

Klinische Routine mit SGRT

– der Mehrwert für Patienten

vision ϕ rt

28.-29.05.2018 AK IMRT und Computer in Hamburg

Dipl.Ing.(FH) Thomas Wagner

Strahlentherapie am Klinikum Bayreuth

- ca. 1200 Patienten/Jahr
- 2 Elekta Linacs im Tandembetrieb mit Agility Kopf (2016 Versa HD)
- Aussenstelle Kulmbach Elekta Synergy MLCi2 Kopf
- Abteilungseigenes CT Siemens AS20 open
- Planungssystem Pinnacle 9.10, Prof.Server, AutoPlan
- **SGRT seit 08/2016 der Fa. visionRT**
- Verifikation der IMRT: Patientenplanbasiert, 100%, IBA Compass Dolphin (Pre-Treatment)
- Brachytherapie (Eckert & Ziegler)

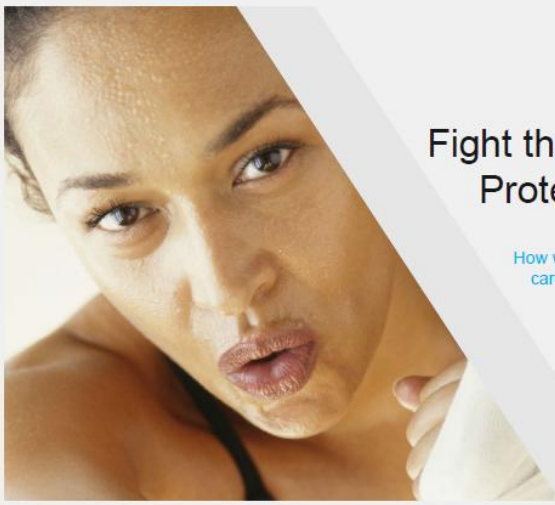
Introducing AlignRT

Fight the cancer.
Protect the heart.

How we use AlignRT to help prevent cardiac toxicity in left-breast radio

Joe Deister
Regional Sales Manager
Vision RT

AK IMRT 03.04.2017 Münster



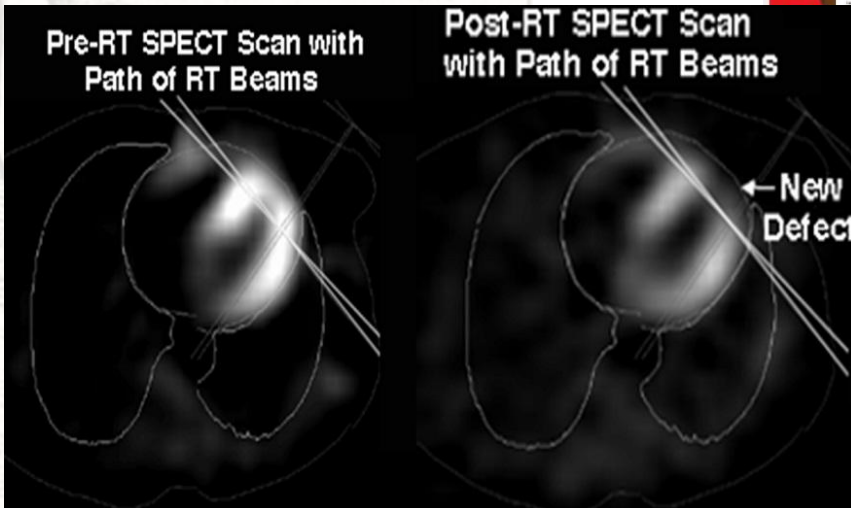
Proven

Why AlignRT is different

10 published papers in DIBH showing reproducibility of the technique / reduction in cardiac dose^{6,12-20}

- New study suggests prevention of cardiac perfusion defects for left breast patients at 6 month follow-up¹⁰
- Monitors patient surface throughout treatment in all 6 degrees of freedom
- Adds no time to procedure⁶
- Completely safe and non-invasive: no radiation exposure, non-contact
- Published papers also show value for AlignRT use in other indications including non-DIBH breast, brain, head and neck, sarcoma and other cancers²¹⁻³⁰

