

# Odense University Hospital

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## Time gain of online AI-assisted delineation

for online MR-guided adaptive radiotherapy of prostate cancer

Maximilian Lukas Konrad<sup>1</sup>, Carsten Brink<sup>1</sup>, Ander Smedegaard Bertelsen<sup>1</sup>, Ebbe Laugaard Lorenzen<sup>1</sup>, Bahar Celik<sup>1</sup>,  
Christina Junker Nyborg<sup>2</sup>, Lars Dysager<sup>2</sup>, Tine Schytte<sup>2</sup>, Uffe Bernchou<sup>1</sup>

1: Laboratory of Radiation Physics, Department of Oncology, Odense University Hospital, Odense, Denmark

2: Department of Oncology, Odense University Hospital, Odense, Denmark

# The general problem

**The general problem in radiotherapy:**  
The patient is alive and breathing – and we would very much like to keep it that way.

# The promising solution

**The general problem in radiotherapy:**  
The patient is alive and breathing – and we would very much like to keep it that way.



**Our Solution:**  
1.5T MR-Linac



Our wonderful team of  
clinicians, technicians and  
researchers

# The new problem

But...

Online adaptive radiotherapy has its price:



- The MR-Linac is staffed with **min. 4 clinicians** at any given point
- We need to delineate **every** single fraction
- Delineations need to happen **fast** and have **high quality**, while the patient is on the treatment couch

# The new problem

**The problem:**

We can't sustain the amount of resources currently required at the MR-Linac\*.

\*this will become even worse with a second MR-Linac at nyt OUH.

# The promising solution

## The problem:

We can't sustain the amount of resources currently required at the MR-Linac\*.

