

Multi Modality Integration Barriers to commercialization

Peter Luyten

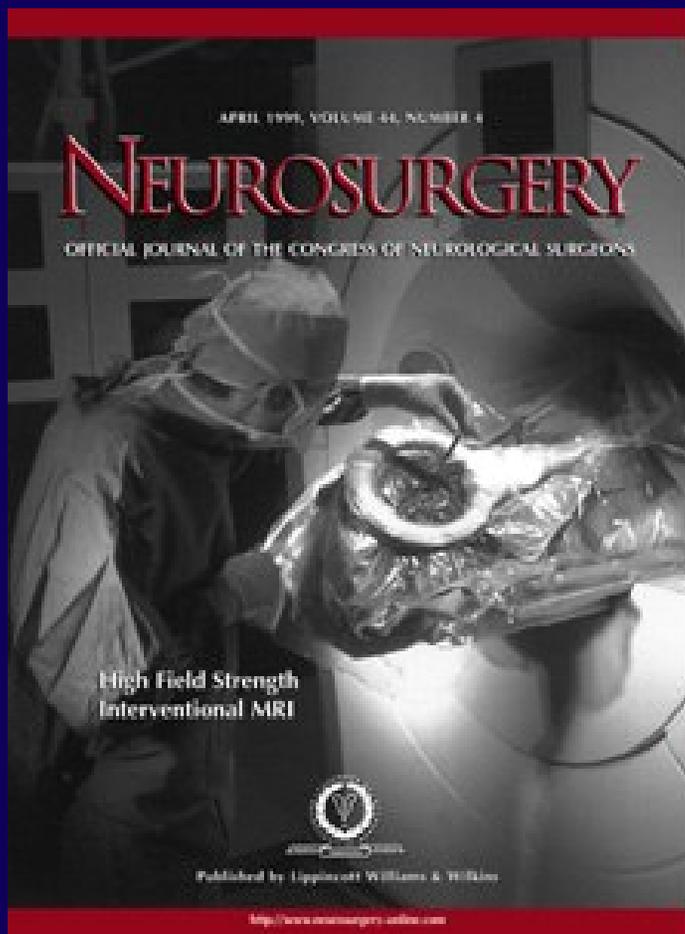
PHILIPS

The Introduction of “XMR”



IMR suite at University of Minnesota, Minneapolis

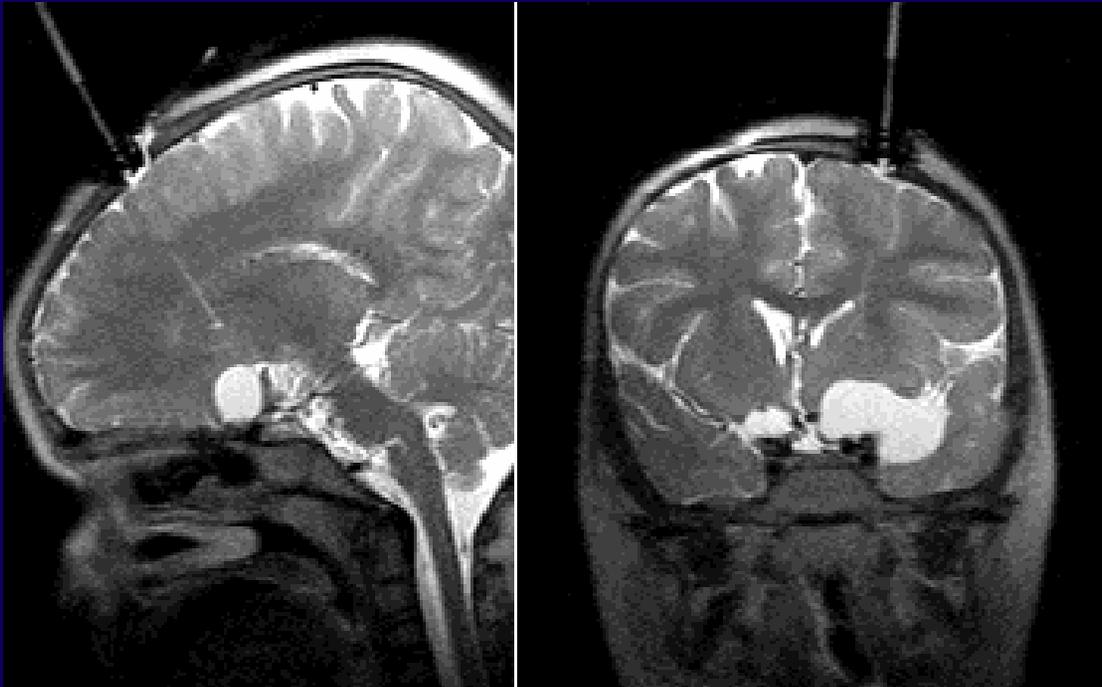
MR-guided neurosurgery



**ON THE COVER:
A biopsy being
performed through
one of the elements
of an interventional
head coil.
Interventional
MRI suite,
University of Minnesota
(see Hall et al., pp 807-814)**

