

PHILIPS

The bright Future of Diagnostic Imaging

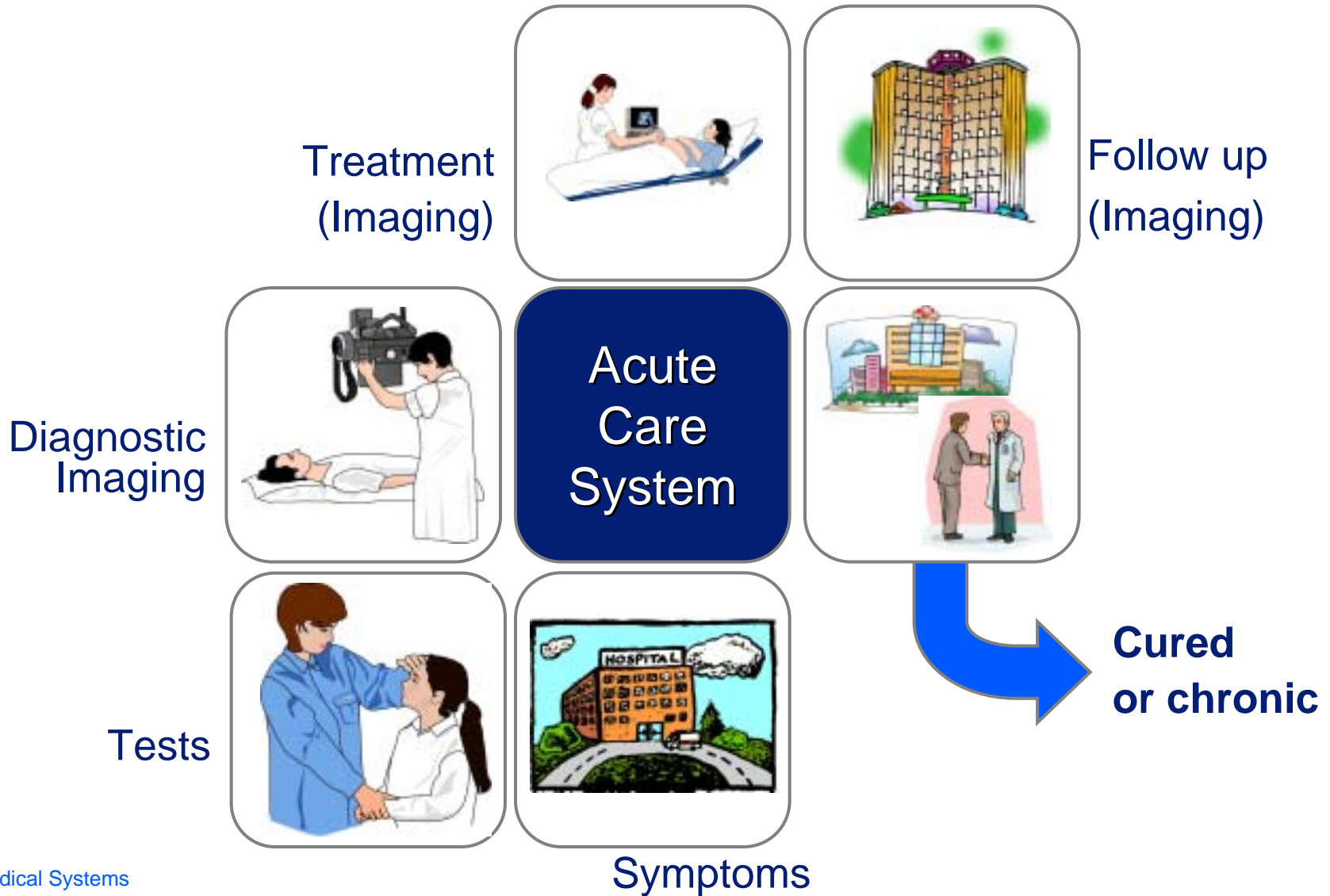
Paul Smit

Senior Vice President Medical Systems

Overview

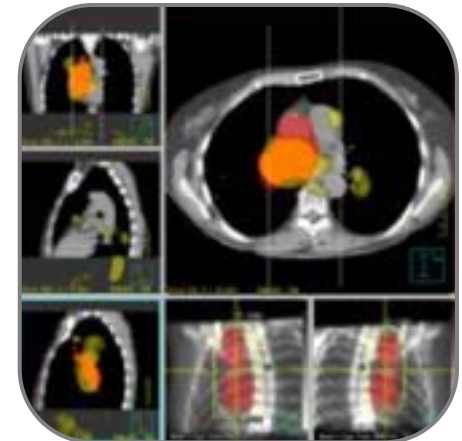
- The role of Imaging in healthcare
- State of the art
- Philips' position
- New developments

Role of imaging in healthcare



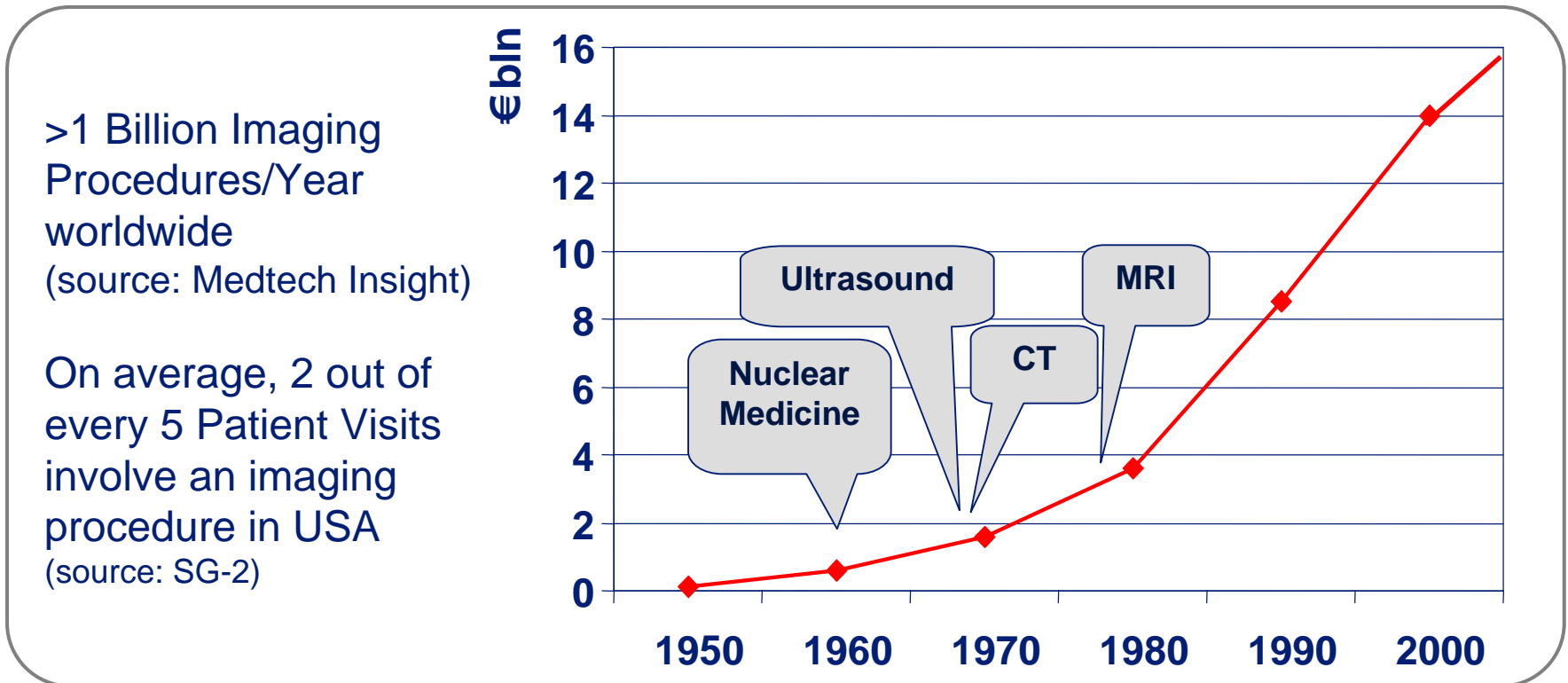
Role of Diagnostic Imaging in Healthcare