## One solution:

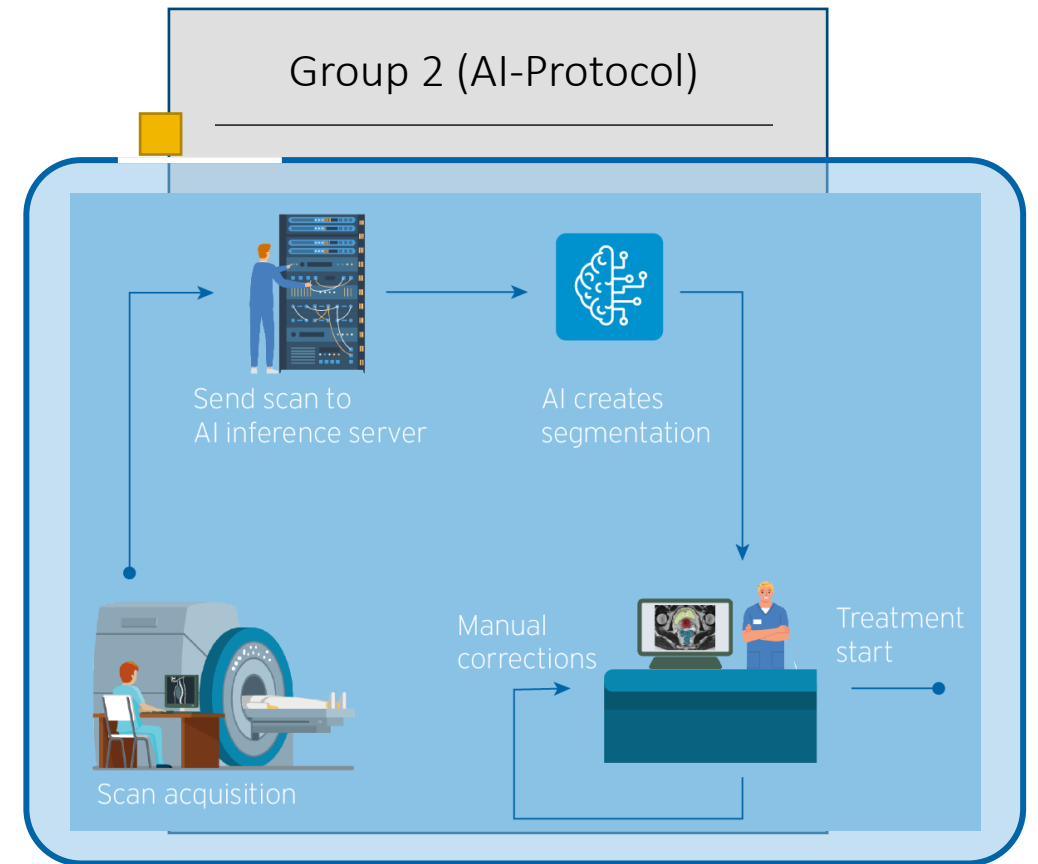
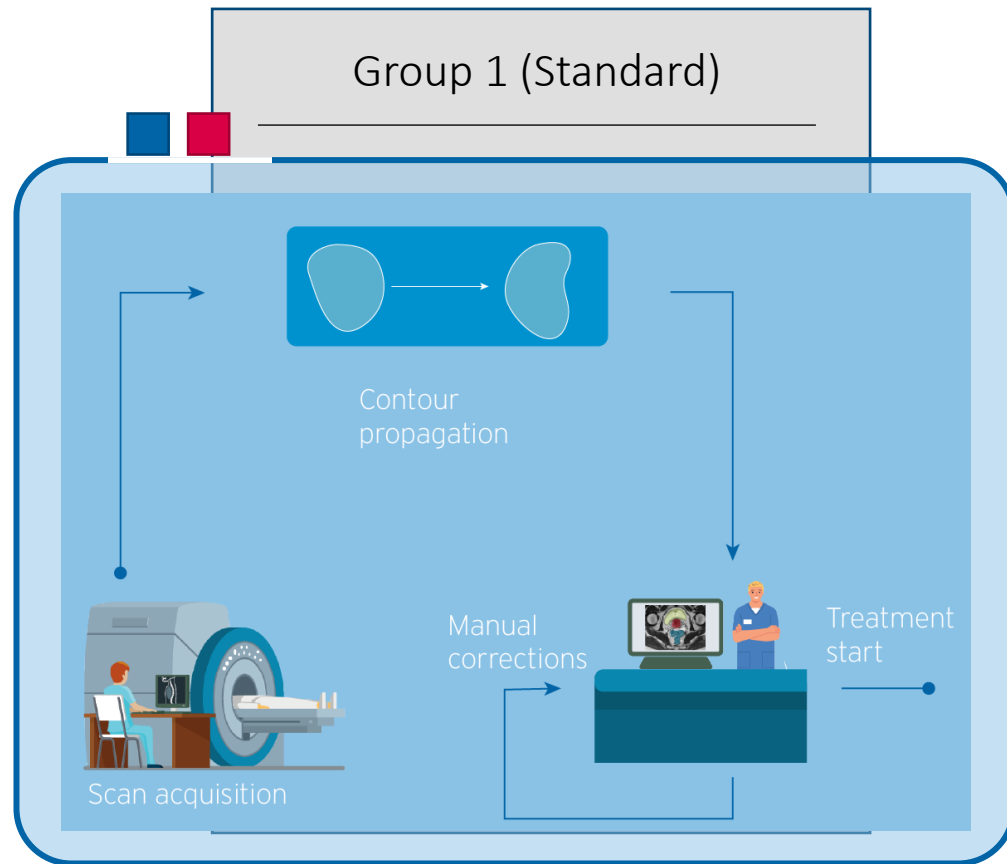
Using AI delineation tools at the MR-Linac

Our wonderful team of clinicians, technicians and researchers again



\*this will become even worse with a second MR-Linac at nyt OUH.