Neurosurgery 44, 807- 814 (1999)

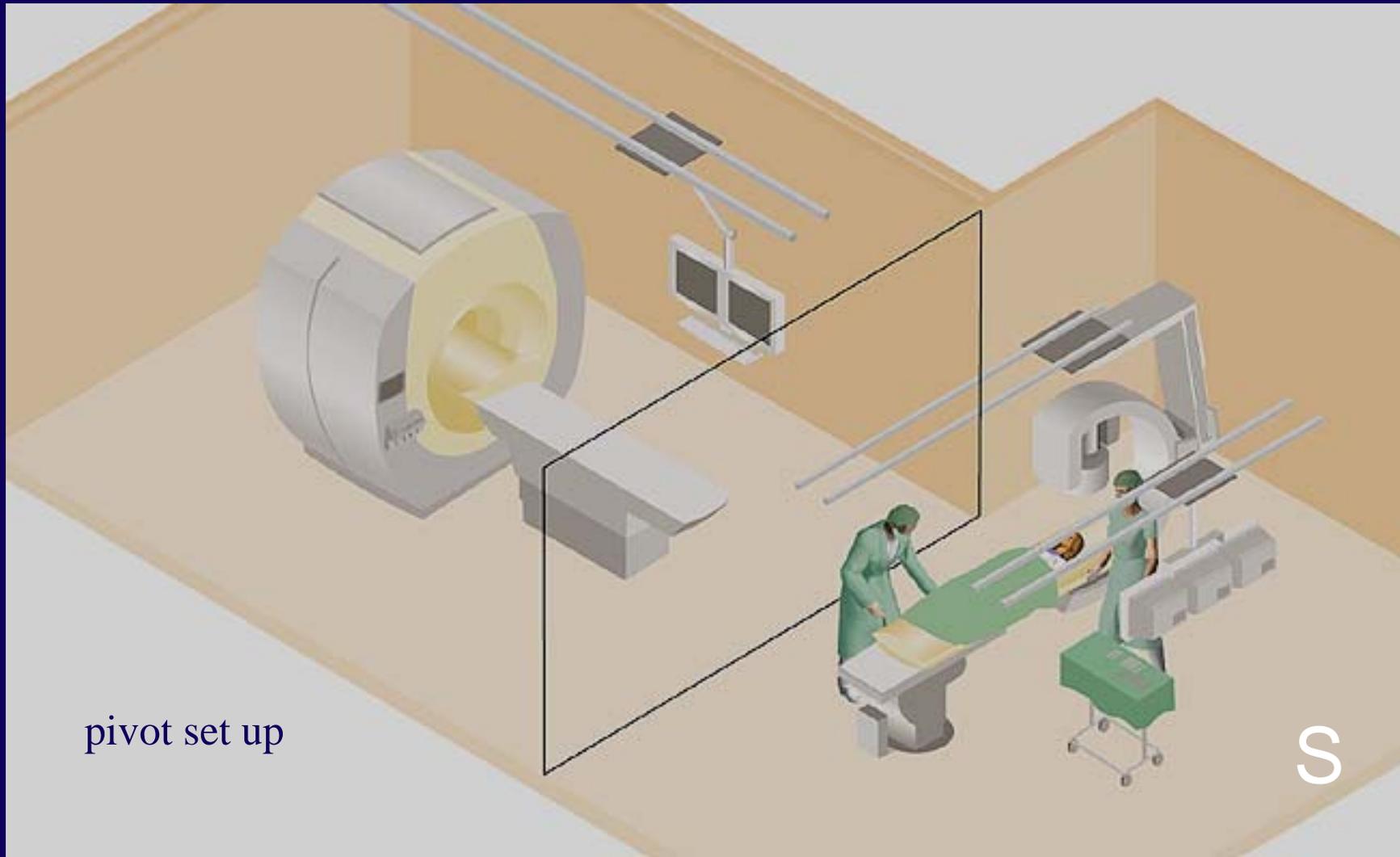
Real-time interactive biopsy guidance
cyst drainage / P32 administration



interactive real time scanning (0.6 sec single-shot TSE)

