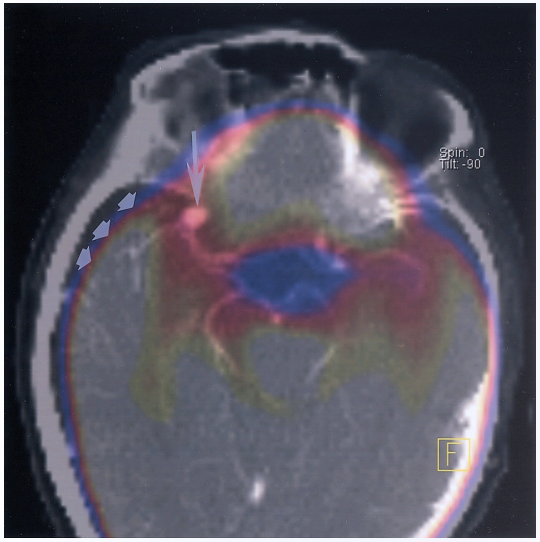
Patient with resected oral cancer sequentially studied with FDG PET•CT. Initial study delineated hypermetabolic metastases in left lung and right hilar node. Follow up study performed after 3 months with interval chemotherapy demonstrates increase in size and number of metastases including new metastases in liver and para aortic abdominal nodes. Comparative evaluation using TrueD software improves reporting efficiency in such sequential studies.

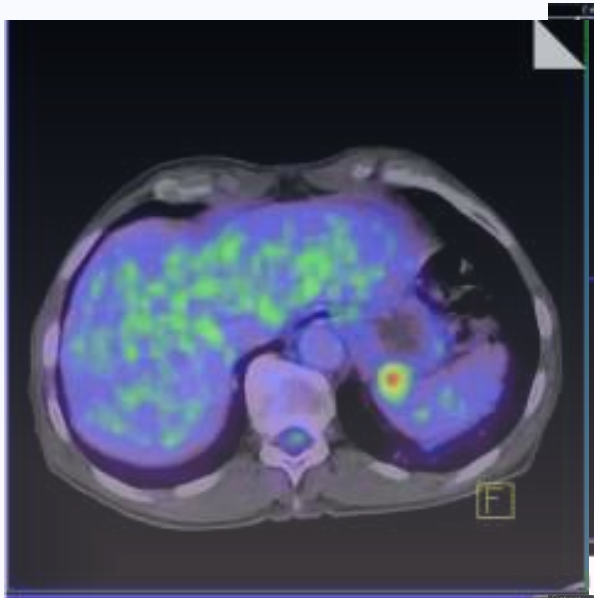
Data courtesy of University of Tennessee, Medical Center, Knoxville, Tennessee/USA

