The Affidea MR Excellence Program: A comprehensive MRI optimization and standardization project

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Background / Purpose

Magnetic Resonance Imaging (MRI) is not only one of the **most complex** parts of the diagnostic chain, it is also one of the **most expensive**. Obtaining excellent anatomical and functional images is time consuming and requires high levels of technical expertise. Although vendors are attempting to codify workflows, there are numerous factors that lead to increasing **heterogeneity** in the way images are produced and the time it takes to produce them.

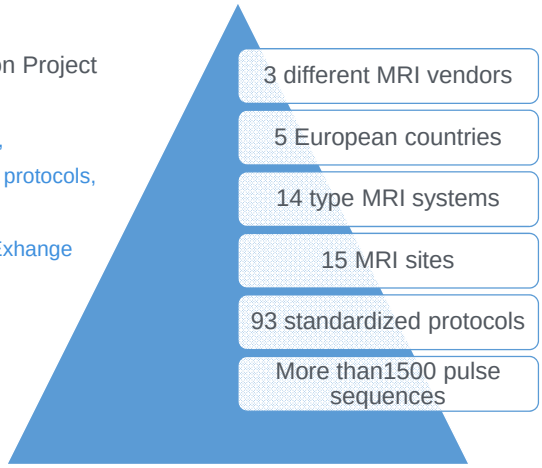
The **purpose** of the current exhibit was to harmonize and optimize quality and patient experience across 15 MRI centers in 5 European countries

Materials and Methods

MRI Protocol Unification Project

MRI Protocol Standardization Project

- 8 standardization workshops,
- Consensus on standardized protocols,
- Site visits,
- Remote access to Protocol Exhange Platform.



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Materials and Methods

Core sequences:
Sequences which need to be performed for diagnostic image quality

Recommended sequences:
Sequences which are recommended to perform on top of core sequences, and enhancing diagnostic confidence in case technology and patient volume allows

Optional sequences
Sequences that are optional to perform, which enable advanced post processing and can be either separately reimbursed or can give competitive advantage a medical differentiator

Conditional sequences:
Sequences which need to be performed in case if certain condition, in which these are core

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Materials and Methods

How?

Blind assessment of Image Quality (IQ) using a 5-point grading scale
1: Poor IQ: High Noise, Severe Artifacts, Low Contrast
2: Moderate IQ: Moderate Noise, Moderate Artifacts, Adequate Contrast
3: Good IQ: Low Noise, Minor Artifacts, Adequate Contrast
4: Very Good IQ: Low Noise, Minor Artifacts, Superb Contrast
5: Excellent IQ: No Noise, No Artifacts, Superb Contrast

5 most common site exams
Approx. 4 core sequences per exam
- 20 sequences (before optimization)
- 20 sequences (during optimization)
- 20 sequences (after optimization)

Who?

2 Site Radiologists

Interobserver variability will be assessed by means of ICC statistics

Why?

To decide which sequences should be used on each site in terms of sequence parameters, based on the Sequence Performance Index

SPI = (IQ*NoSl)/(ST*Res)

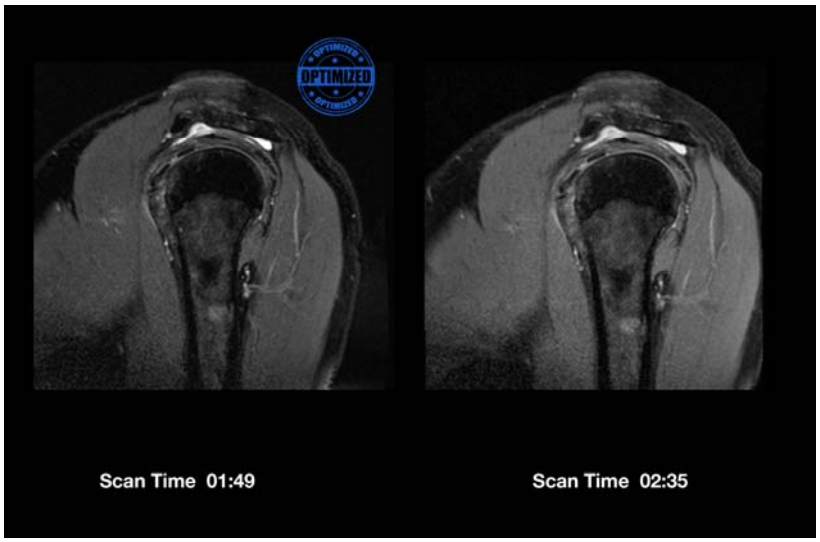
IQ: Input from Radiologist
NoSl: Number of slices
ST: Sequence Scan Time
RES: Sequence Voxel size

