

DANSKE KRÆFTFORSKNINGS DAGE 2025

Adaptiv Strålebehandling

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Afd. for kræftbehandling

Københavns Universitetshospital Herlev og Gentofte

#DKD2025

#SamarbejdeOmKræft

1

Slido

#131525

Hvad kan adaptiv strålebehandling?

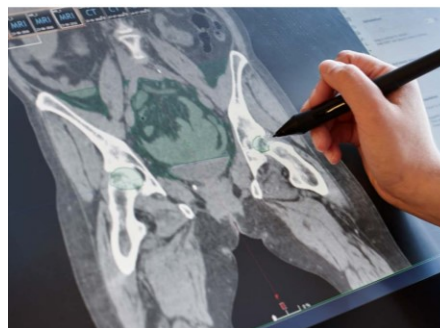
Mindske bivirkninger

Højrisiko anatomisk placering

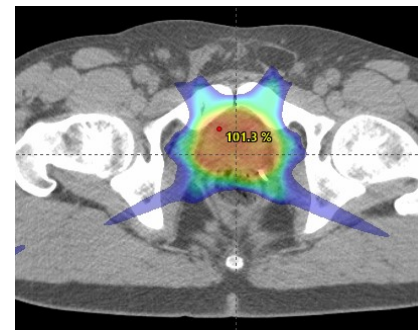
Optimere behandlingsforløb



Terapiskanning



Indtegning



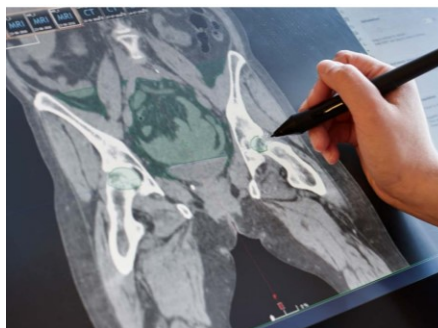
Dosisplan



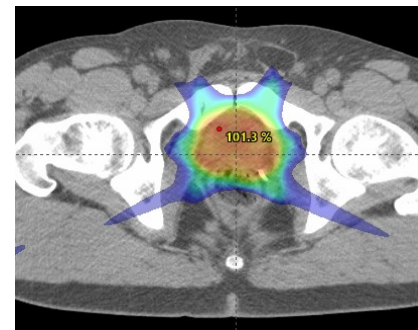
Behandling



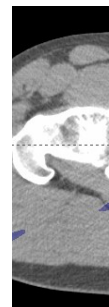
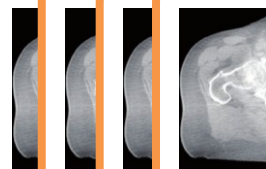
Terapiskanning



Indtegning



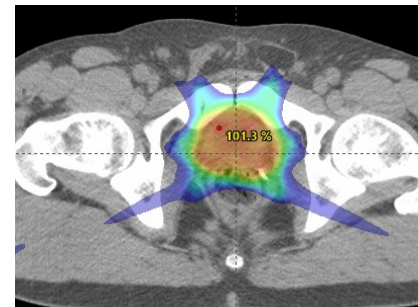
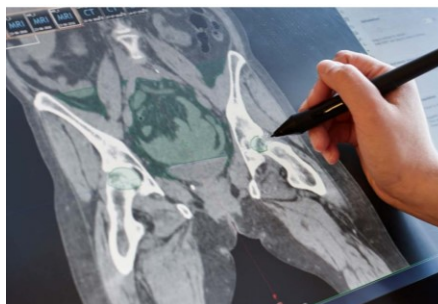
Dosisplan



Ny

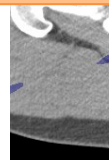


Behandling ny plan



Hvorfor er der brug for adaptiv strålebehandling?

Omskanning



Ny



Behandling

#DKD2025

#SamarbejdeOmKræft

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#131525

Tyndtarme



Blære



Endetarm

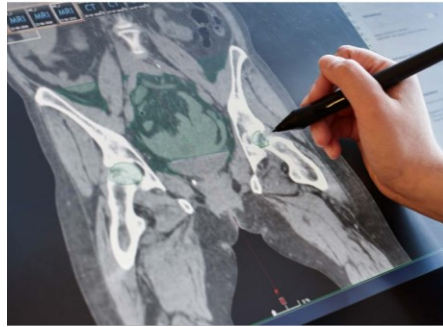


Prostata

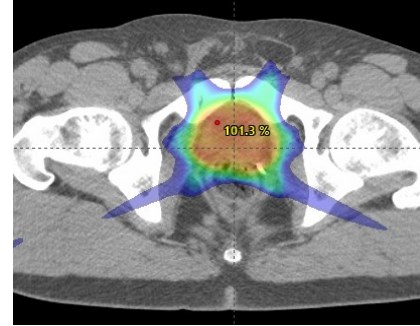




Terapiskanning



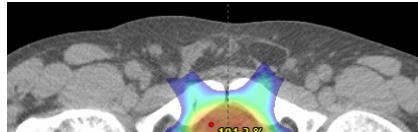
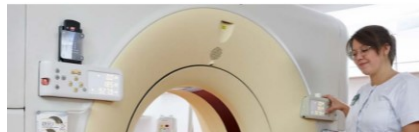
Indtegning