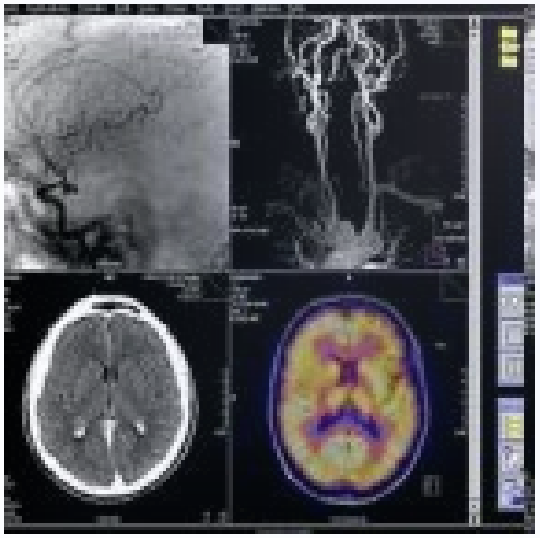


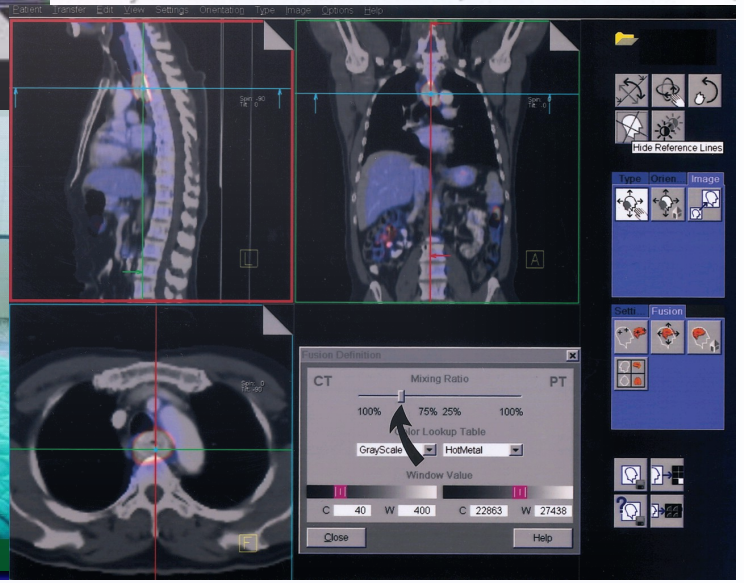
[3] *Pulmonary metastasis without signs of FDG uptake. PET image (C) was acquired in shallow breathing. (A) shows axial view of CT image and (B) shows fused PET/CT image.*

PET•CT fej-, test felvételek, Syngo megjelenítés









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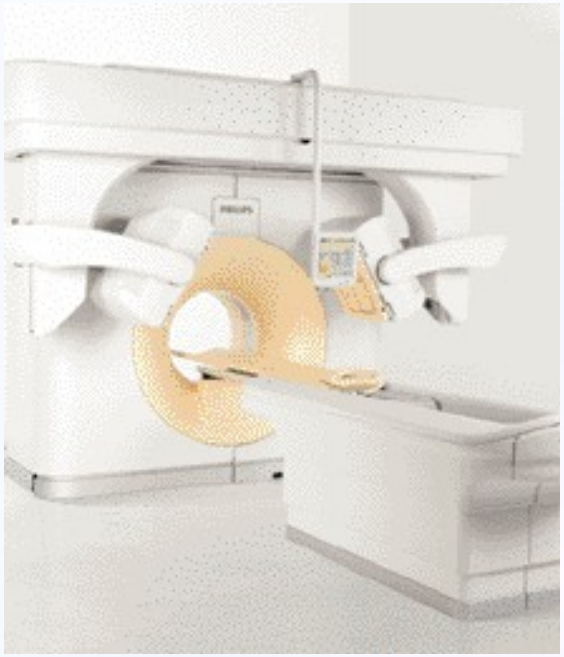
Testkontúr-követő SPECT•CT



CT Physical Assembly

Type of detector	Solid state GOS
Number elements/ channels/fan beam	16,128 32,256 effective with DFS
Generator output	60 kW
kV	90, 120 and 140 kVp
mA	20 to 500 mA; in 1mA inc
Effective heat storage capacity	26 MHU
Anode storage capacity	8.0 MHU
Anode maximum cooling rate	1608 kHU/min
Focal spot (IEC)	Large: 1.0 mm x 1.0 mm Small: 0.5 mm x 1.0 mm

CT Image Quality

Spatial Resolution:	
Ultra high mode	24.0 lp/cm @ cut-off
High mode	16.0 lp/cm @ cut-off
Standard mode	13.0 lp/cm @ cut-off
Noise	0.27% as measured on the Philips system phantom (21.6 cm water equivalent)
Low contrast resolution	4.0 mm @ 0.3% as measured on the 20 cm CATPHAN phantom
Absorption range	-1000 to +3096 Hounsfield units
Temporal resolution	As low as 53 ms using 0.4 sec rotation and adaptive multicycle reconstruction