# Patient Cohort

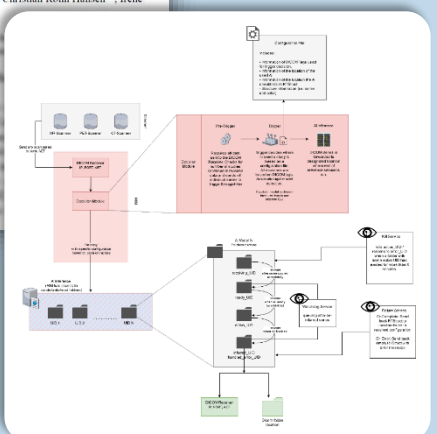


# AI Inference Service and Model

XXth International Conference on the use of Computers in Radiation therapy 8 - 11 July 2024, Lyon, France

**Implementing a simple, dynamic and controllable AI delineation tool in clinical settings**

Nis Sarup<sup>1</sup>, Maximilian Lukas Konrad<sup>1</sup>, Marie Louise Madsen Lange Sevdal<sup>1</sup>, Simon Long Krogh<sup>1</sup>, Christian Romm Hansen<sup>2</sup>, Irene Hazell<sup>1</sup>, Ebbe Laugaard Lorenzen<sup>1</sup>, Carsten Brink<sup>1</sup>



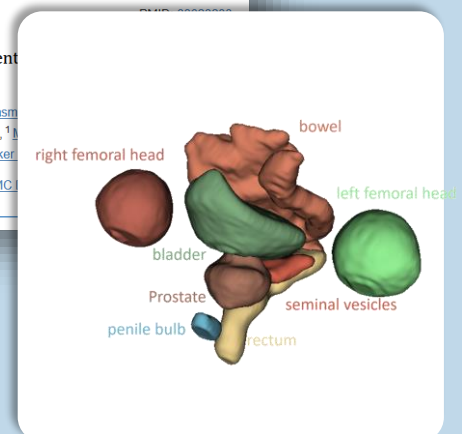
Submitted to ICCR 2024  
Code is available open source  
DOI: [sciencesconf.org/iccr2024:526006](https://sciencesconf.org/iccr2024:526006)

frontiers in Oncology

Front Oncol. 2023; 13: 1285725. Published online 2023 Nov 3. doi: [10.3389/fonc.2023.1285725](https://doi.org/10.3389/fonc.2023.1285725) PMID: PMC10654998