- Determine nature, location and size of disease in patients with symptoms
- Guide interventions
- Monitor the progress of treatment



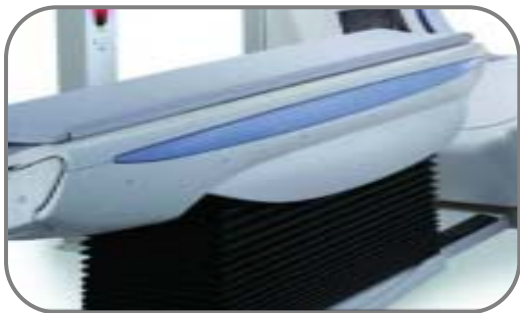
Market for Imaging has shown consistent growth

Growth is driven by new applications, increasing accuracy and increasing speed



Medical Technology creates proven benefits

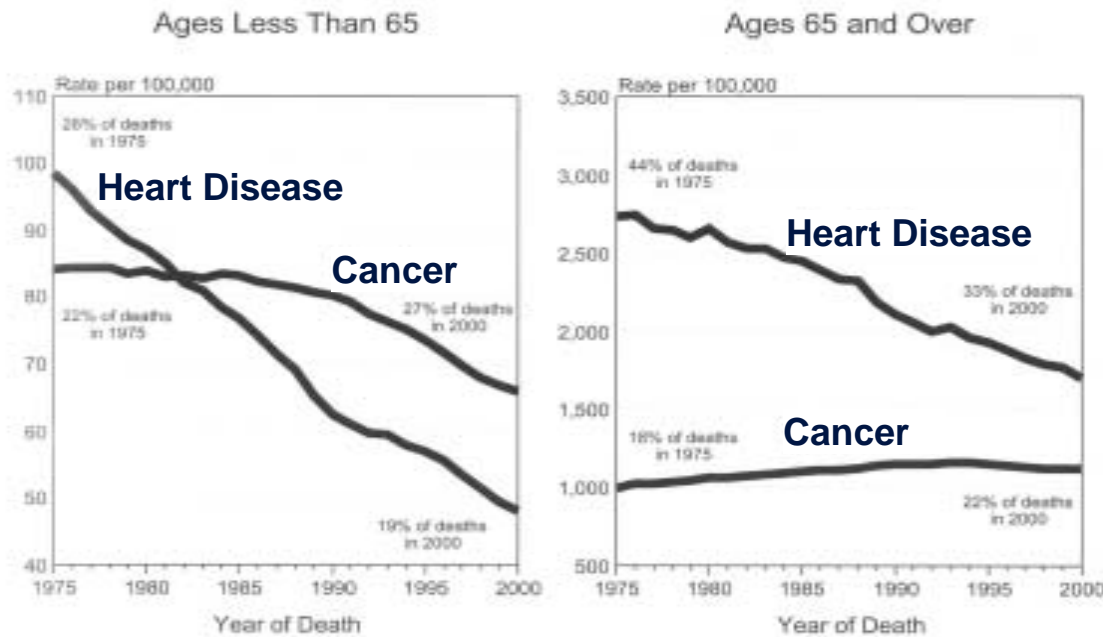
- “New technologies often bring health improvements and productivity benefits.”
- “Around 70% of the survival improvement in heart attack mortality is a result of changes in technology.”



Source: Technology Benefits based on Study by Cutler and McClellan

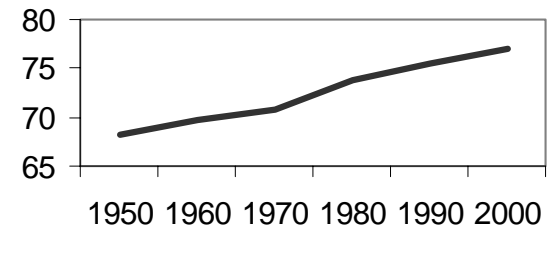
....which translates into a healthier population

**US Death Rates
1975-2000**



Source: NCI-B public use data file. Rates are per 100,000 and age-adjusted to the 2000 US standard population by 5-year age groups.

**US Life Expectancy at Birth
1950-2000**



Source: NCHS

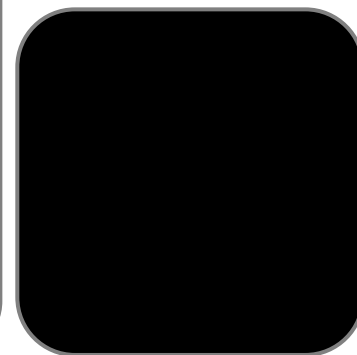
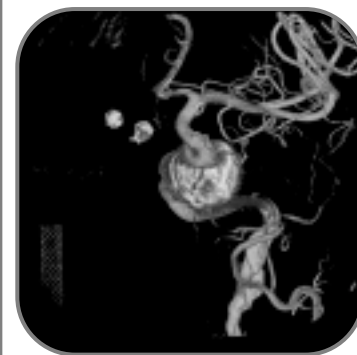
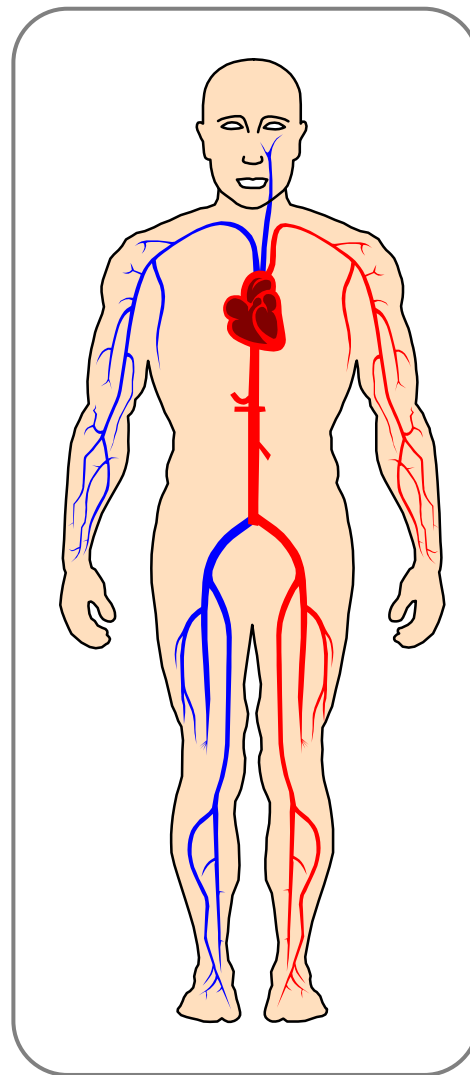
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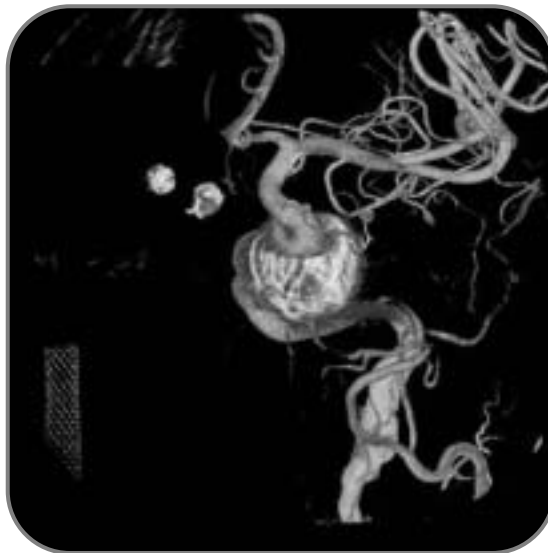
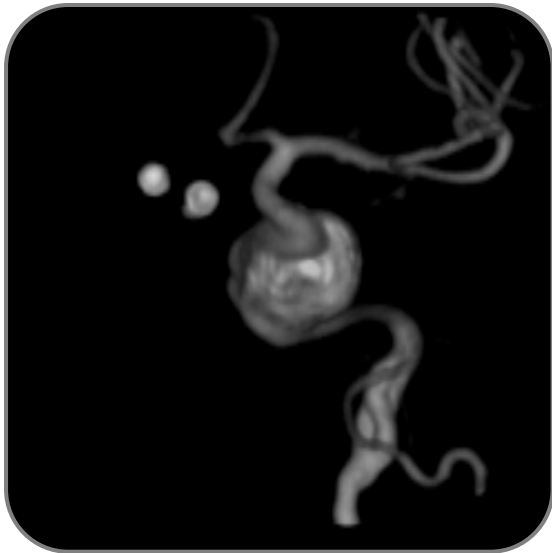
CardioVascular X-Ray