Courtesy: University of Minnesota, Minneapolis

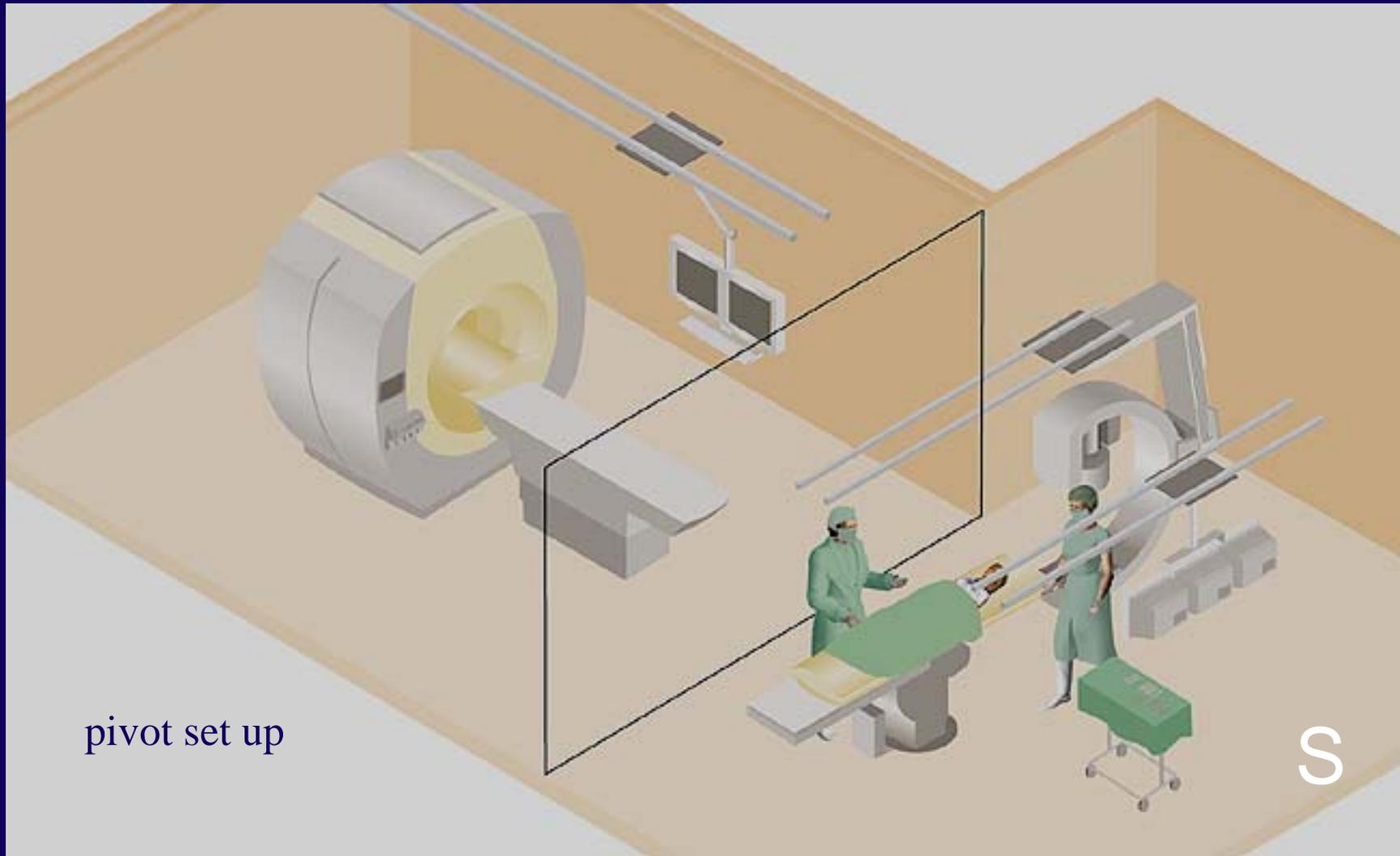
The XMR suite



pivot set up

