New Possibilities in Precision Medicine:

Initial experiences with Magnetom Vida

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Precision Medicine: Role of Imaging
Precision Medicine: Fundamental Concerns

- Therapy Relevance
- Quantitative Data
- Analysis
- Image Acquisition
- Patient

Previous and Current Work at UKT:

Make MRI fast and robust just like CT! Even a little better...

Freebreathing Compressed Sensing VIBE
Weiss et al. ISMRM 2017
Magnetom Vida brings it all together.

World’s First Installation of Magnetom Vida (12/2016)
Equipped with BioMatrix-Technology
3T, 128 channels, 60/200 XT Gradients, 55x55x50cm FOV

Speed in Workflow and Acquisition:
Auto-Align and MRI in just a short 5 minutes

- T2 HASTE – 0.50 min
- qT2 dark fluid – 1:30 min
- DWI b0/b1000 – 0.40 sec
- T1 Fl2D – 0.42 min
- T1 Fl2D – 0.38 min
Always a Problem: Neck – Inhomogeneities
Slice Adjust + Coil Shim in tiltable 20-channel-coil

Always a Problem: Neck – Diffusion
Slice Adjust + Coil Shim in tiltable 20-channel-coil

DWI: Slice Adjust + Coil Shim
Always a Problem: Neck – Diffusion
Slice Adjust + Coil Shim in tiltable 20-channel-coil

DWI: Standard Shim: Signal Loss and Distortion

Knee with Ultra Flex 18 Coil
140 KG – did not fit in regular Knee Coil

Osteoarthritis
Better Control of Respiratory Motion

6 y.o. girl – f/u nephroblastoma

Golden-angle radial sparse parallel MRI (GRASP)

Or ignore respiratory motion?
Golden-angle radial sparse parallel MRI (GRASP)
Magnetom Prisma®
One Breathhold Single Slice Short Axis

22 y.o. patient with ventricular thrombus/ Hughes-Stovin-Syndrom + M. Behcet

Magnetom Vida with Compressed Sensing
One Breathhold Whole Heart SA
DOT-Cockpit: 2 Screens – Acquisition and Postprocessing

GRASP – DOT – Engine: Bolus Detection
Easy and repeatable acquisition
Optimized Workflow for Technicians

- Automated Coil-Detection
- Fully Motorized table – Biomatrix Respiratory Sensor
- Easy to dock and maneuver.

Perfusion-Quantification with integrated Tissue 4D
Direct online Processing

Ruff et al.; ISMRM 2017  16 y.o. patient with nephroblastoma metastases
Summary

- Only if robust and repeatable, precision medicine based on imaging data is possible.

- Magnetom Vida with BioMatrix Technology enables us to acquire fast, robust and stable cutting edge MRI-data.

- We will assess primary tumors, image phenotyping and therapy response.
Summary

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- Magnetom Vida with BioMatrix Technology enables us to acquire fast, robust and stable cutting edge MRI-data.

- We will assess primary tumors, image phenotyping and therapy response.

Thank you!

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