Average price: € 1 mln

- Diagnosis of bloodvessels
 - Heart
 - Brain
 - Body
- Guides treatments of the cardiovascular system
 - Clot removal , e.g. dottering
 - Stent placement
 - Aneurysms repair
 - Arythmia repair



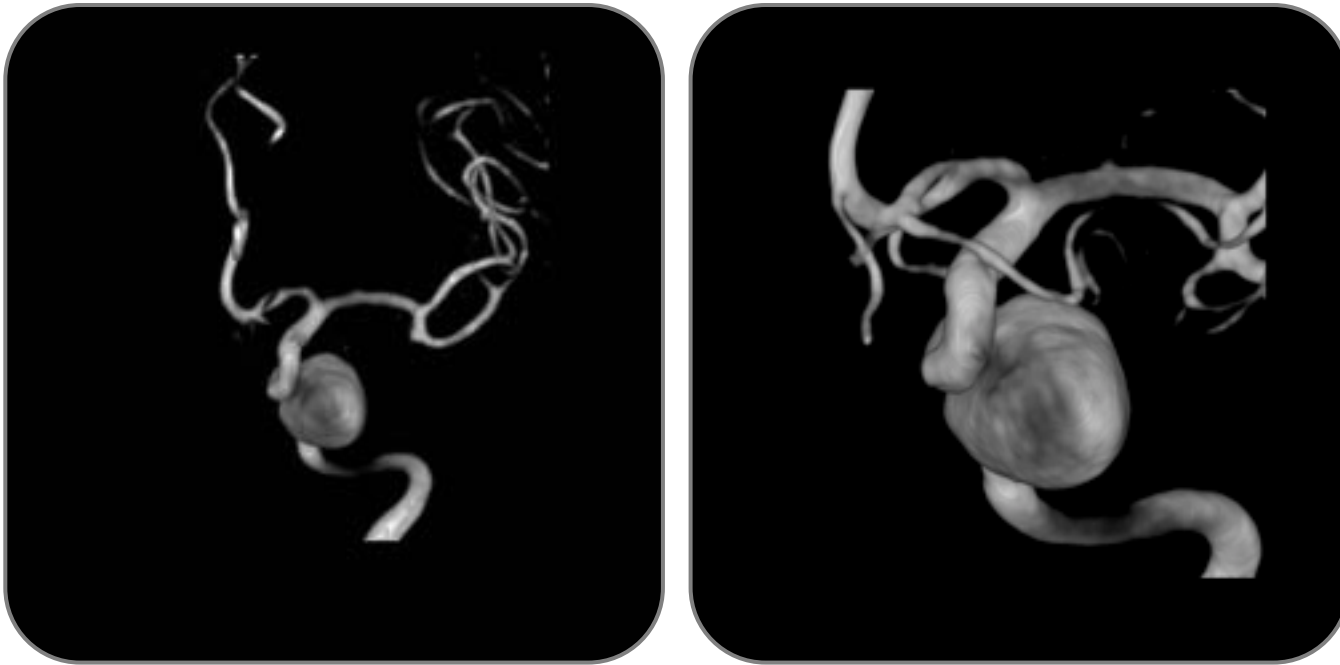
Philips' continuous improvements in Cardiovascular X-Ray



**250x
finer details**

	1999	2003
Detail visible	0.001 mm ³	0.000,004 mm ³
Measurement time	35 s	5 s

Repairing arteries in the brain



Zooming allows the cardiologist to enlarge the microscopic images to the desired size

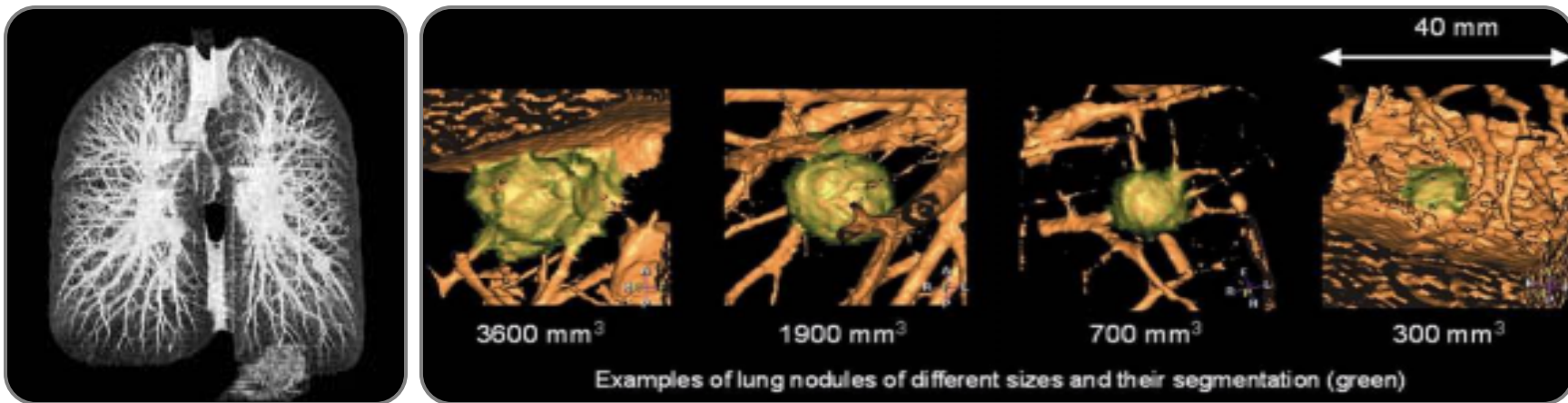
Philips' continuous improvements in Computed Tomography, CT