Dosisplan



Adaptiv behandling



Præcision ↑

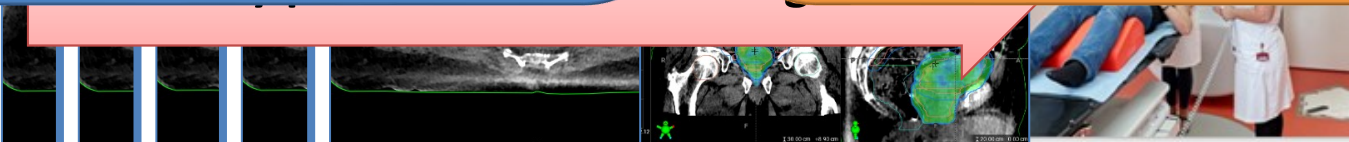
Sikkerhedsmargin ↓

Dosis til normalvæv ↓

Uddannelse ↑

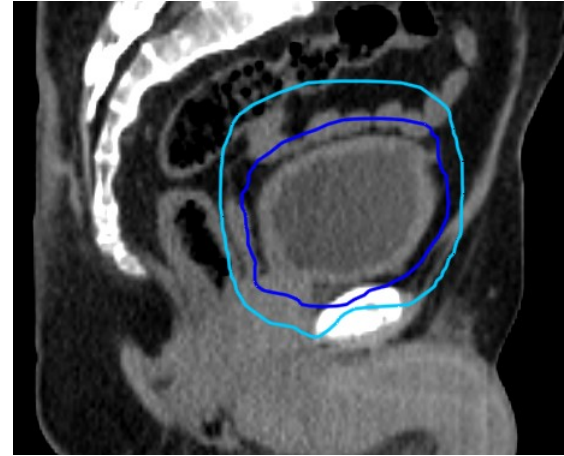
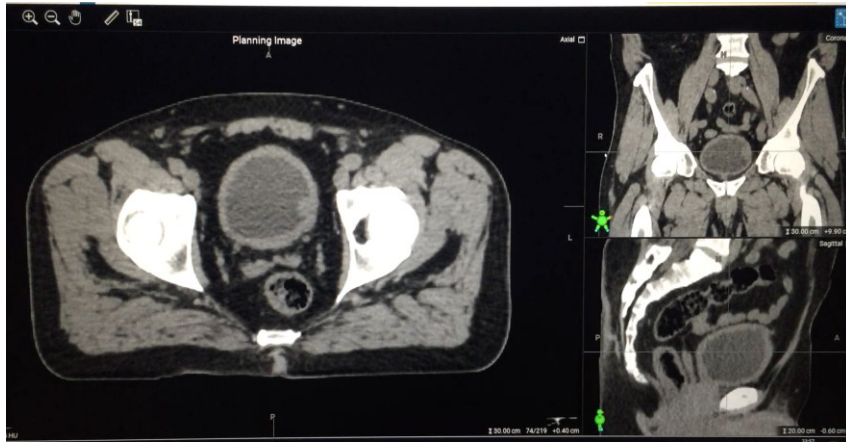
Behandlingstid ↑

Ressourcetræk ↑



Adaptiv behandling

Kan adaptiv strålebehandling mindske patient-rapporterede bivirkninger?



Kan adaptiv strålebehandling mindske patient-rapporterede bivirkninger?

ARTIA-Vesica

Blærekræft

Endepunkt: akut diarree

Multicenterstudie single arm

Sammenligning m historiske data

PRO-data

20/80 patienter inkluderet



PI – Katrine Storm

ROAR-A

Anal kræft

Endepunkt: akut diarree

Singlecenterstudie, single arm

Sammenligning med PLAN-A

PRO-data

130/220 patienter inkluderet



PI – Eva Serup-Hansen

Kan adaptiv strålebehandling mindske patient-rapporterede bivirkninger?

