Sustainable Compet

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EUROPE

Forum 3
The future is now – AI as a driver of sustainable healthcare?

Wednesday, 3 October 2018 | 14.45-17.15 | Kursaal C

Co-organised by COCIR and EHFG

With the kind support of Siemens Healthineers, Philips and GE Healthcare

Panel 1: The added value of AI in prevention and treatment

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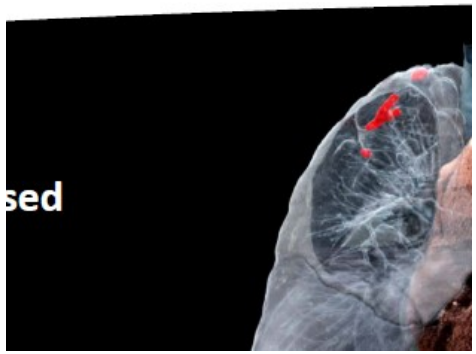
Industry Perspective



- What do we mean by AI in Health and Care?
  - CADe, QIT, CDS, CADx*
- 7 Focus areas to play successfully
  - **Build awareness** with Innovators/early adaptors/KOLs
  - Support and **enable access** to massive amount of Imaging Data
  - Build a **sustainable G2M** Modell by Provisioning AI-plattforms integrated into clinicians daily routine workflow vs. stand alone applications
  - **Drive adoption** by impact driven (COF*-Perspective) use cases
  - Support deployment by **robust Legal framework**
  - Consider latest **Regulatory Framework**
  - Apply **Ethical Framework**
- Why is it important?

* CADe= Computer Aided Detection, QIT=Quantitative Imaging Tools, CDS=Clinical Decision Support. CADx= Computer Aided Diagnosis,
* COF: Clinical – Operational Financial

Why is it important?

Increasing workload

Growth of **CT/MR scanning 10-12%** but **radiologist workforce only 3%** per year for the last ten years[1]

Decreasing turnaround time

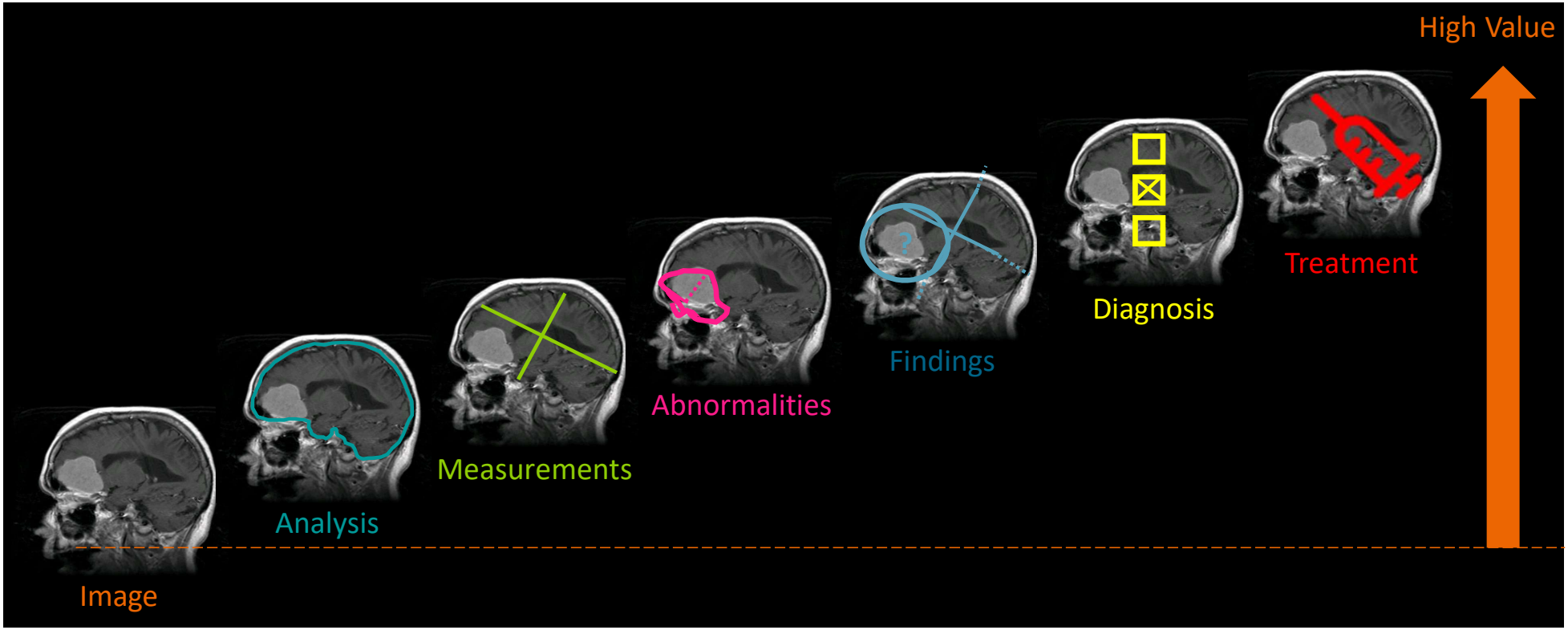
Halving interpretation time of radiologists leads to an **increase in interpretation error rate** by **16.6 %point**[2]