Average price €0.4 – 1 mln

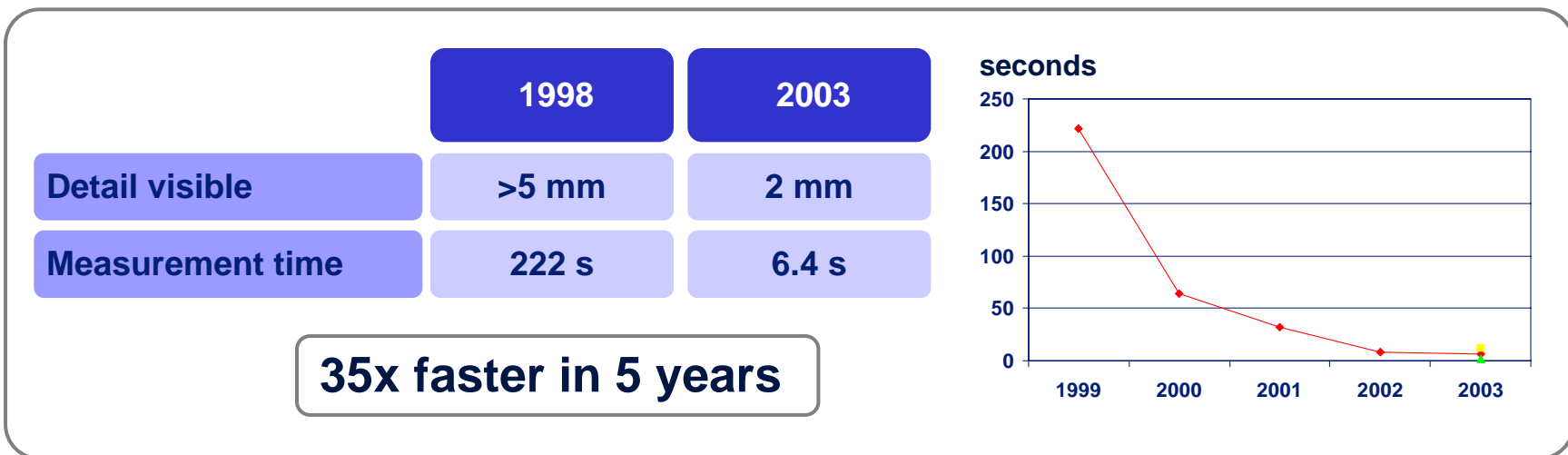
- Diagnosis of anatomy, all body parts
- Workhorse of Radiology
- Continuously faster and more accurate



Diagnosing lung cancer



- Courtesy of Wiemker et al. Medica Mundi 2003



Philips' continuous improvements in MRI

Average price : €0.6 - 3 mln

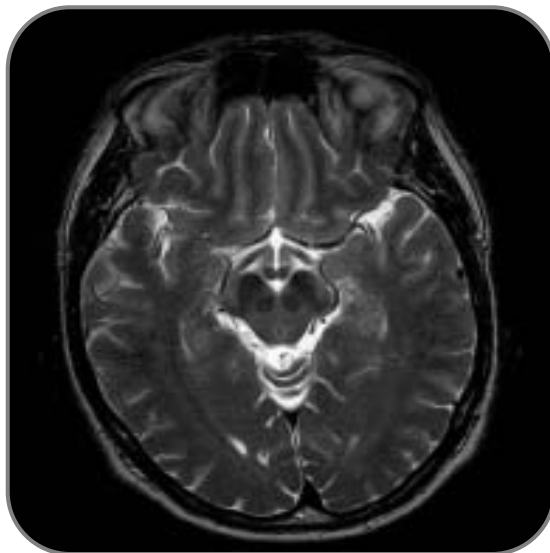
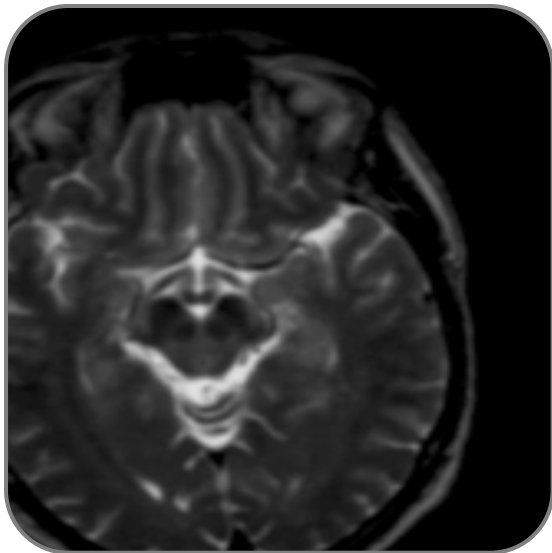
- Diagnosis of anatomy, most body parts
- Unique in imaging soft tissue, such as the brain and nervous system
- Continuously faster and more accurate



12 seconds



Analyzing the brain



**15x
faster**

	1998	2003
Detail visible	1 mm ²	0.06 mm ²
Scanning time	90 s	8 s

Philips' continuous improvements in Ultrasound

Average price : € 50 – 300 k

- Most cost-efficient imaging technology
- Wide array of applications, incl. cardiovascular
- Anatomy of many parts of the body
- Obstetrics/Gynecology



Live 3-Dimensional Ultrasound

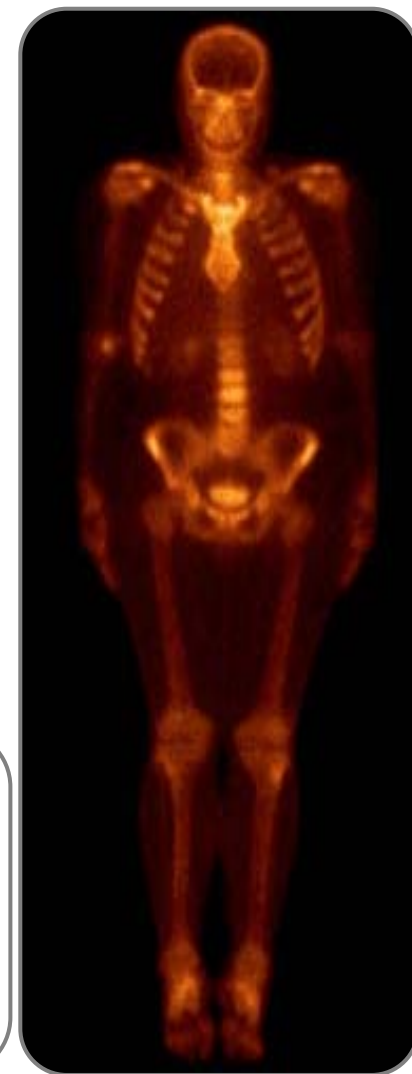


	1998	2003
Signal / noise	5	25
Procedure time	20 min.	5 min.

Nuclear Medicine

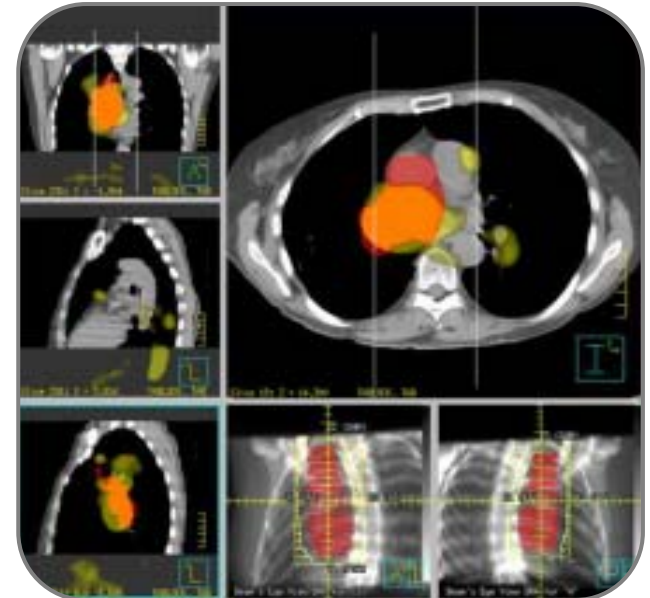
Average price : € 0.4 - 2 mln

- Most sensitive technology
- Gold standard to assess heart infarction
- Gold standard to detect primary cancer and metastases
- Increasingly used for brain (infarction)