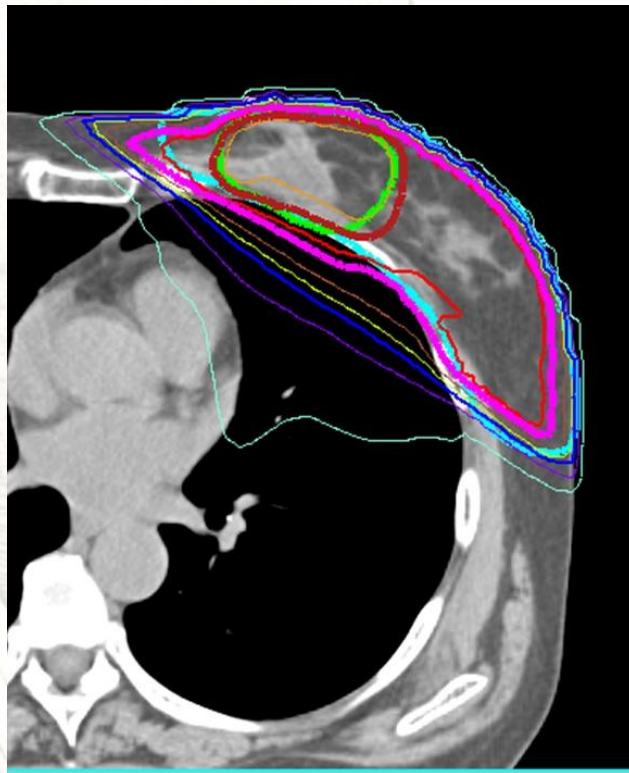
To review papers, visit VisionRT.com/heartstudies



From L.Marks; Univ North Carolina Chapel Hill.