Diagnostic precision through quantification

Cognitive factors (perception, failed heuristics) **contribute to the diagnostic error** in **74%** of cases[3]

[1] The Royal College of Radiologists
[2] Faster Reporting Speed and Interpretation Errors: Conjecture, Evidence, and Malpractice Implications, Journal of the American College of Radiology, Volume 12, Issue 9, September 2015, Pages 894-896
[3] Cognitive and System Factors Contributing to Diagnostic Errors in Radiology American Journal of Roentgenology, 201, September 2013

AI is key enabler for Digitalization



AI adds value in every workflow step

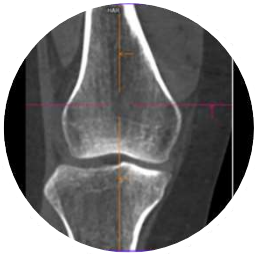
AI powered
Acquisition & Examination

AI powered
Processing & Interpretation

AI powered
Guidance & Workflow

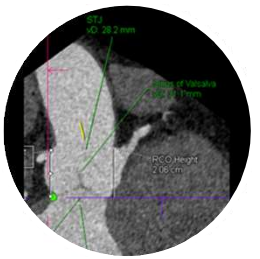
Accurate patient positioning

Spine and rib unfolding

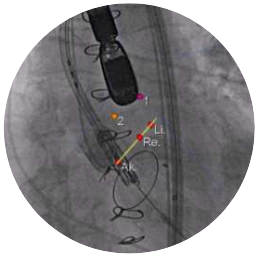


ALPHA Anatomical Ranges

Anatomy Visualiser

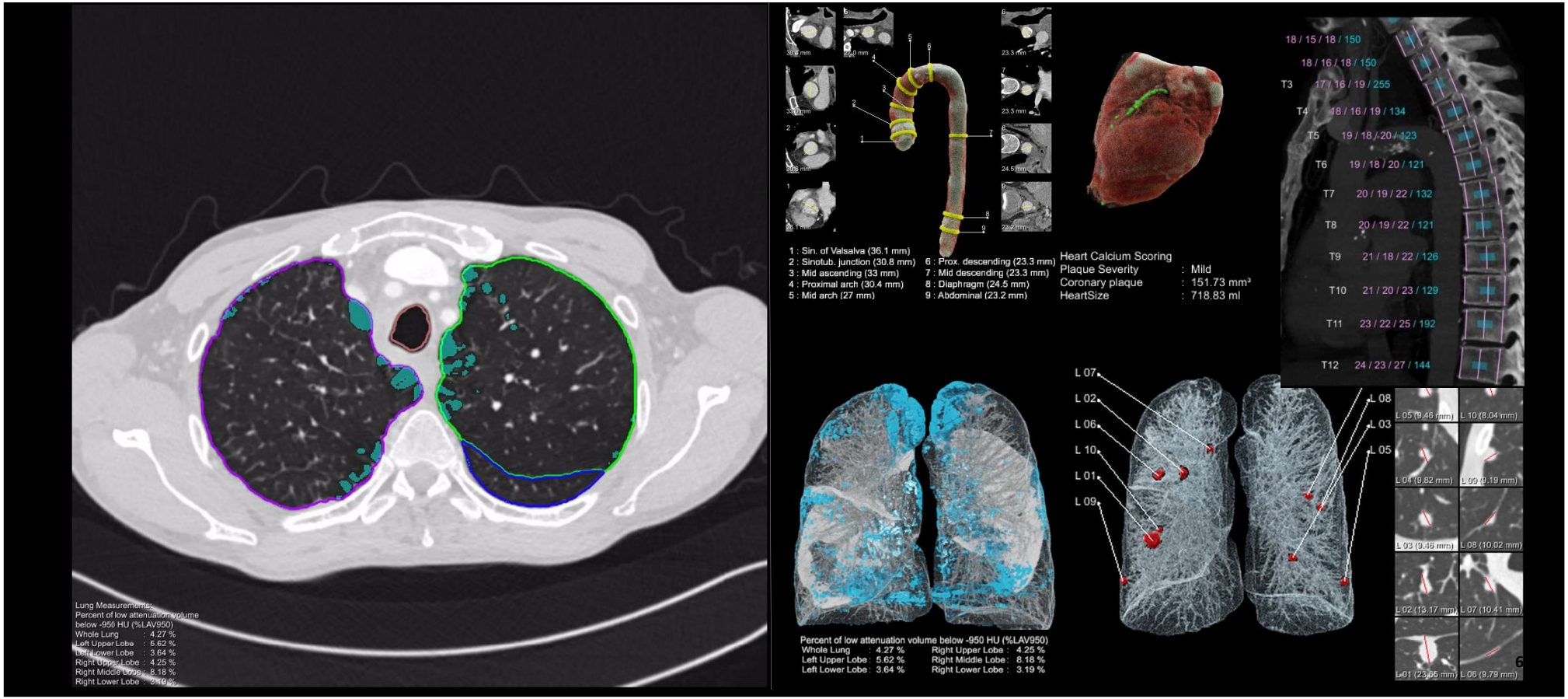


Cardiovascular TAVI-Planning

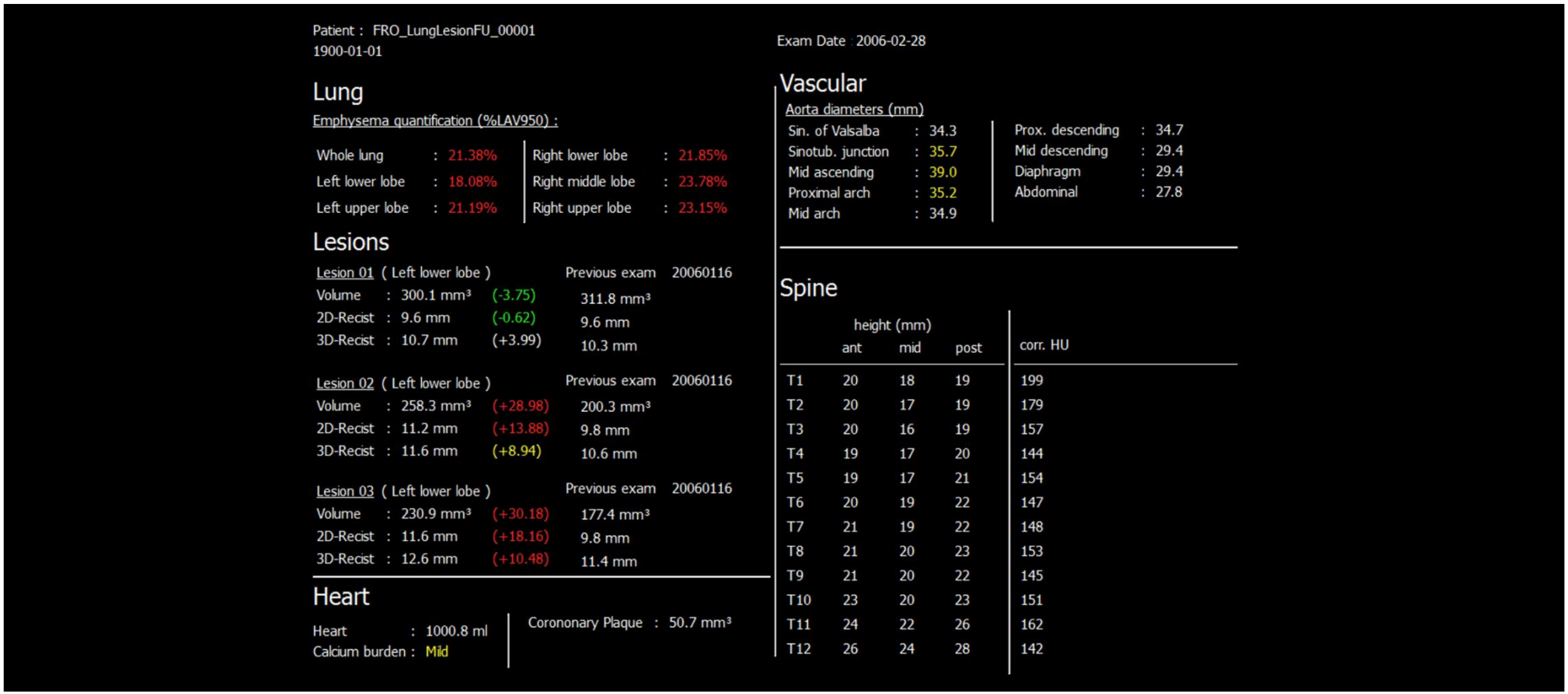