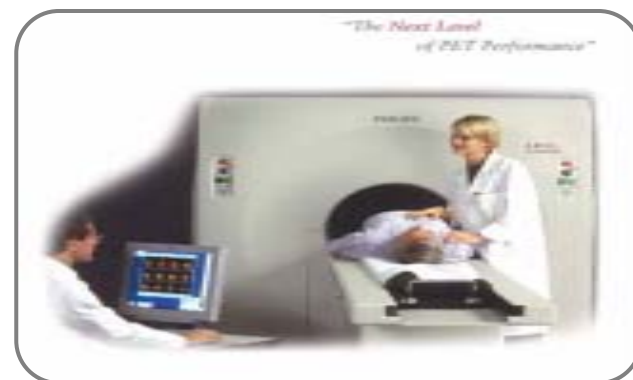
Philips' trackrecord of continuous improvements in Nuclear Medicine

- GEMINI: worlds first and only “open” Positron Emission Tomography (PET) – CT
- 3D registration of PET and CT data
- Two scans for the price of one
- Much better localization and identification of disease
- Improved Radiation treatments



And reduced the cost per patient

- Greater than 50% reduction in scanning time
 - 60 minute scans reduced to less than 30 minutes
 - Enhanced image quality
 - True clinical flexibility



...Continuous improvement in Performance, drives usage and creates new procedures

- X-Ray: repair of brain vessels
- CT: screening for lung cancer, cardiac CT, virtual colonoscopy
- MR: whole body cardiovascular scans, cardiac MR, orthopedics
- US: Biopsy guidance, mammography
- CT-PET: cancer localization and staging, monitoring of cancer treatment



... No wonder Imaging Systems are widely recognized for their impact

- MR and CT are considered the most important innovations in healthcare of the last 20 years

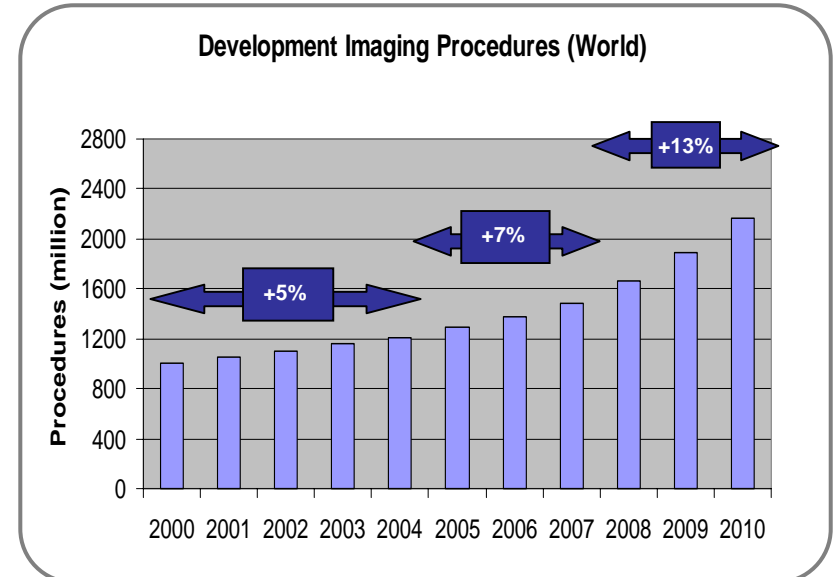


Fuchs &, Sox Health Affairs 2001

....Which drive continuous growth in Imaging

Threefold increase in this decade:

- Aging population
- New cancer, Cardio Vascular and Neuro applications
- Growth of Image guided interventions
- Molecular Imaging



Source: SG-2, Philips

Overview

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Philips is leading in many imaging areas

1 in Cardiovascular X-Ray

1 in digital X-Ray and digital Ultrasound in Cardiovascular Ultrasound

1 in Nuclear Medicine

1 to market with 16 slice CT

1 in high-field MR

1 in oncology simulation and planning

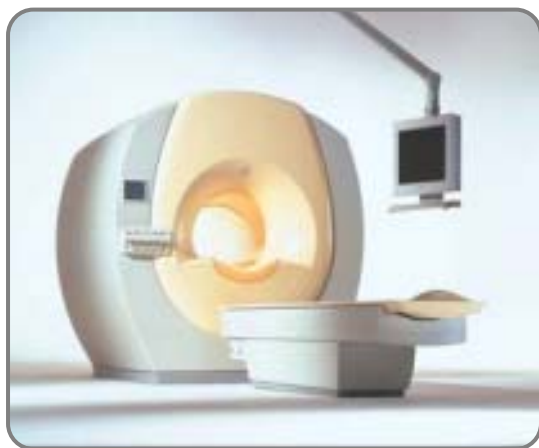
Technology leadership:

Re-use of Unique technology from Philips Research



Xres™
extreme resolution

From MRI



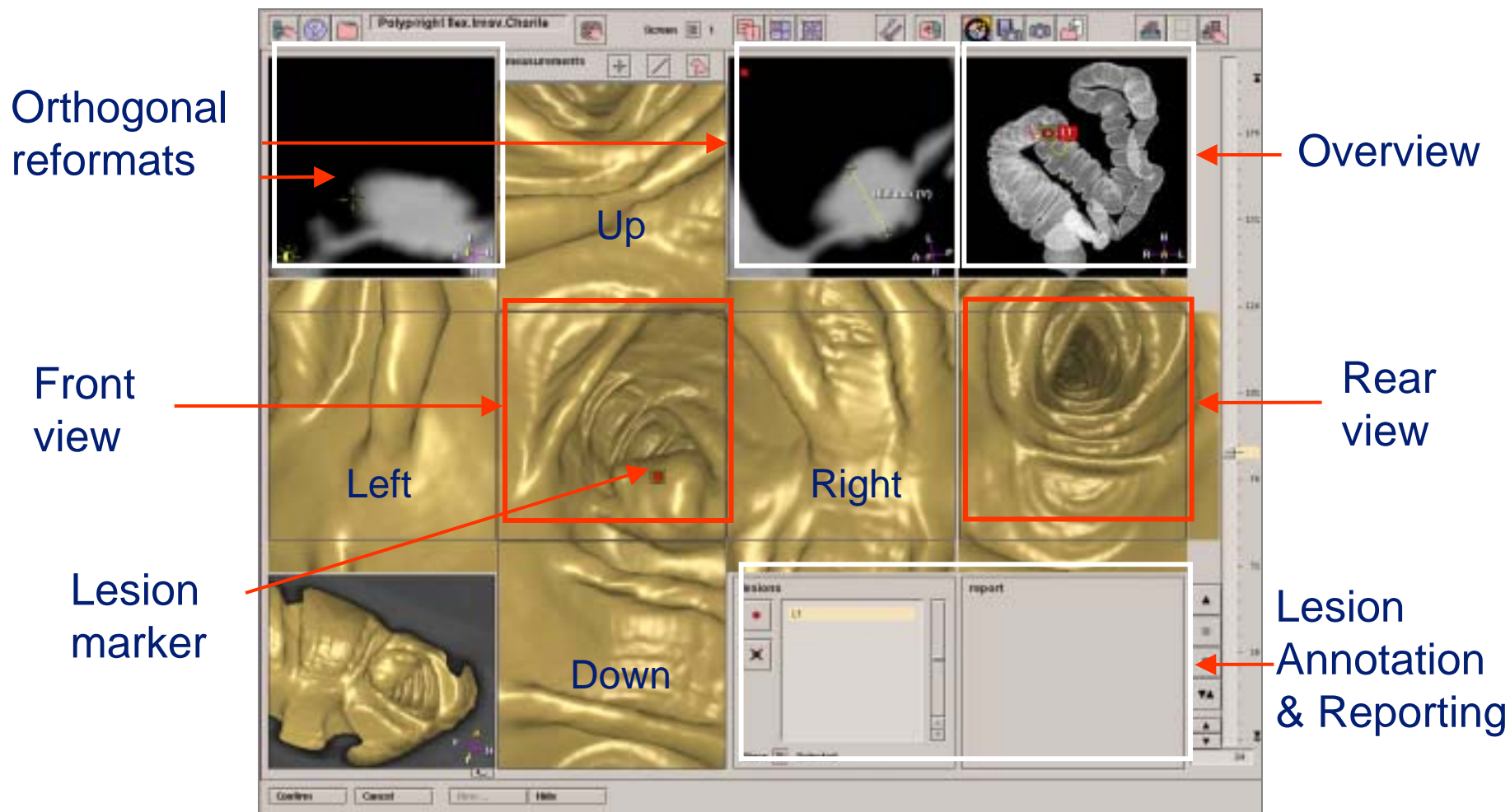
To Ultrasound



To X-Ray



Clinical Leadership through collaborative research: Virtual Colonoscopy with CT

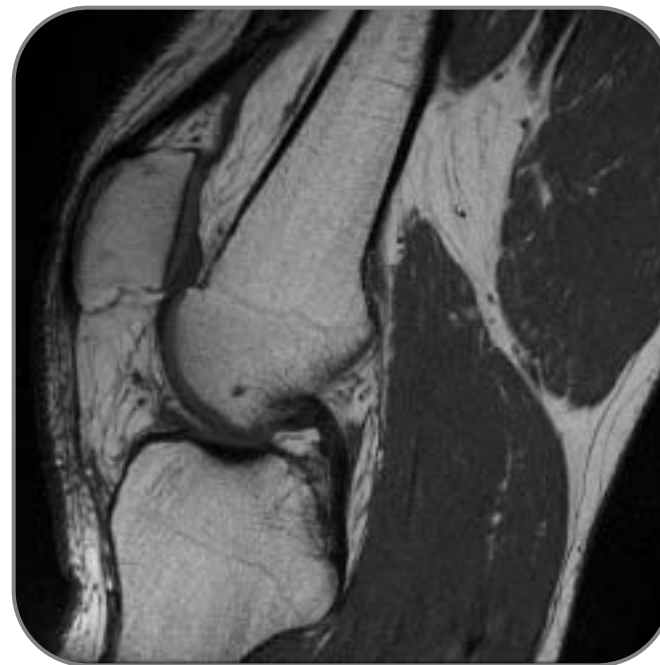
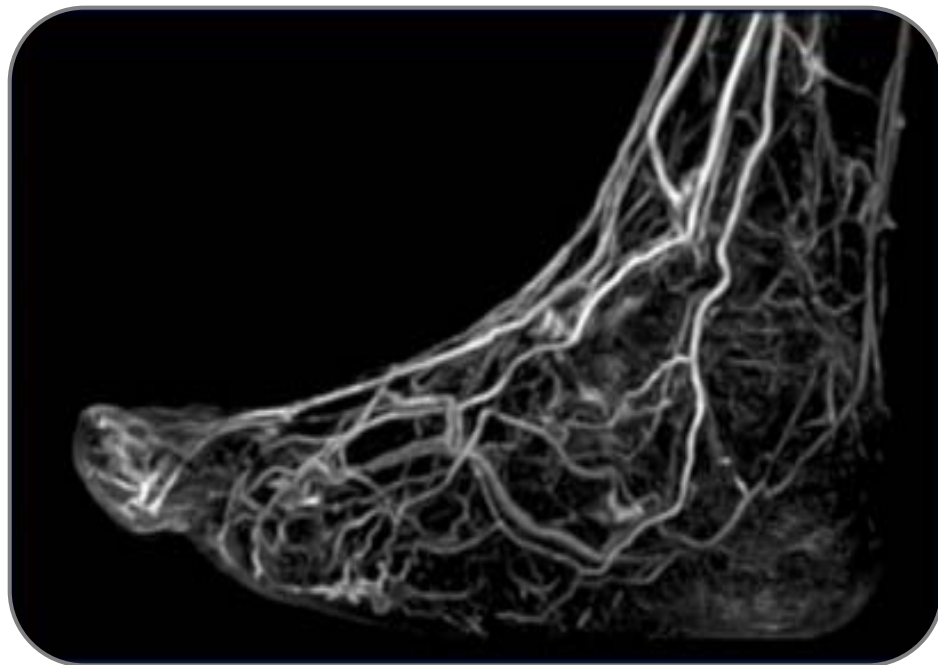


Clinical Leadership through collaborative research: Virtual Colonoscopy with CT



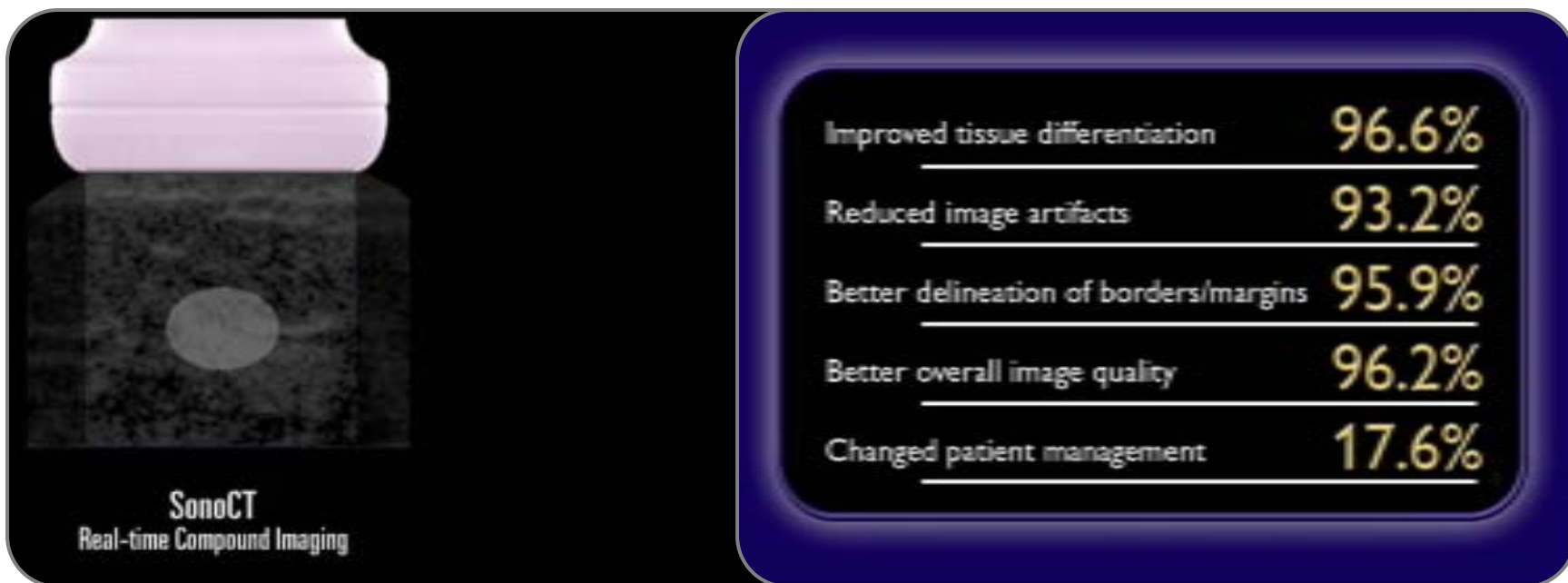
Clinical Leadership through collaborative Research: Stunning details with MR