Klinisches Beispiel

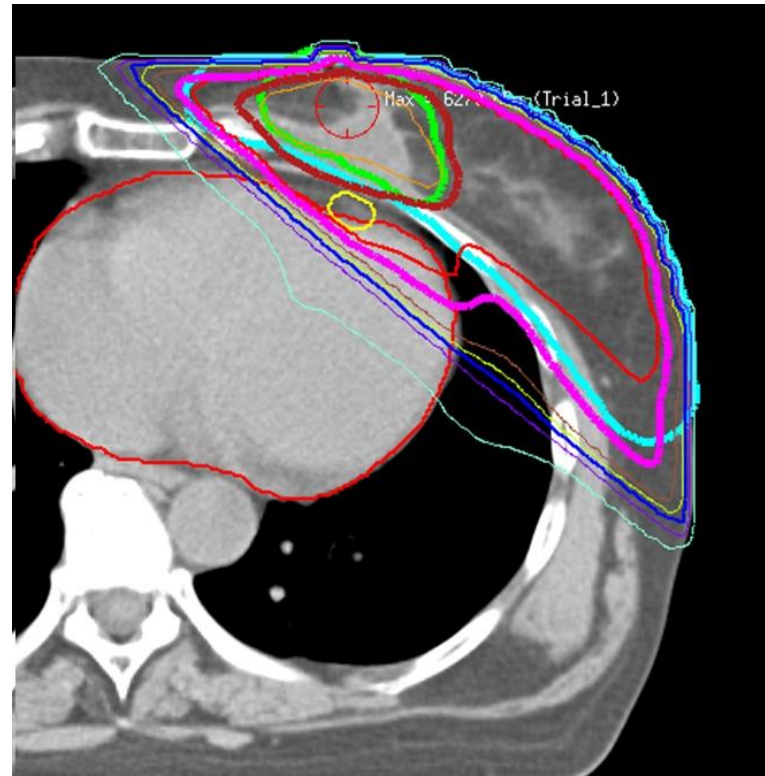
Deep Inspiration Breath Hold



MHD 1,7Gy

RIVA 8,5Gy

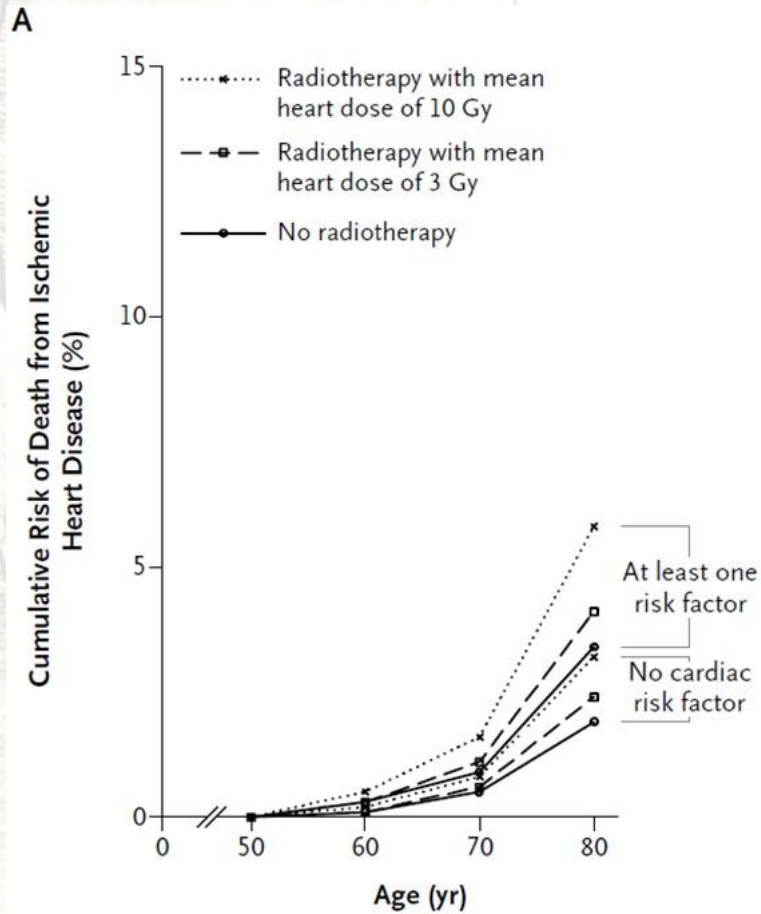
freie Atmung



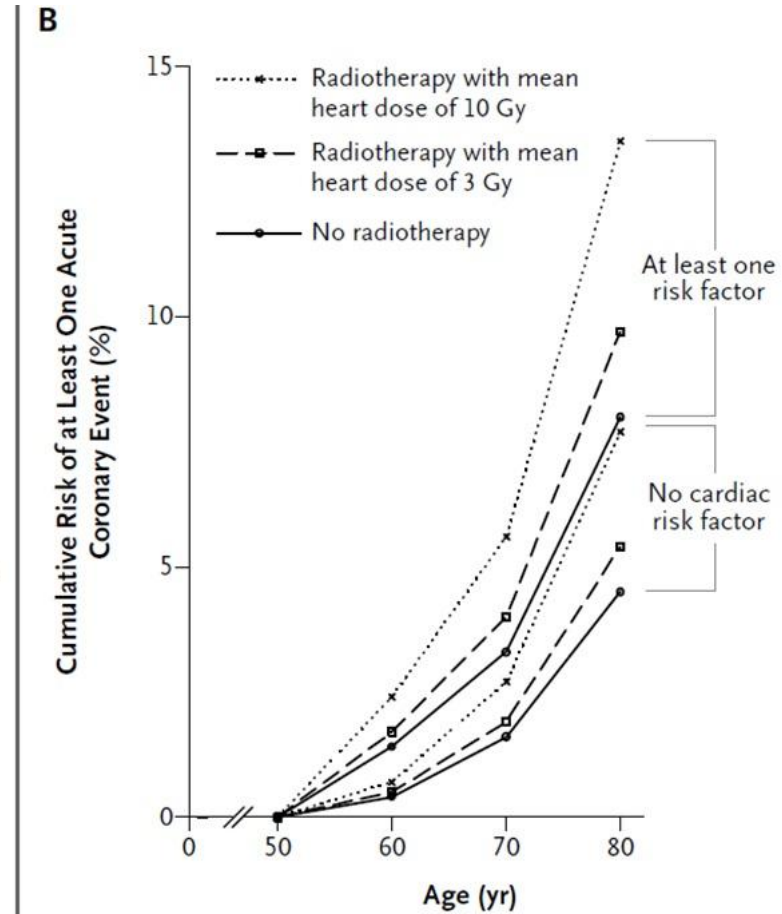