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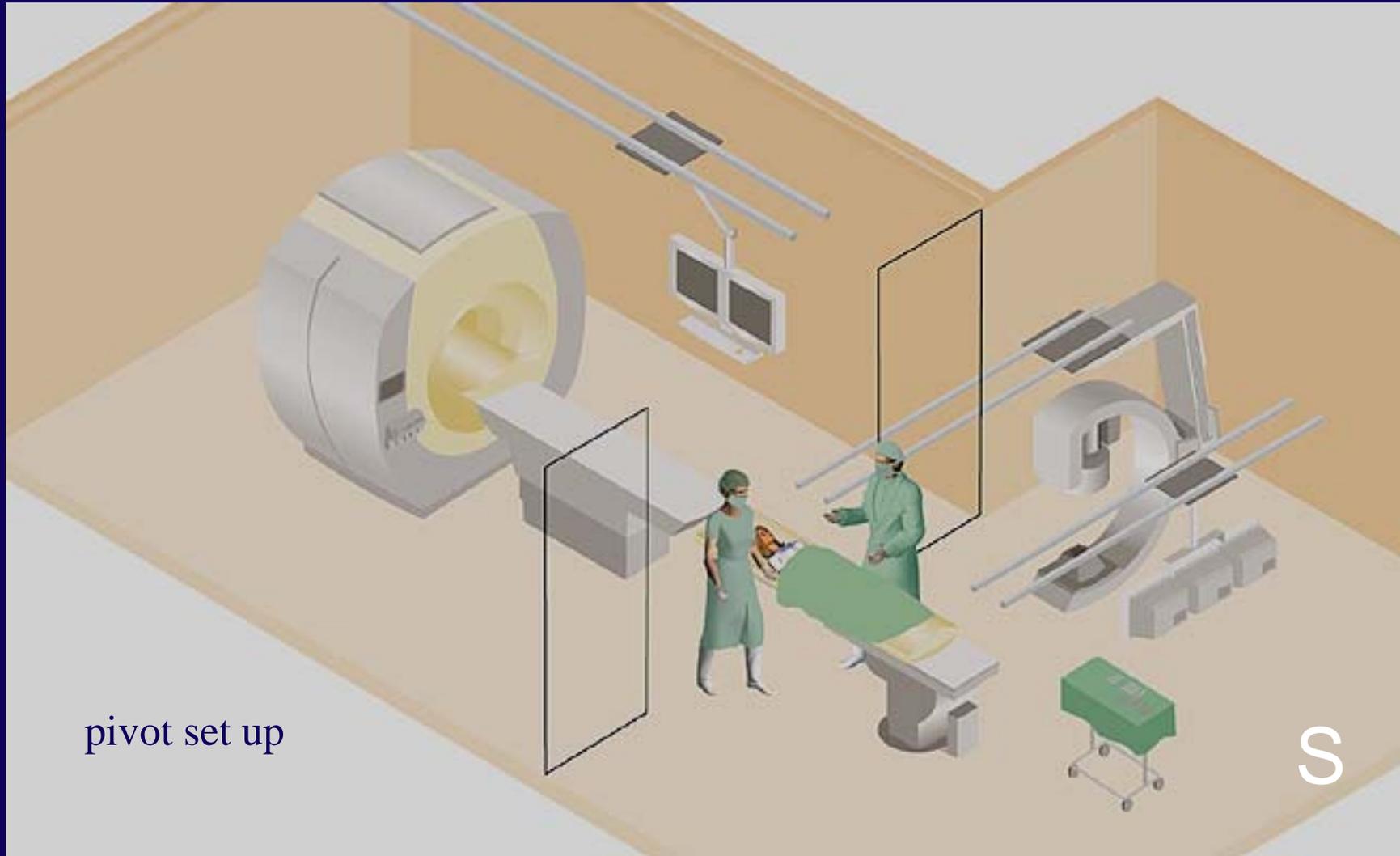
The XMR suite