- Fast and very sharp images



High Resolution: 0.04 mm³

Clinical Leadership through collaborative research : Ultrasound



More accurate US images can change the way patients are treated

Overview

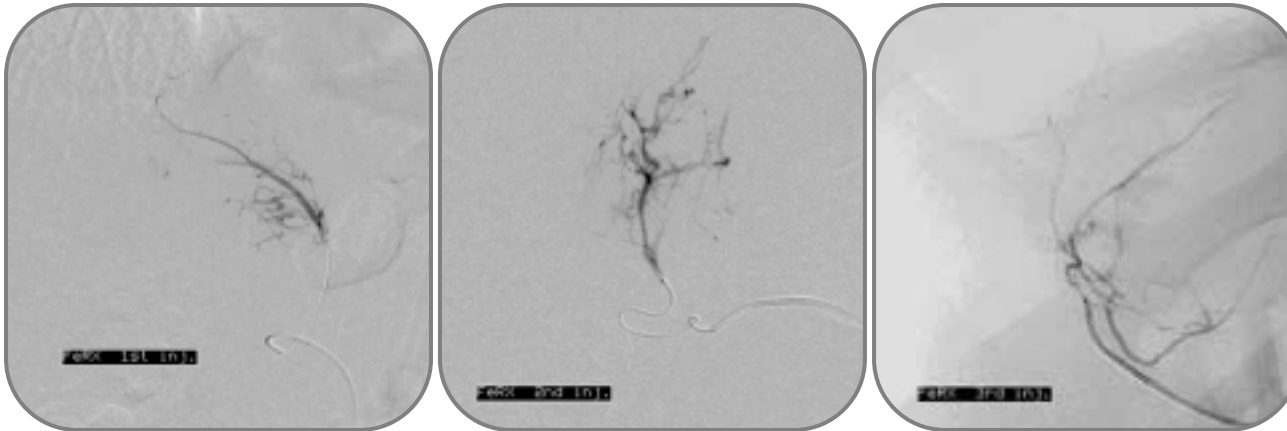
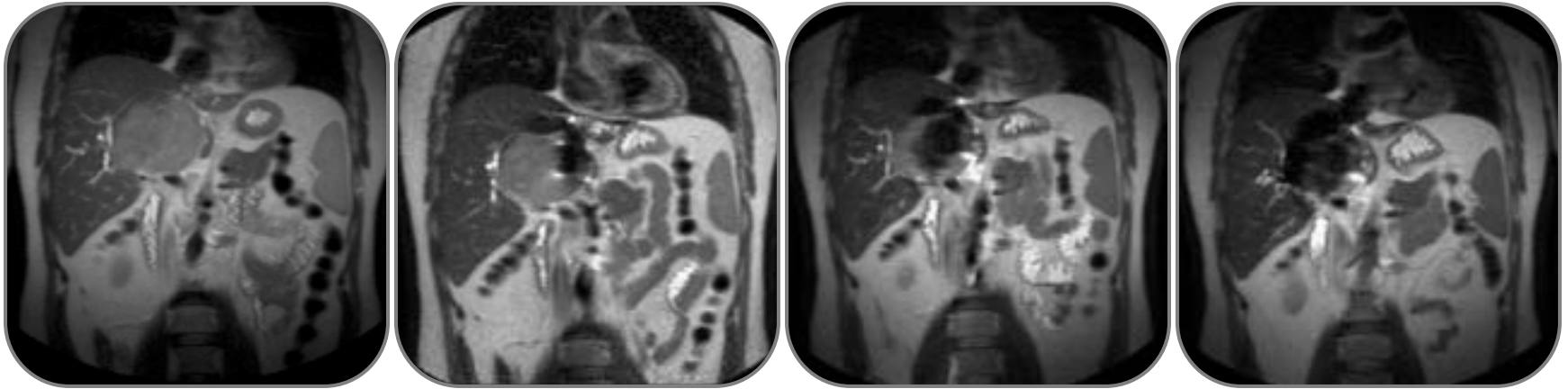
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Fusing MRI and X-Ray for targeted drug delivery



XMR-guided targeted drug delivery

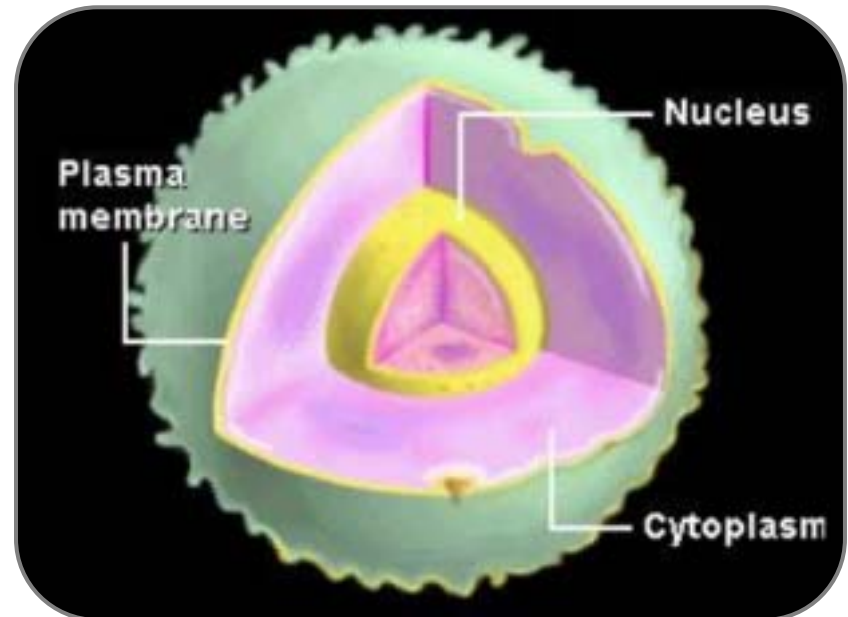
(FeRx in HCC)



Courtesy: UCSF

Molecular Imaging

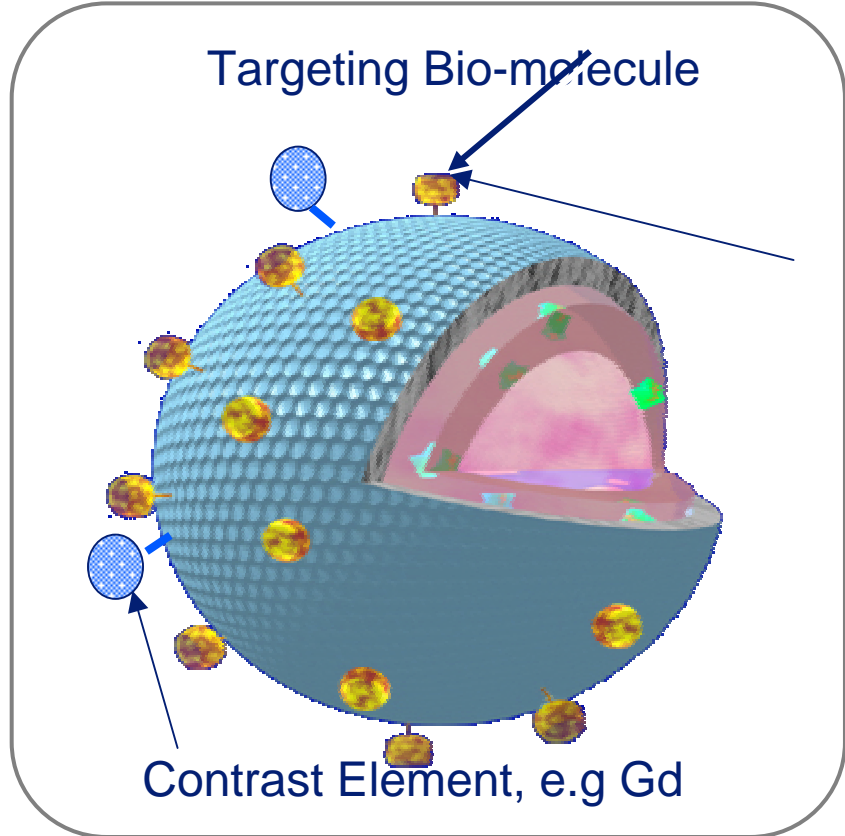
- Images the cells at work inside the living body
- Allows earlier detection and characterization of disease
- Early assessment of treatment