MHD 4,8Gy

RIVA 34,7Gy

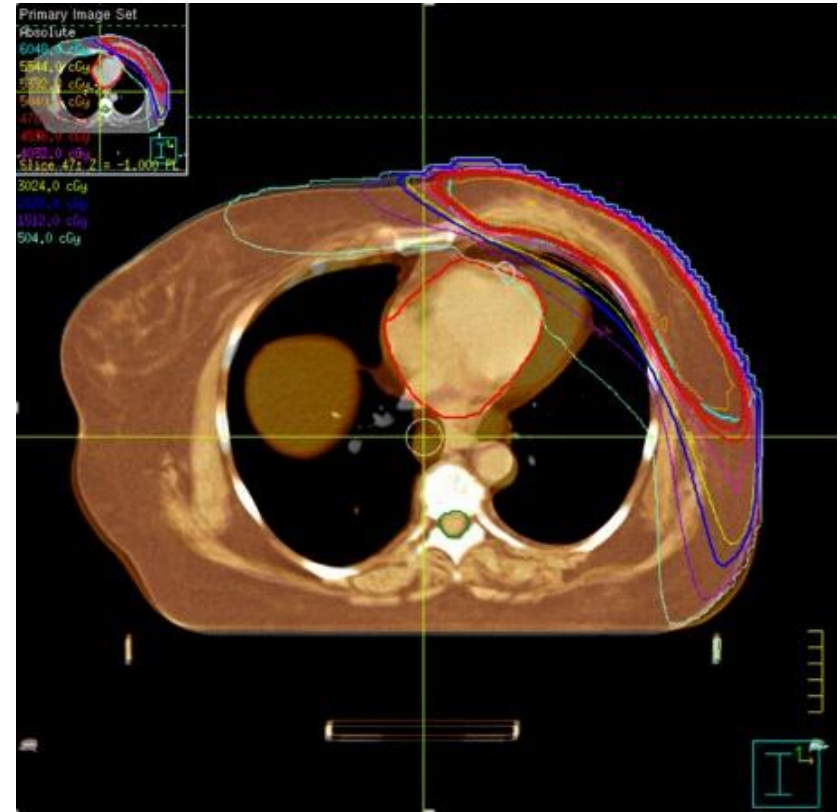
Sterberisiko



Risiko für Akutes Koronarsyndrom

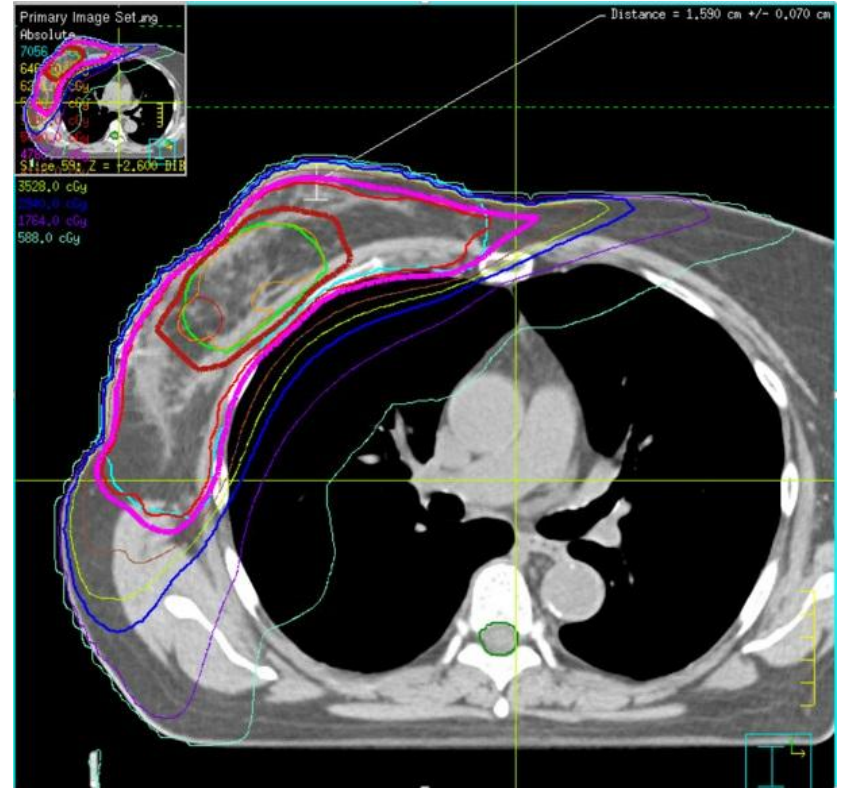
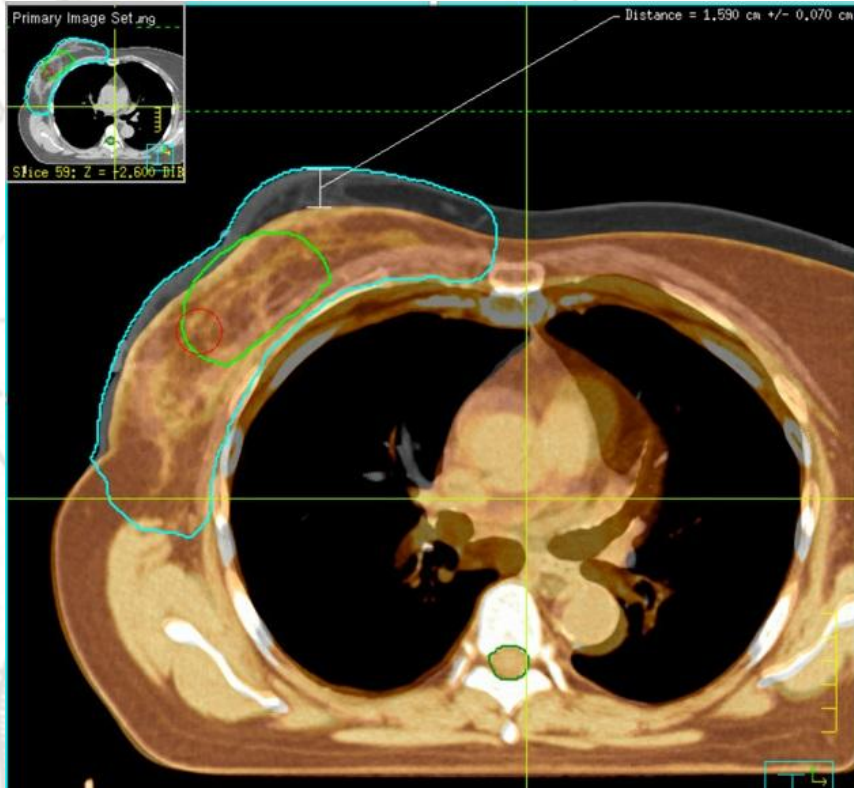