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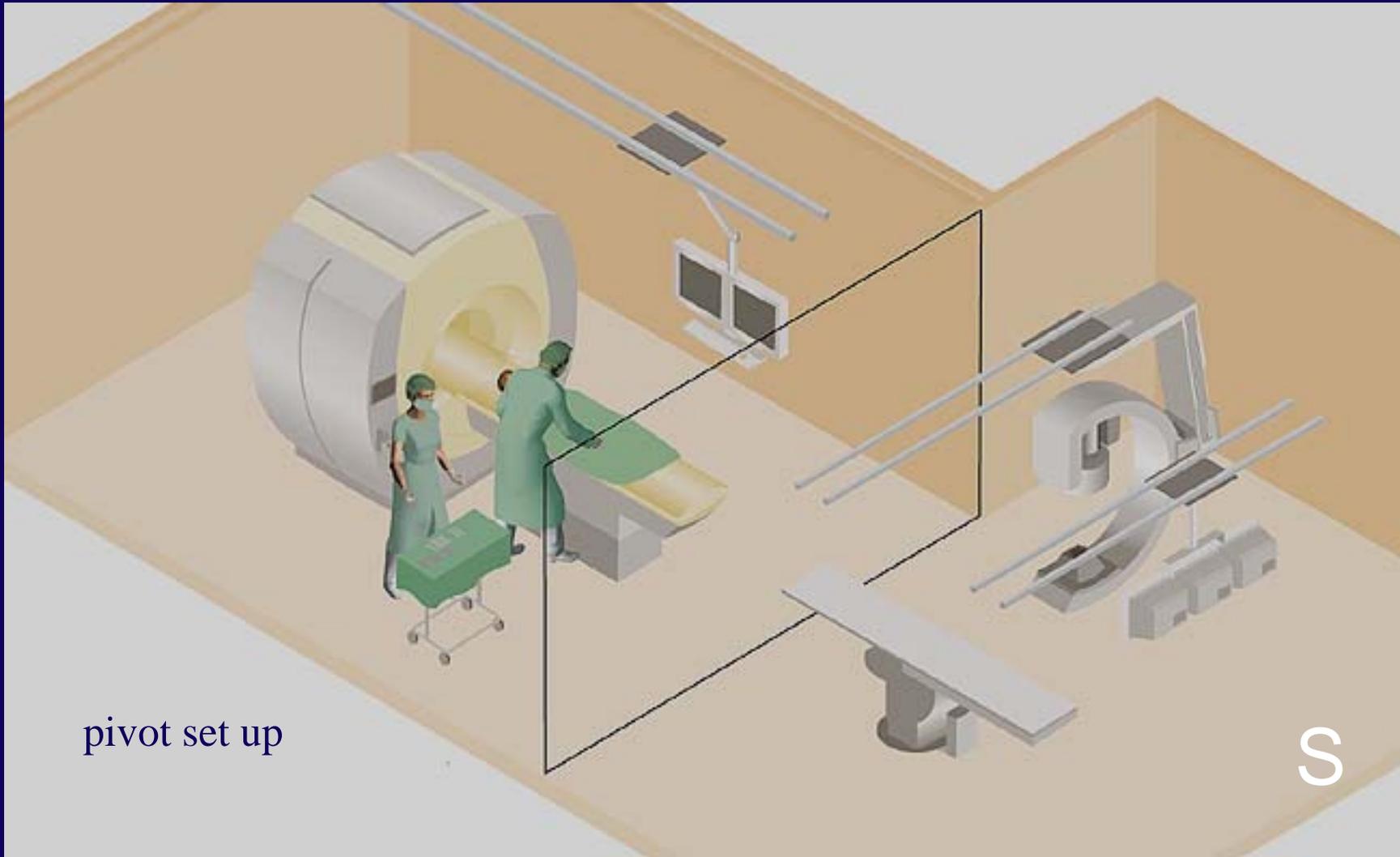
The XMR suite



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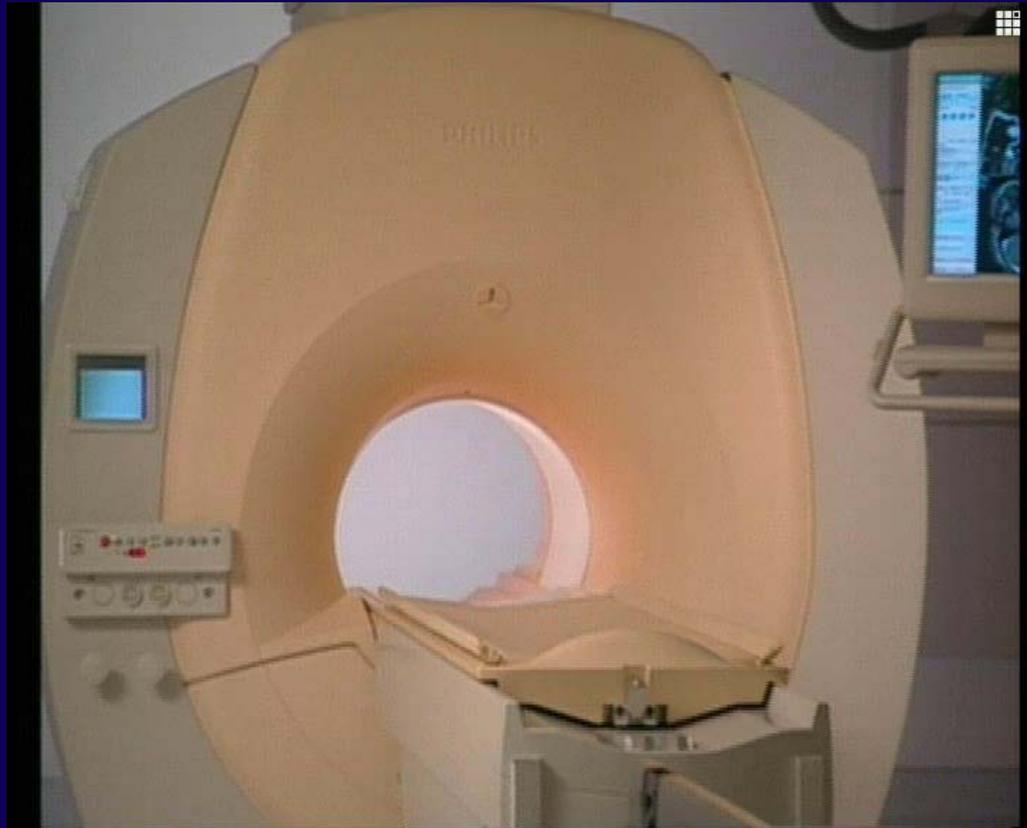
The XMR suite



