



HEIDELBERG
UNIVERSITY
HOSPITAL

EUROPE'S BEATING CANCER PLAN
LET'S STRIVE FOR MORE

#EUCancerPlan

DIR Diagnostic
Interventional
Radiology

Lung Cancer Screening Programmes across Europe

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Conflict of interest disclosure

X I have the following real or perceived conflicts of interest that relate to this presentation:

Affiliation / Financial interest	Commercial Company
Grants/research support:	Siemens, Philips, Bayer
Honoraria or consultation fees:	Siemens, Philips, Boehringer Ingelheim, MSD, Astra Zeneca
Participation in a company sponsored bureau:	none
Stock shareholder:	none
Spouse / partner:	
Other support / potential conflict of interest:	none

ESR/ERS white paper on lung cancer screening

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ERS OFFICIAL DOCUMENTS
ESR/ERS STATEMENT

ESR/ERS
EUROPEAN SOCIETY
OF RADIOLOGY



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ESR/ERS statement paper on lung cancer screening

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ERS EUROPEAN
RESPIRATORY
SOCIETY



LCS: Evidence and Algorithms established

- ✓ Reduction of lung cancer mortality
- ✓ esp. in women
- ✓ Inclusion criteria 55-75 years
- ✓ Low dose CT
- ✓ 3D evaluation of nodules
- ✓ Algorithms for management (LungRads)

=> Ready for implementation



Nationwide LCS Programme: Croatia

- ✓ Official launch in Zagreb on January-14, 2020
- ✓ 16 sites throughout Croatia, central database
- ✓ Interrupted after earthquake on March-22
- ✓ And COVID-19 
- ✓ Started on October-1, 2020

„Lung cancer does not kill if detected early“

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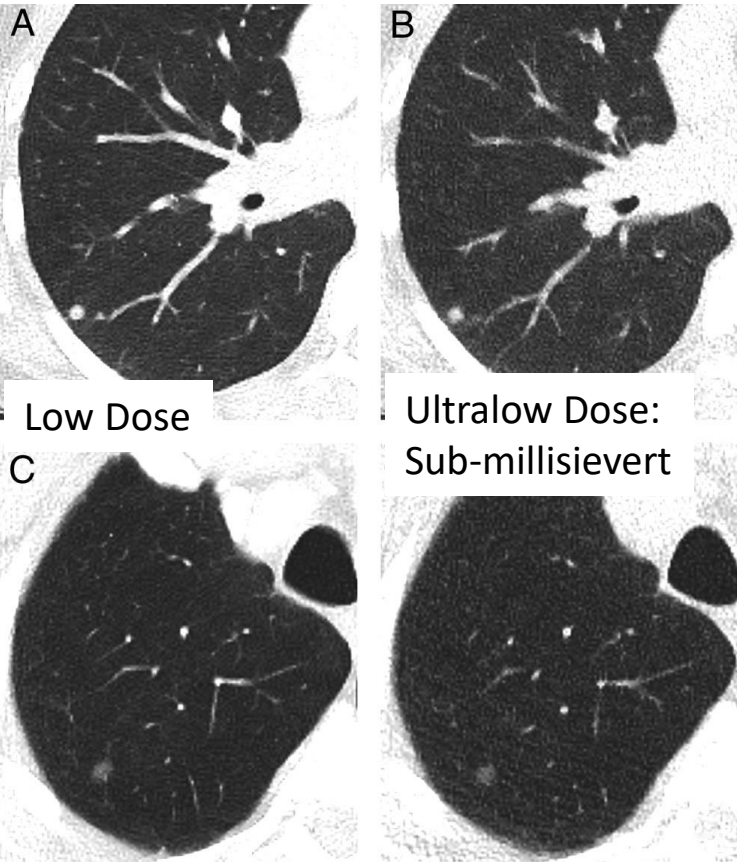
Innovations

increase impact

overcome bottlenecks

tackle inequalities

Ultralow dose CT (Submillisievert)