ARTIA-Vesica

Blærekræft

ROAR-A

Anal kræft

RTT-drevet online-adaptiv strålebehandling

PRO-data

20/80 patienter inkluderet



PI – Katrine Storm

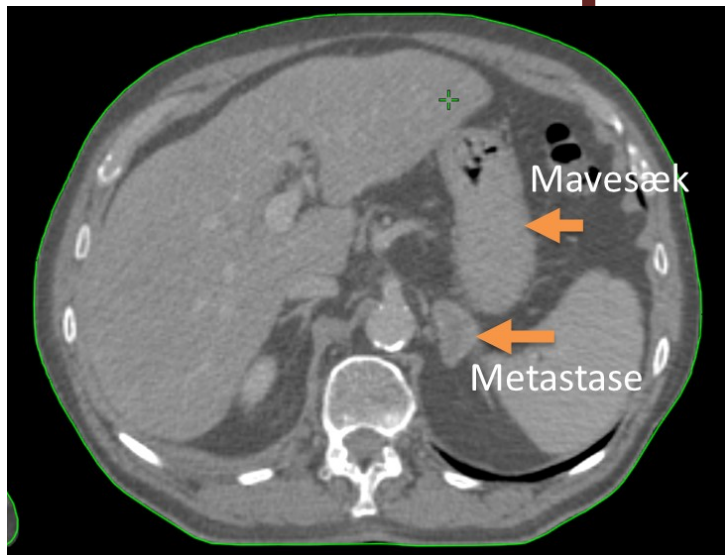
PRO-data

130/220 patienter inkluderet



PI – Eva Serup-Hansen

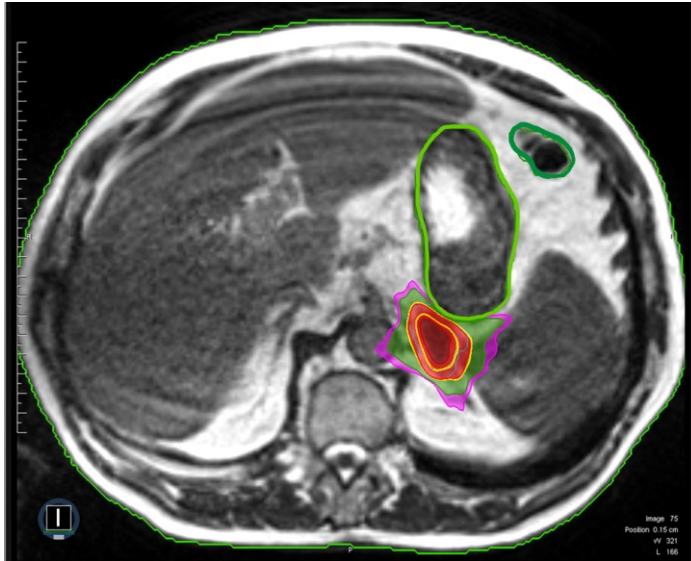
Tumorer med vanskelig anatomisk placering



Stereotaktisk strålebehandling

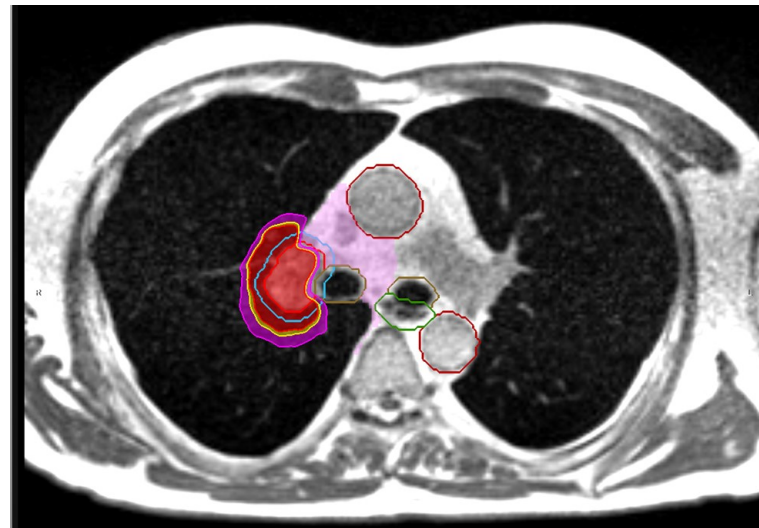
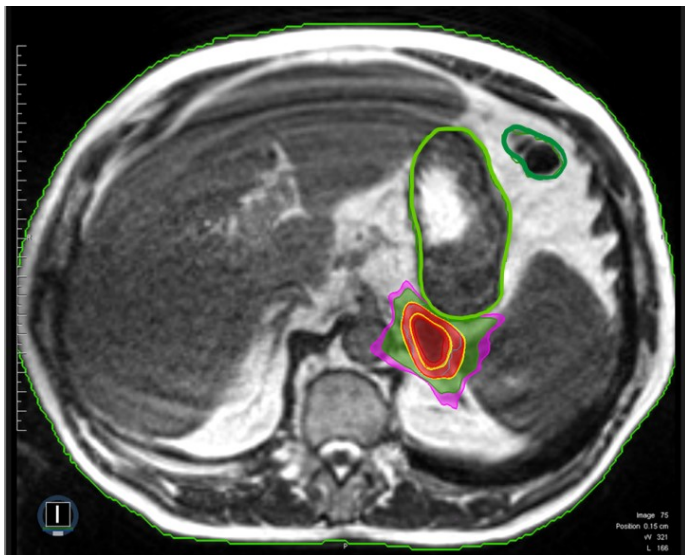
- Tæt på tæt følsomt væv
 - Hulorganer
 - Rygmarv
 - Hjerne og store kar
- Bevægelse med åndedrættet