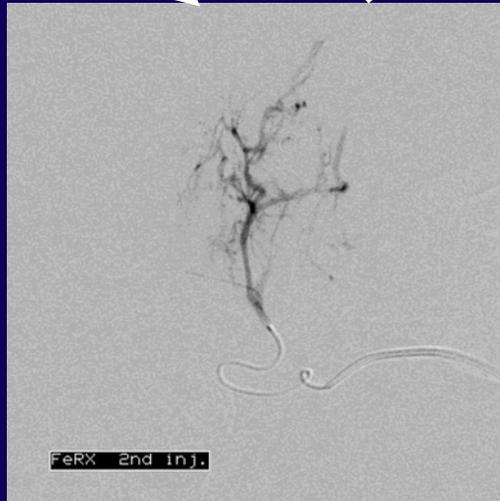
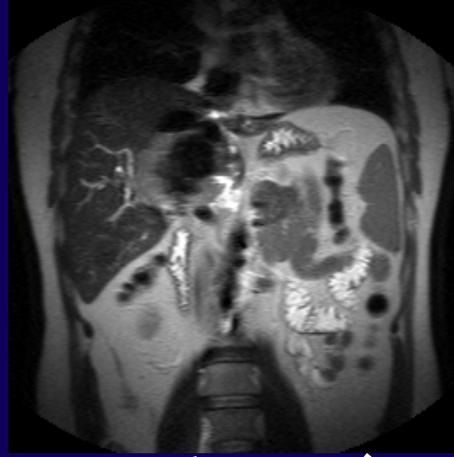
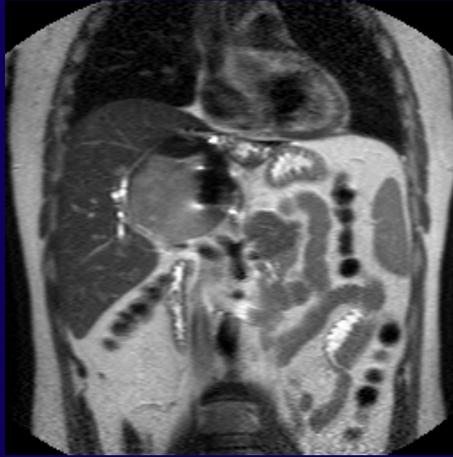
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PHILIPS