Molecular Imaging: the key ingredients



Imaging Modalities



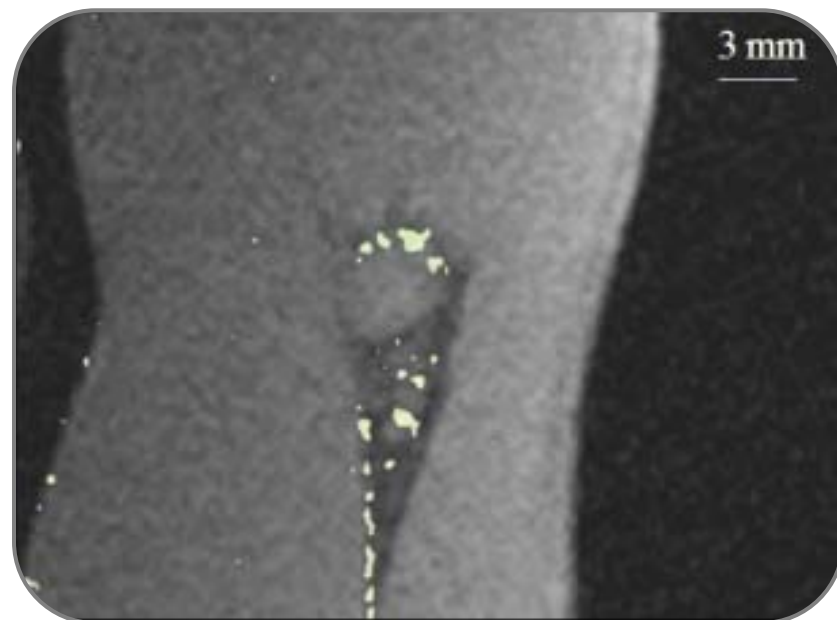
Targeted Contrast Agents

Speeding up time-to-market of new imaging procedures



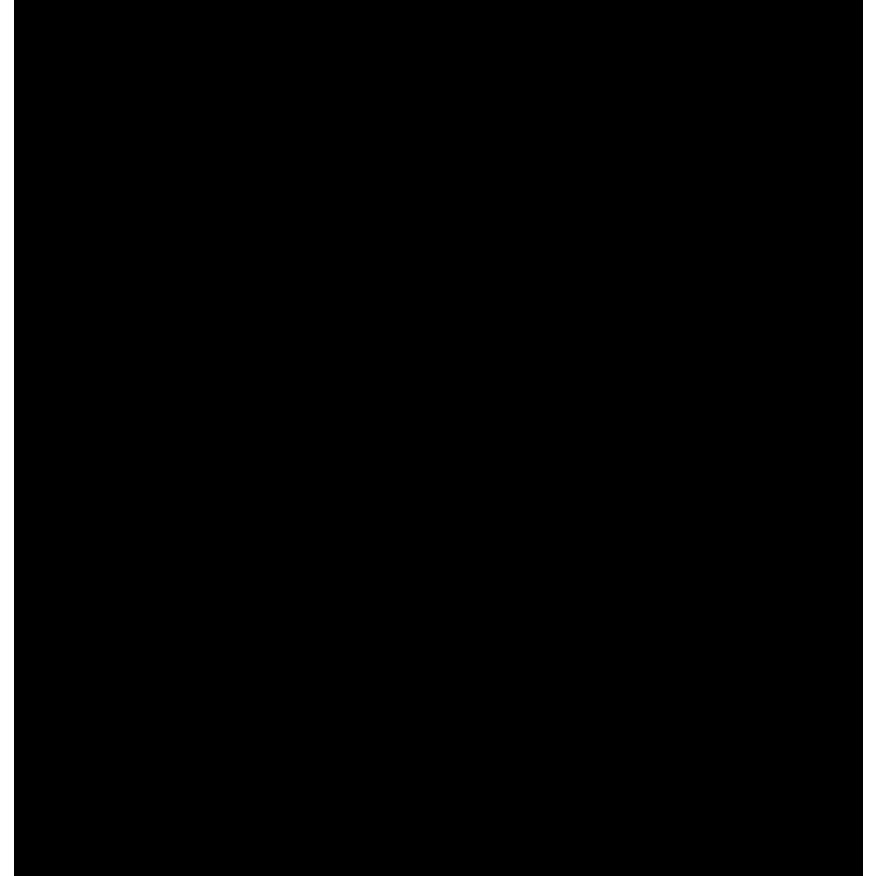
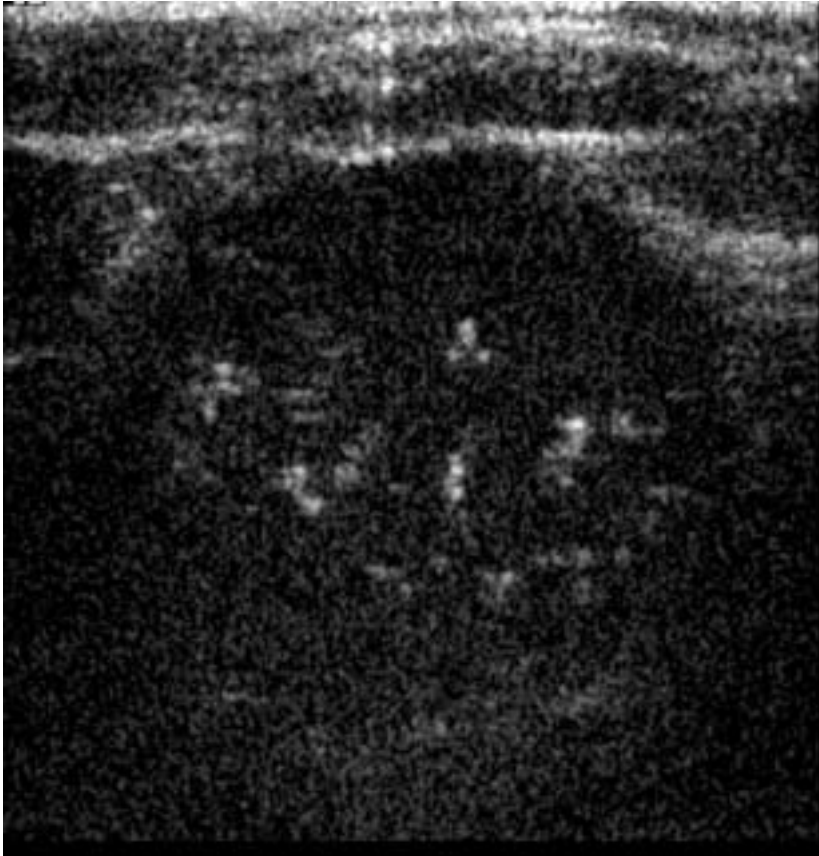
Clinical areas

- Oncology
- Cardiology
- Neurodegenerative diseases of the brain



Courtesy: S. Wickline et al. Washington University, St Louis, USA

MR: Seeing the tumor grow



- As new micro arteries are developing....

Summarizing

- Imaging has made a big impact on healthcare over the last decades
- Continuous Technology development for better and faster diagnosis while lowering costs
- Future is bright as true Molecular Imaging is coming in sight