**An open-source nnU-net algorithm for automatic segmentation of male pelvis for adaptive radiotherapy**

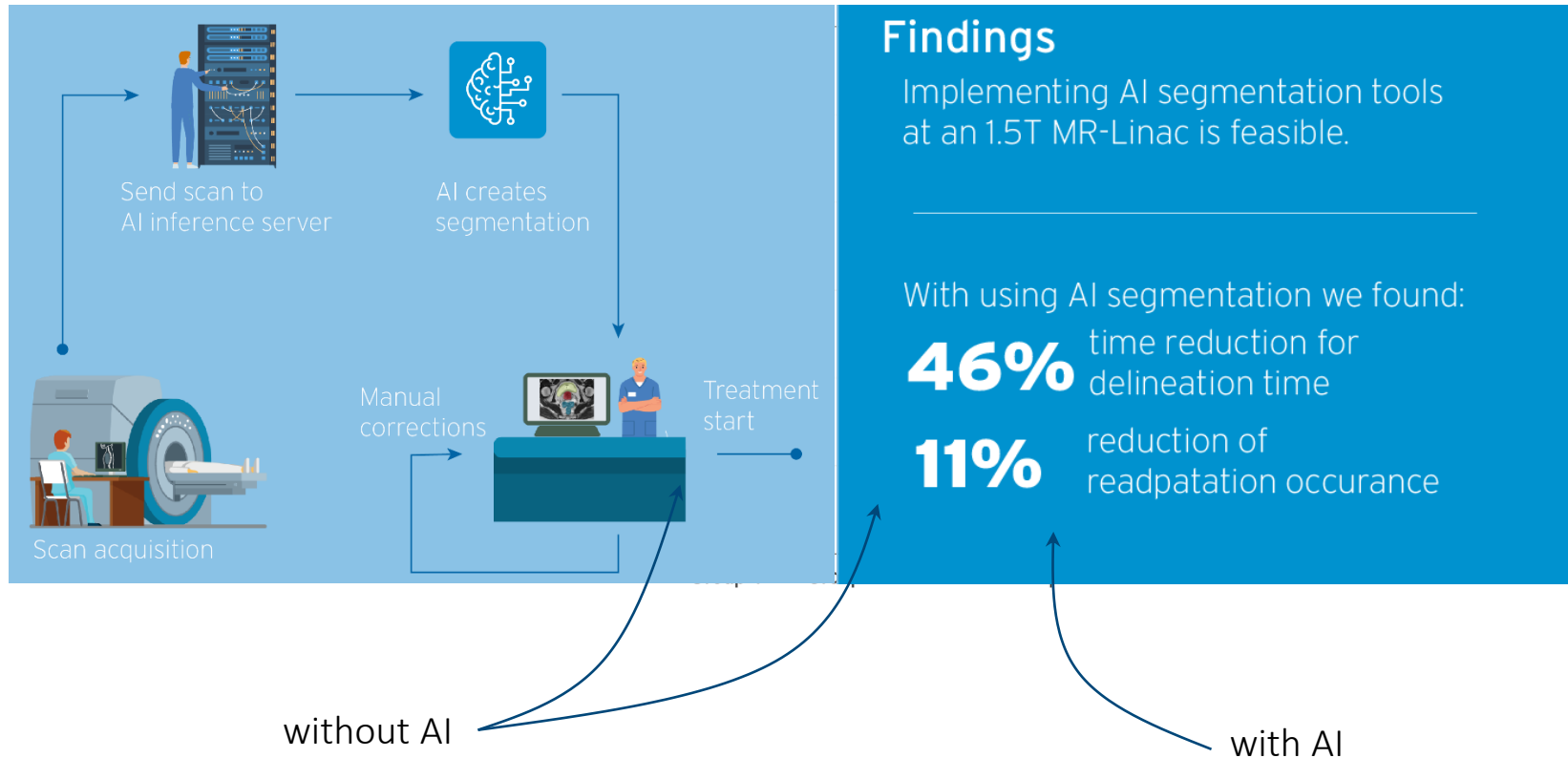
Ebbe Laugaard Lorenzen<sup>1,2,\*</sup>, Bahar Celik<sup>1</sup>, Nis Sarup<sup>1</sup>, Lars Dysager<sup>3</sup>, Rasmus Anders Smedegaard Bertelsen<sup>1</sup>, Uffe Bernchou<sup>1,2</sup>, Soren Nielsen Agergaard<sup>1</sup>, Carsten Brink<sup>1,2,\*</sup>, Faisal Mahmood<sup>1,2</sup>, Tine Schytte<sup>2,3</sup> and Christina Junker



Submitted to FrontOncol 2023  
Model is available open source  
DOI: [10.3389/fonc.2023.1285725](https://doi.org/10.3389/fonc.2023.1285725)



# AI reduces delineation time



Conclusion

# AI supports our clinicians greatly

AI almost halves delineation time



AI reduces unexpected delays



Clinicians appreciate the AI



More research into clinician-AI interaction necessary



Want to know more? Read our pre-print:  
<https://dx.doi.org/10.2139/ssrn.4883232>

## Feasibility and Timegain of Implementing Ai-Assisted Delineation Tools in Daily Mri-Guided Adaptive Prostate Cancer Radiotherapy on a 1.5t Mri-Linac System: A Sequential Crossover Study

11 Pages • Posted: 31 Jul 2024

or get in touch with us

Maximilian Lukas Konrad, [Maximilian.Lukas.Konrad@rsyd.dk](mailto:Maximilian.Lukas.Konrad@rsyd.dk)

Uffe Bernchou, [Uffe.Bernchou@rsyd.dk](mailto:Uffe.Bernchou@rsyd.dk)



This project is only possible thanks to our amazing clinicians, technicians and researchers

# Thank you for your attention