CT Scan Parameters

Scan times	0.4*, 0.5, 0.75, 1, 1.5, 2 seconds for full 360° scans 0.28*, 0.33 seconds for partial angle 240° scans
Scan field	250 mm, 500 mm
Slice collimation	2 x 0.6 mm, 16 x 0.75 mm, 16 x1.5 mm, 8 x 3.0 mm, 4 x 4.5 mm
Slice thickness	Spiral mode: 0.65 - 7.5 mm variable, axial mode: 0.6 - 12 mm
Rotation speed	0.5 seconds, 0.4 seconds*

CTDI

CTDI vol	Dose Levels
Head	12.85 mGy/100 mAs
Body	6.54 mGy/100 mAs
	(Using IEC standard phantoms)

www.siemens.com/healthcare

Testkontúr-követő SPECT•CT

EPIC-AZ Detectors

True energy independence	Fixed high voltage
Universal flood calibration	One flood for all radionuclides
Non-Anger digital detector	1 ADC/PMT
Field of view (rectangular)	15" x 20" (38.1 x 50.8 cm)
Crystal thickness	0.375" (9.5 mm)
Photomultiplier tubes	55
Lead shielding	700 keV
Shielding to UFOV distance	3.7" (9.4 cm)
Variable magnification	1.0x, 1.46x, 1.85x, 2.19x
TeleLOGIC	Remote diagnostics

Scanner Characteristics

Gantry dimensions (H x W x D) cm	267.3 x 356 x 610
Weight	4,773 kg (10,500 lbs)
Power requirements, SPECT/CT	100 kVA (maximum)
Heat load (gantry)	30,000 BTU/hr
Gantry cooling	Air-cooled
Patient port	73 cm (SPECT) and 70 cm (CT)
Transmission source	CT-AC

JETStream Acquisition

Mobile acquisition console	18" flat panel monitor, keyboard, and trackball/mouse
Spectrum analyzers	16
Energy range	56 - 920 keV
Window adjustment	1% to entire energy range
Spectrum display	Color-coded, graphical, fully interactive
Count capacity	32K per channel
Preset count and/or time	1 count to 2 billion counts, l sec. to >1,000 min.
Image orientation	0°, 90°, 180° and 270°
Patient position display	2 seconds to infinity, decay-based persistence or fixed refresh
Concurrent imaging	Up to 15 simultaneous data sets from a single acquisition