MR-vejledt adaptiv strålebehandling



- med tidstro åndedræts-tracking

Adaptiv behandling på MR-Linac



Adaptiv behandling på MR-Linac

SOFT

Metastaser i abdomen

Endepunkt: alvorlige bivirkninger

Multicenterstudie single arm

PRO-data, CTCAE

120 inkluderede patienter

STAR LUNG

Ultra-centrale lungetumorer

Endepunkt: alvorlige bivirkninger

Multicenterstudie single arm

PRO-data, CTCAE

21/69 inkluderede patienter

Adaptiv behandling på MR-Linac

SOFT

1-års opfølgning:
Alvorlige bivirkninger:
Ulcus (1), Fatigue (3)

Lokal kontrol 87%

Afventer 3-års opfølgning

STAR LUNG

21/69 inkluderede

Interim analyse under
udarbejdelse



PI – Mette Felter



PI – Mette Pøhl

Virtual MR-Linac

samarbejde med Rigshospitalet



Fysiker Laura Rechner
Læge Mette Felter



Adaptiv strålebehandling

Opsummering

- Daglig AI-baseret dosisplan
- Øger præcision, mindsker normalvævsdosis
- Ressourcekrævende, men styres af RTT'er
- Kliniske studier dokumenterer gavn for patienterne

Tak for opmærksomheden

Tak til fysikere og læger i stråleterapien, Herlev Hospital

- Åström LM, Sibolt P, Chamberlin H, Serup-Hansen E, Andersen CE, van Herk M, Mouritsen LS, Aznar MC, Behrens CP. Artificial intelligence-generated targets and inter-observer variation in online adaptive radiotherapy of bladder cancer. *Phys Imaging Radiat Oncol*. 2024
- Storm KS, Åström LM, Sibolt P, Behrens CP, Persson GF, Serup-Hansen E. ROAR-A: re-optimization based Online Adaptive Radiotherapy of anal cancer, a prospective phase II trial protocol. *BMC Cancer*. 2024
- Åström LM, Behrens CP, Storm KS, Sibolt P, Serup-Hansen E. Online adaptive radiotherapy of anal cancer: Normal tissue sparing, target propagation methods, and first clinical experience. *Radiother Oncol*. 2022
- Åström LM, Behrens CP, Calmels L, Sjöström D, Geertsen P, Mouritsen LS, Serup-Hansen E, Lindberg H, Sibolt P. Online adaptive radiotherapy of urinary bladder cancer with full re-optimization to the anatomy of the day: Initial experience and dosimetric benefits. *Radiother Oncol*. 2022
- van Overeem Felter M, Møller PK, Josipovic M, Bekke SN, Bernchou U, Serup-Hansen E, Madsen K, Parikh PJ, Kim J, Geertsen P, Behrens CP, Vogelius IR, Pøhl M, Schytte T, Persson GF. MR-guided stereotactic radiotherapy of infra-diaphragmatic oligometastases: Evaluation of toxicity and dosimetric parameters. *Radiother Oncol*. 2024
- van Overeem Felter M, Møller PK, Josipovic M, Bekke SN, Bernchou U, Serup-Hansen E, Parikh P, Kim J, Geertsen P, Behrens CP, Madsen K, Vogelius IR, Topsøe JF, Berthelsen AK, Pøhl M, Schytte T, Persson GF. 1-year efficacy results after MR-guided risk-adapted stereotactic radiotherapy of infra-diaphragmatic oligometastases in a multicenter phase II trial. *Radiother Oncol*. 2025
- Sten LJ, Giannoulis E, Rechner LA, Åström L, Nielsen AM, Edmund JM, Fredberg Persson G. Simulation-free cone beam CT-based online adaptive radiotherapy for metastatic spinal cord compression. *Acta Oncol*. 2025