XMR: Combined Therapy



Therapy delivery: FeRx



Courtesy: UCSF Dr Mark Wilson

XMR: Intera I/T Cardiovascular with Pulsera

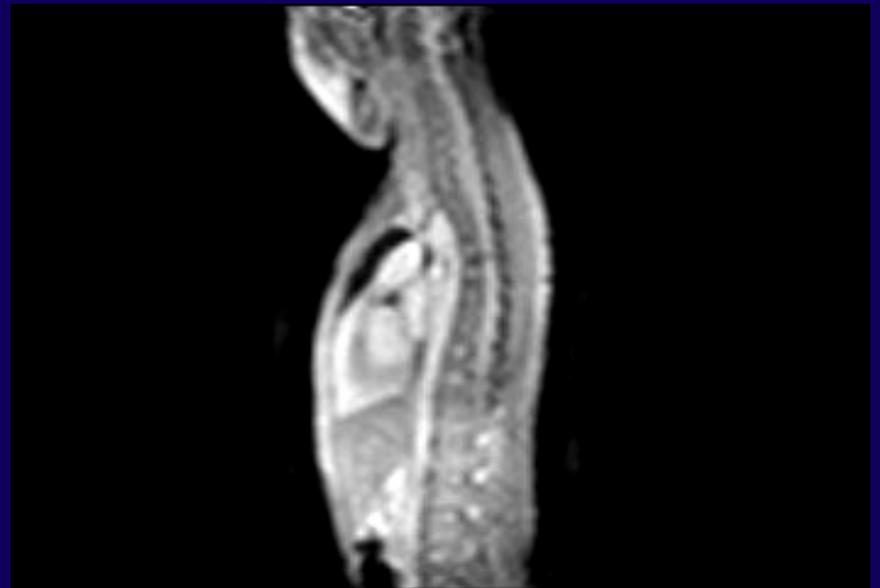
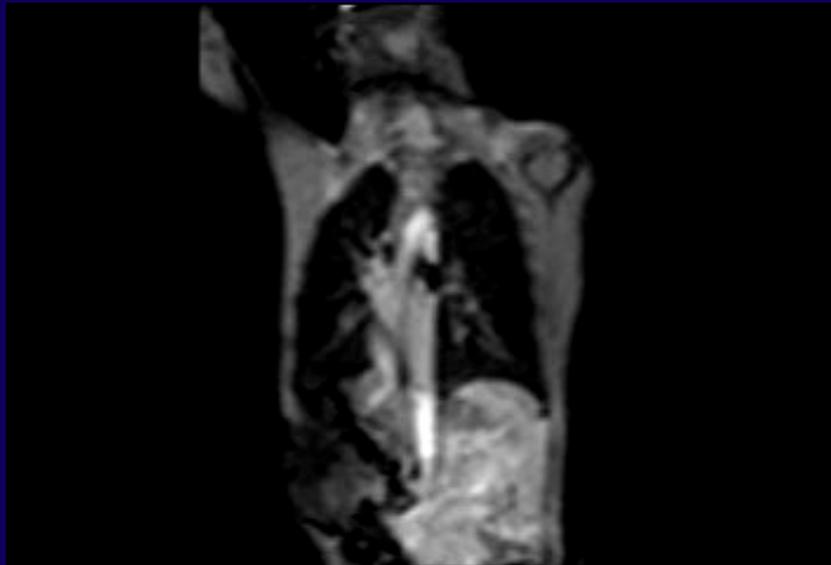


Guy's Hospital, London

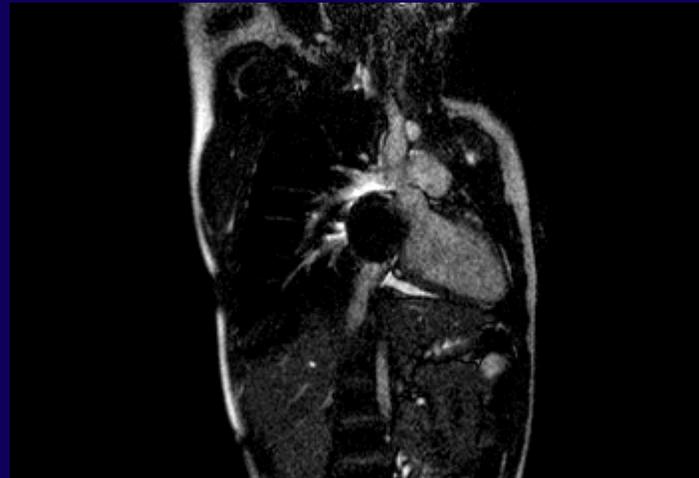
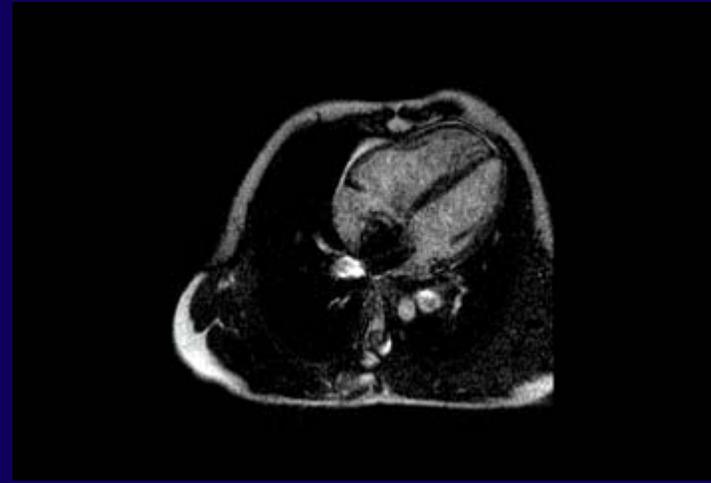
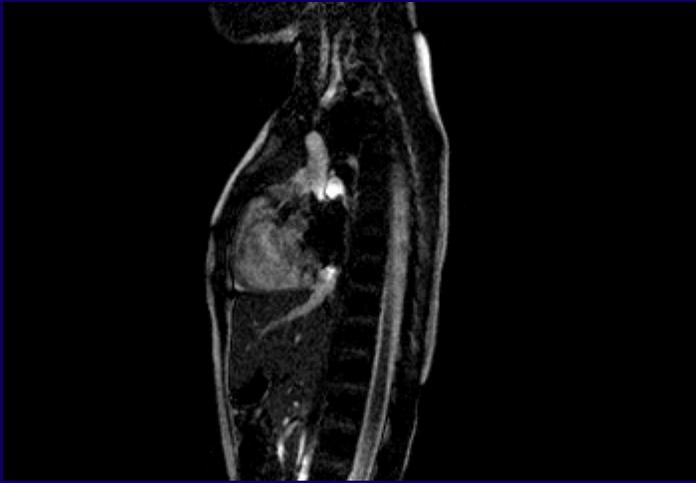
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Visualizing catheters