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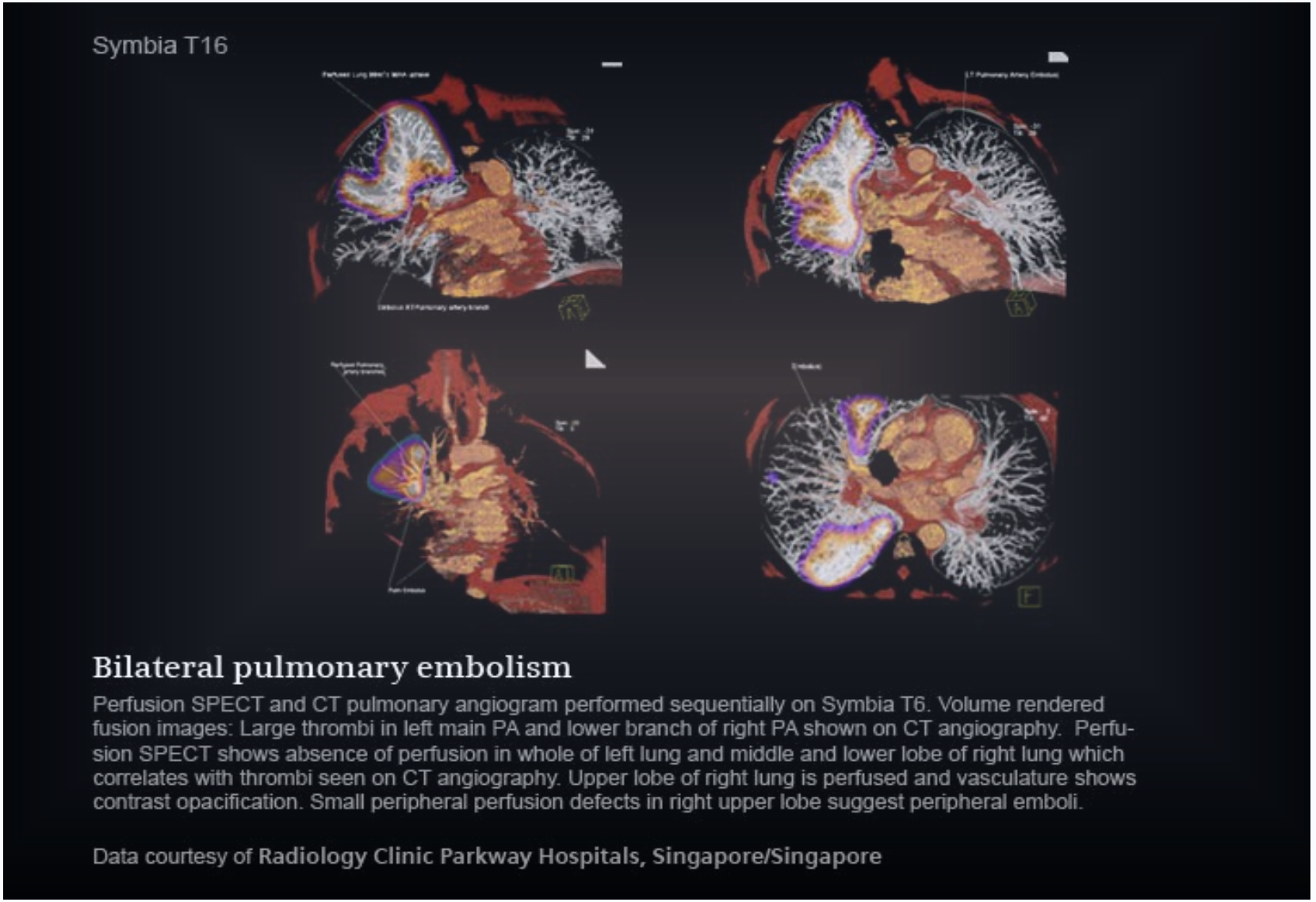