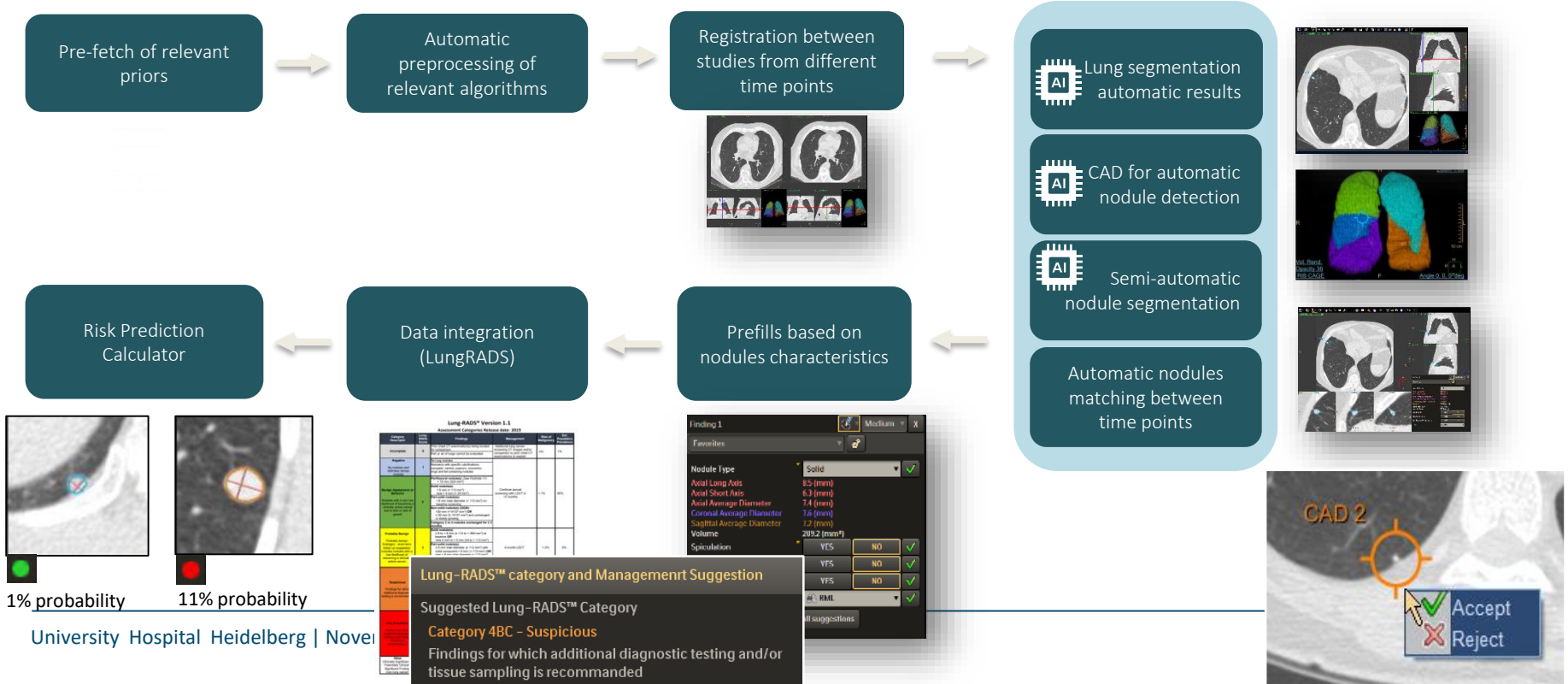


- Dose negligible
- No long-term adverse effects

	<5 mm	5 - 7 mm	>7 mm
Number of nodules	334	70	21
Nodule type			
solid, <i>n</i>	179 (54%)	56 (80%)	19 (90%)
calcified, <i>n</i>	97 (29%)	3 (4%)	0 (0%)
subsolid, <i>n</i>	58 (17%)	11 (16%)	2 (10%)
True positive, <i>n</i>	299	68	21
False positive, <i>n</i>	35	2	0
Sensitivity (95% CI)	89.5% (85.7 - 92.6%)	97.1% (90.0 - 99.6%)	100% (83.9 - 100%)