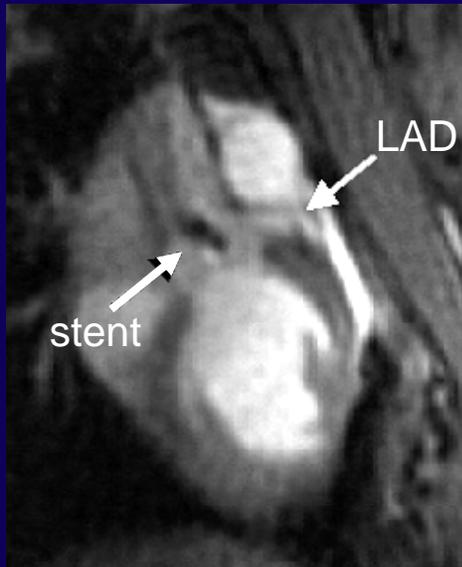
Implanted ASD closure device





MR-guided coronary artery stenting

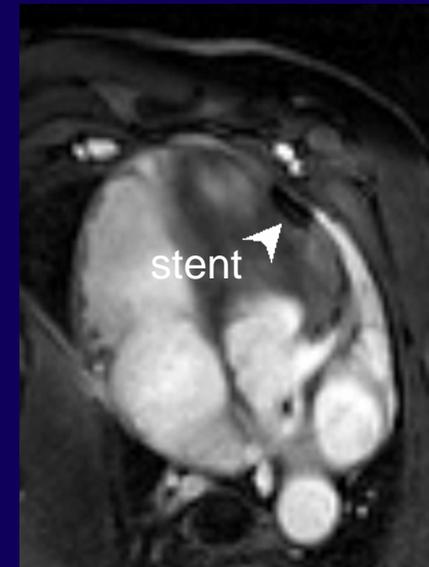
Positioned under real-time 15 fps MR-guidance



Stainless steel stent placement in the LAD



Nitinol 0.0035 inch guidewire in the LAD



LAD after MR-guided stent placement

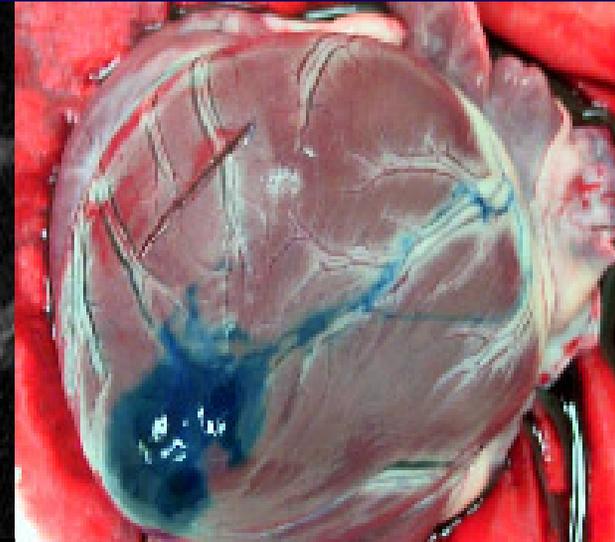
Circulation 105, 874-879 (2002)

Courtesy: RWTH University, Aachen

Molecular imaging: MR-guided delivery



Targeted drug delivery (e.g. VEGF) into myocardium



Real-time 10 fps catheter visualization

MR-guided drug delivery in apex

Excellent histological correlation

X-MR: Potential applications/costs benefits

- Neurosurgery: outcomes
- Pediatrics: dose management
- Stroke
- (Vascular) Drug delivery system
- Additional costs: approximately 20%

Multi Modality Integration / XMR

Barriers to commercialization

- Bridging the diagnosis – therapy gap: fusion of imaging modalities
- Challenges for the device industry to keep up with improved diagnostic imaging capabilities
- Matching new imaging technology with new interventional/therapeutic strategy (no such thing as just substituting one modality for another)