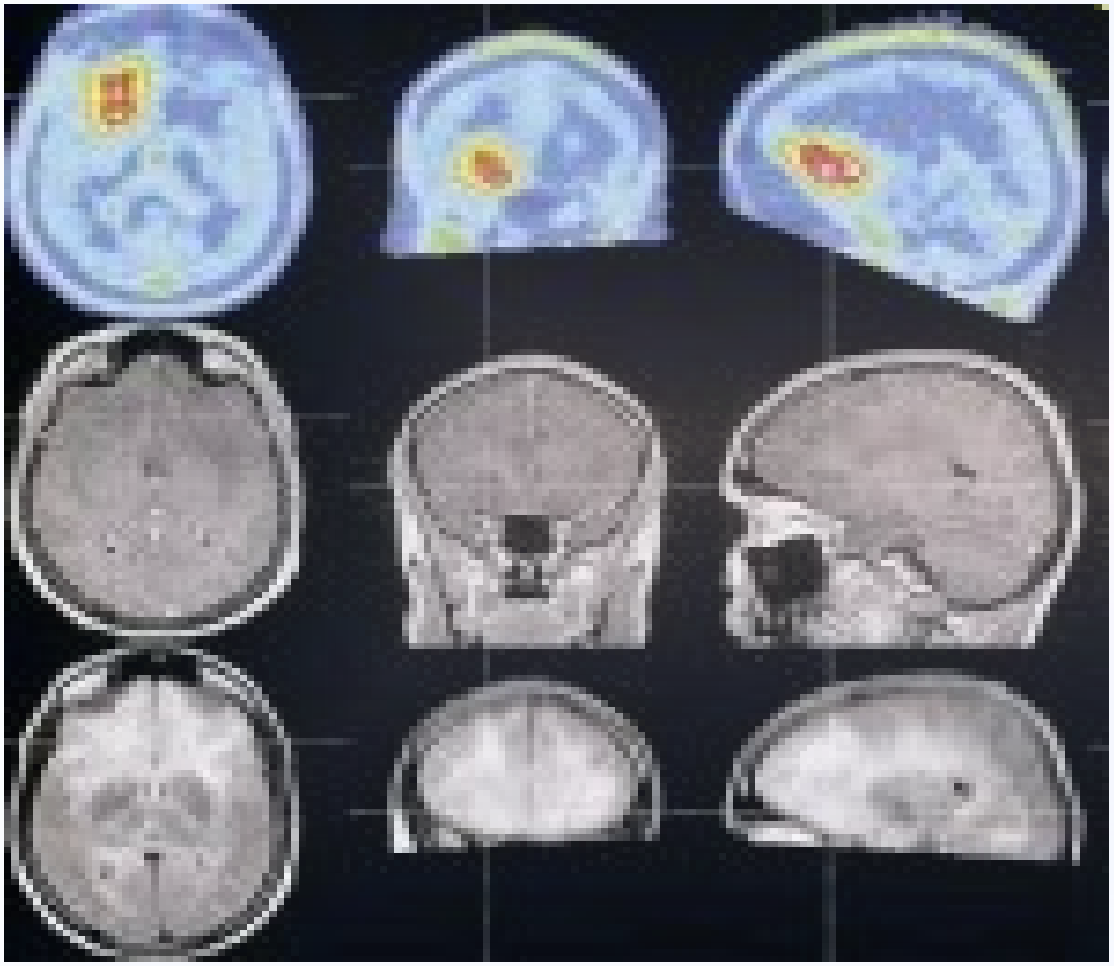
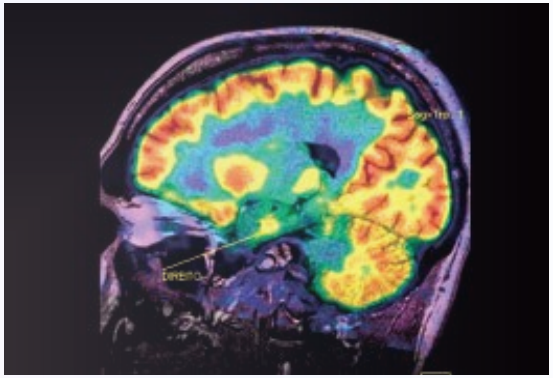
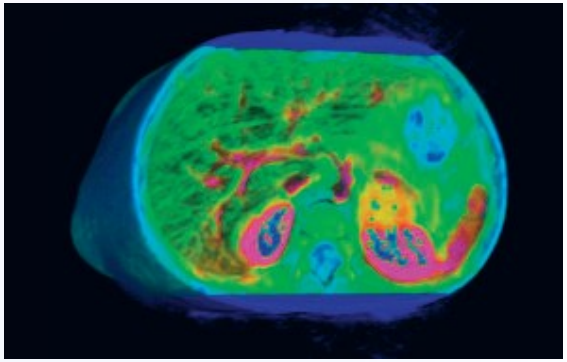
SPECT•CT