True fusion

Use Case: AI in Chest Imaging



Use Case: AI in Chest Imaging



Patient : FRO_LungLesionFU_00001
1900-01-01

Exam Date : 2006-02-28

Lung

Emphysema quantification (%LAV950) :

Whole lung	: 21.38%	Right lower lobe	: 21.85%
Left lower lobe	: 18.08%	Right middle lobe	: 23.78%
Left upper lobe	: 21.19%	Right upper lobe	: 23.15%

Lesions

Lesion 01 (Left lower lobe)		Previous exam	20060116
Volume	: 300.1 mm³ (-3.75)		311.8 mm³
2D-Recist	: 9.6 mm (-0.62)		9.6 mm
3D-Recist	: 10.7 mm (+3.99)		10.3 mm
Lesion 02 (Left lower lobe)		Previous exam	20060116
Volume	: 258.3 mm³ (+28.98)		200.3 mm³
2D-Recist	: 11.2 mm (+13.88)		9.8 mm
3D-Recist	: 11.6 mm (+8.94)		10.6 mm
Lesion 03 (Left lower lobe)		Previous exam	20060116
Volume	: 230.9 mm³ (+30.18)		177.4 mm³
2D-Recist	: 11.6 mm (+18.16)		9.8 mm
3D-Recist	: 12.6 mm (+10.48)		11.4 mm

Heart

Heart	: 1000.8 ml
Calcium burden	: Mild
Coronary Plaque	: 50.7 mm³

Vascular

Aorta diameters (mm)

Sin. of Valsalba	: 34.3	Prox. descending	: 34.7
Sinotub. junction	: 35.7	Mid descending	: 29.4
Mid ascending	: 39.0	Diaphragm	: 29.4
Proximal arch	: 35.2	Abdominal	: 27.8
Mid arch	: 34.9		

Spine

	height (mm)			
	ant	mid	post	corr. HU
T1	20	18	19	199
T2	20	17	19	179
T3	20	16	19	157
T4	19	17	20	144
T5	19	17	21	154
T6	20	19	22	147
T7	21	19	22	148
T8	21	20	23	153
T9	21	20	22	145
T10	23	20	23	151
T11	24	22	26	162
T12	26	24	28	142

Recommendations to Member States

1. **Create Awareness with Innovators/KOLs**

   AI technologies present huge opportunities to improve quality of people‘s live and transform healthcare

2. **Enable publicly available, disease driven, national, high quality Data sets and related framework/standards of using it**

   The more data the algorithm is trained on the better it gets

3. **Invest in building a robust, powerful, scalable and highly secure ata infrastructure/Data Center**

   e.g. Super Computer with 12 PetaFLOPS ($12*10^{15}$) of computing power

4. **Set-Up and Drive education of Data Eng.-/Data Scientists**

   Building impactful AI solutions need skilled DE/DS - creating new jobs in EU