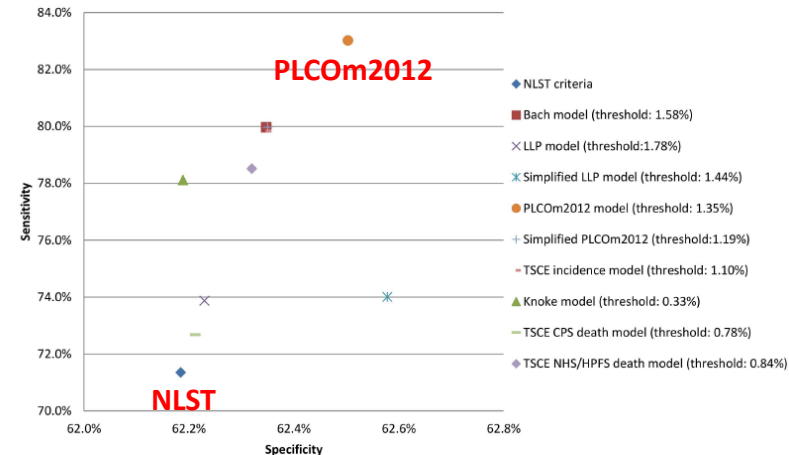
Artificial Intelligence: Images

Nodule detection and characterization, AI as a second reader



Artificial Intelligence: Data-driven Science

- Risk models
- Risk prediction calculator **nodule** and **individual**
- Individualized screening period and intervals
- Less overdagnosis
- Register, QA
- liquid and volatile biomarkers



Accessibility & Affordability

- Outreach
- Clear language and terminology
- Minimize stigma
- Shared decision making
- Benefits and harms
- Cost effectiveness



Is lung cancer screening right for me?
A Decisionmaking Tool for You and Your Health Care Professional

If you have smoked for many years, you may want to think about lung cancer screening (testing) with low-dose computed tomography (LDCT). Before making a decision, you should think about the possible benefits and harms of lung cancer screening.

What are the possible benefits and harms of lung cancer screening with LDCT?

BENEFIT: Greater chance of not dying from lung cancer.

- If 1,000 people are not screened for lung cancer with LDCT, **21 will die from lung cancer.**
- If 1,000 people are screened once a year with LDCT for 3 years, **18 will die from lung cancer.**
- This means that with LDCT screening, **3 fewer people will die from lung cancer.**

BENEFIT: Greater chance of not dying from any cause (not just lung cancer).

- If 1,000 people are not screened for lung cancer with LDCT, **75 will die from any cause.**
- If 1,000 people are screened once a year with LDCT for 3 years, **70 will die from any cause.**
- This means that with LDCT screening, **5 fewer people will die from any cause.**

HARM: False alarms and unnecessary additional testing.

A false alarm happens when a person has a positive screening test but does not actually have lung cancer.

- If 1,000 people are screened every year for 3 years, about **358 will have a false alarm.**
- Of these 358 people with a false alarm, **18 will have an invasive procedure** such as a biopsy (a tiny piece of lung tissue is removed to test for cancer).
- Of these 18 people, **3 will have a major complication** as a result of the procedure, such as bleeding in the lung, a collapsed lung, or an infection.

If you have a positive screening test, but your followup imaging tests and biopsy do not show cancer, you could still get lung cancer in the future. So it is important for you and your health care professional to discuss lung cancer screening every year.

HARM: Radiation Exposure.

This includes radiation from screening plus radiation from additional testing. High doses (amounts) of radiation increase a person's chance of developing cancer.

HARM: Overdiagnosis.

Screening may find lung cancer that would not have harmed the person in his or her lifetime.

What are the possible benefits and harms of lung cancer screening?

Out of 1,000 people screened with LDCT for lung cancer:

- **3 lung cancer deaths will be prevented.**
- **18 people will die of lung cancer.**
- **358 people will get a "false alarm."**
- **18 of the people who get a "false alarm" will have an invasive procedure (like a biopsy).**
- **3 of the 18 people who have an invasive procedure will have a major complication (like bleeding, swelling, a lung, collapsed lung).**

Out of 1,000 people not screened with LDCT for lung cancer:

- **21 people will die of lung cancer.**

* For people screened once a year for 3 years and followed for an average of 6.5 years.
The possible benefits and harms from lung cancer screening represent the "average" effect and may not apply to all healthy current and former heavy smokers.

Finding other things that are not lung cancer:
For example, screening can find heart disease or thickened tissue in the lungs from scarring. Physicians do not know the possible benefits or harms of finding other things about your health through lung cancer screening.

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Downstream Workflow and Treatment Options

- **Integration** of screening and healthcare system (IT)
- **Multidisciplinary** nodule and tumor boards
- Re-evaluation of **treatment** options for stage 1 lung cancer:
lung sparing surgery, stereotactic radiation, ablation
- **Comorbidities**, incidentals

Lung Cancer Screening

- **Accomplished:** reduction of lung cancer mortality
- **Unmet need:** longer survival with lung cancer
- **Expected:** Quantum leap in technology: ultra low dose, data, AI
- **Required:** awareness and accessibility
- Data and IT integration