Symbia T16
Bilateral pulmonary embolism
Perfusion SPECT and CT pulmonary angiogram performed sequentially on Symbia T6. Volume rendered fusion images: Large thrombi in left main PA and lower branch of right PA shown on CT angiography. Perfusion SPECT shows absence of perfusion in whole of left lung and middle and lower lobe of right lung which correlates with thrombi seen on CT angiography. Upper lobe of right lung is perfused and vasculature shows contrast opacification. Small peripheral perfusion defects in right upper lobe suggest peripheral emboli.
Data courtesy of Radiology Clinic Parkway Hospitals, Singapore/Singapore

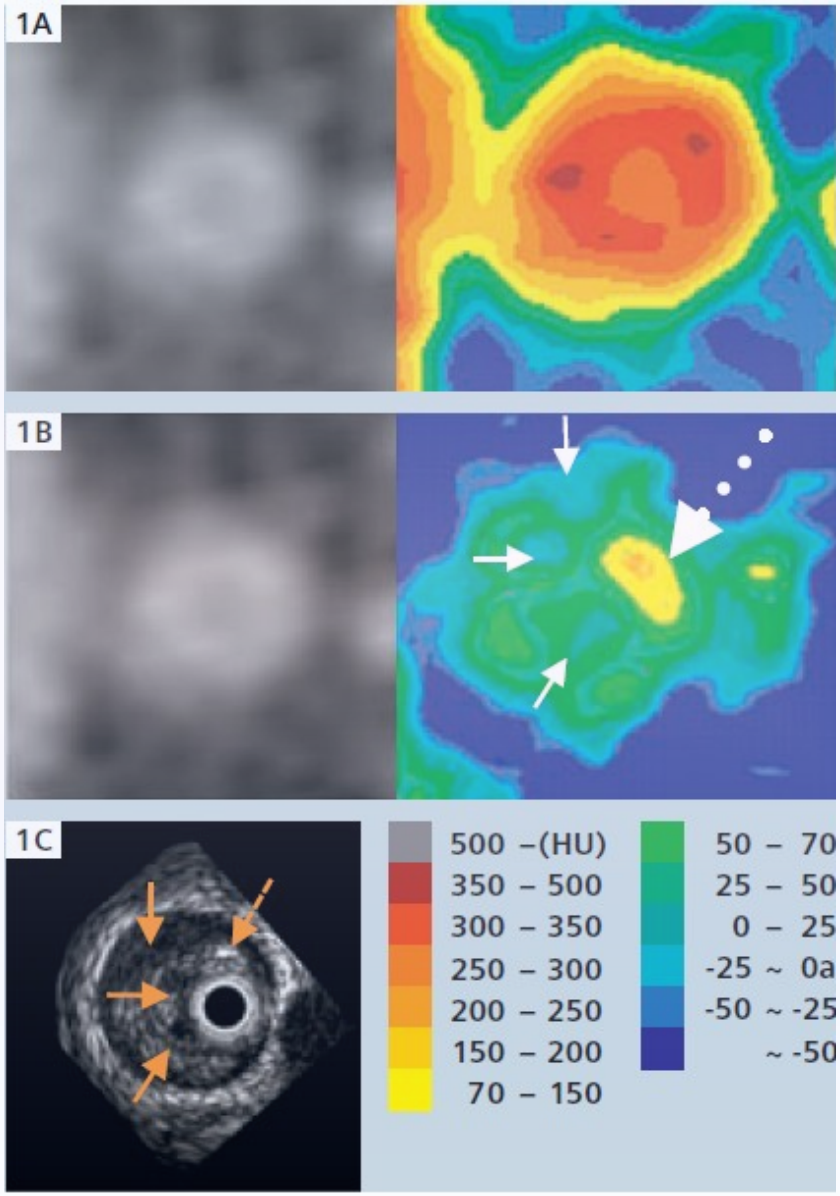
MRI • PET



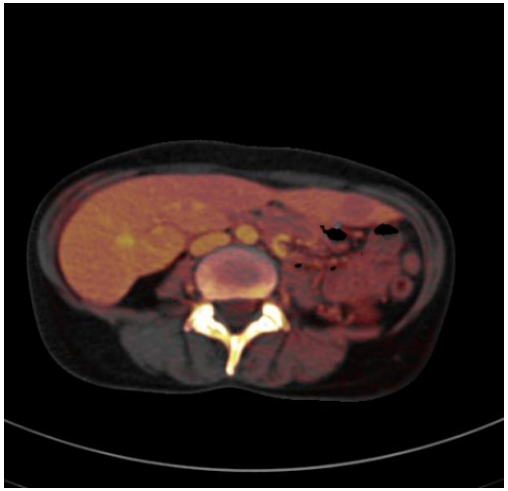




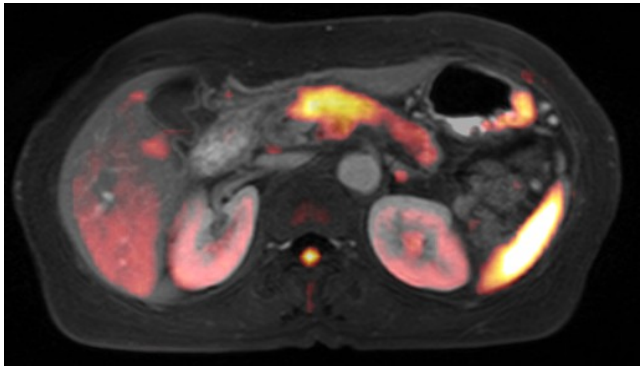
CT, UH


1A
1B
1C
500 –(HU)
350 – 500
300 – 350
250 – 300
200 – 250
150 – 200
70 – 150
50 – 70
25 – 50
0 – 25
-25 ~ 0a
-50 ~ -25
~ -50

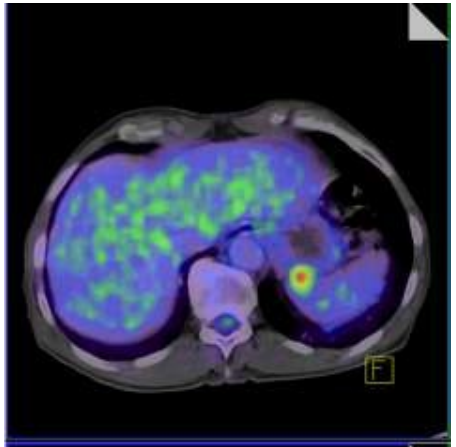
CT, MRI, PET, SPECT

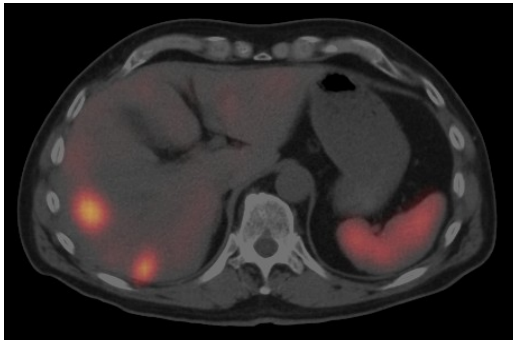


Dual Source CT

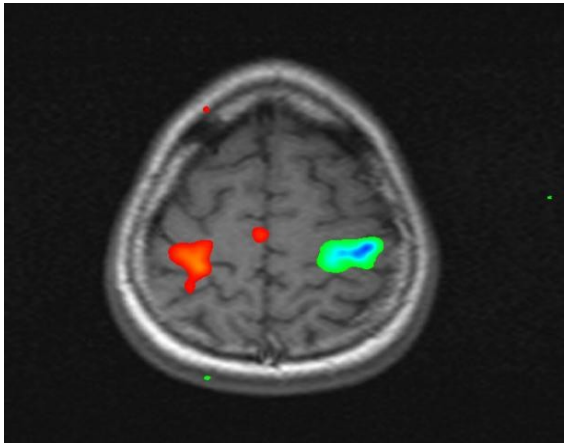


MRI

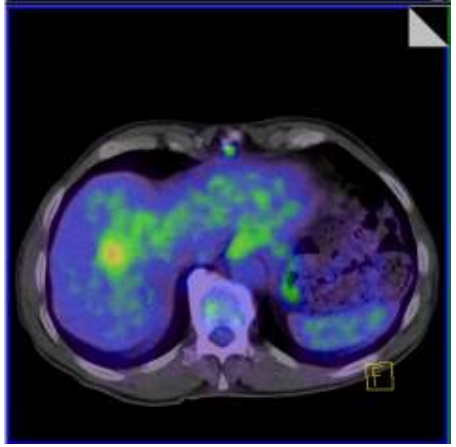




SPECT-CT



fMRI



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