Results

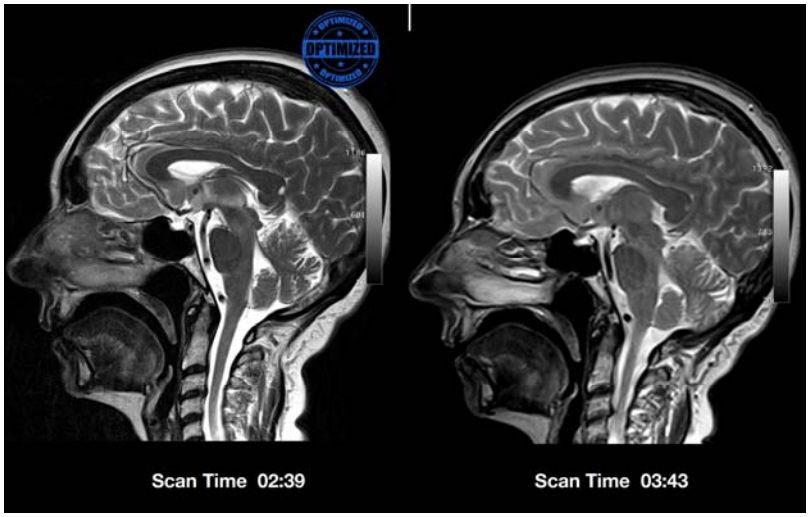
Results from all five countries indicated significant improvement both in terms of quality and patient experience. More specifically, in Lithuania the mean IQ scores were 2.87 (before the visit), 3.28 (during the visit) and 2.91 (after the visit), while the corresponding mean SPI's were 1.44, 1.83 and 1.38, respectively.

There was a 6.8% reduction in examination time after the visit, a 7.3% reduction in the non-scanning time, a 10.9% increase in the number of exams, a 1.3% reduction in utilization rate, a 7.3% improvement in the compliance to standardized protocol and a 17.2% improvement in the deviation of the standardized protocol.

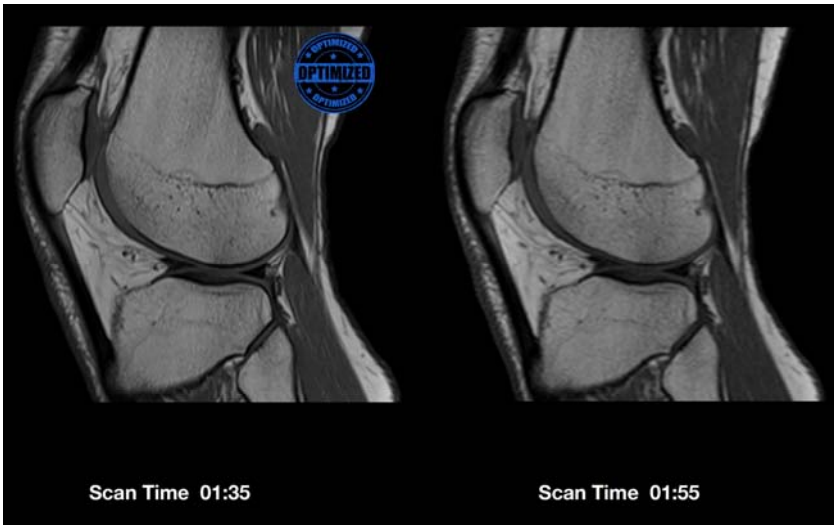
Results



Results



Results



Conclusions

MREP has been successfully deployed in very heterogeneous environments in terms of MRI culture, equipment and level of expertise of the local staff.

It proved a challenging process that demands active engagement of a very diverse workgroup including Radiologists, Radiographers, Clinical Scientists, Software Engineers and active support of the Affidea local management.