Klinisches Beispiel



äußere Verschiebung vs. innerer Verschiebung

Klinisches Beispiel





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Abteilungsausstattung

CT: 1 Kamera Pod + 1 Workstation GateCT für 4D CT
Planungen

Linacs: 3 Kamera Pods + 1 Workstation mit AlignRT + RTC +
Elekta Response Interface

am Stereotaxiebeschleuniger Versa zusätzlich GateRT
und SRS Modul

zusätzliche Workstation in med. Physik

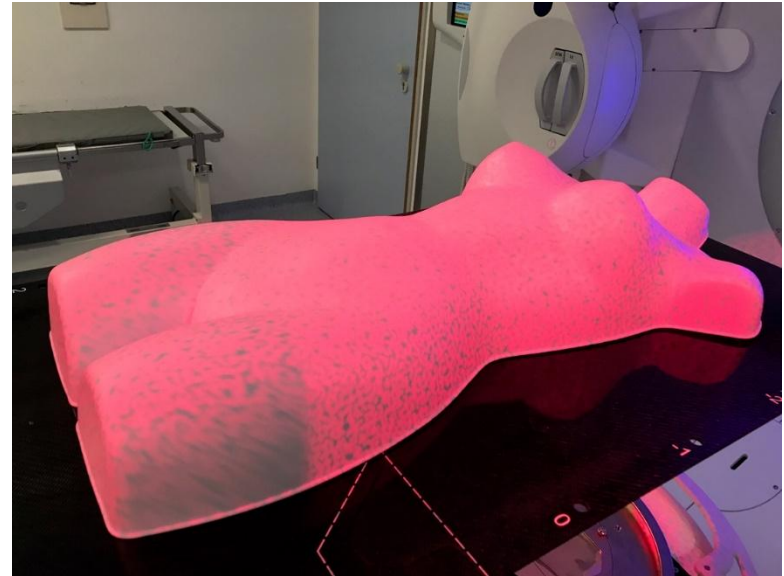
1 Patientendatenbank an allen Workstations aufrufbar

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Abteilungsausstattung



visionrt Abteilungsausstattung



retrospektiv (SBRT) oder
prospektiv gated (DIBH)



vision RT



Atemkurve

Überwachung
Beamtrigger



Dichte, Geometrie

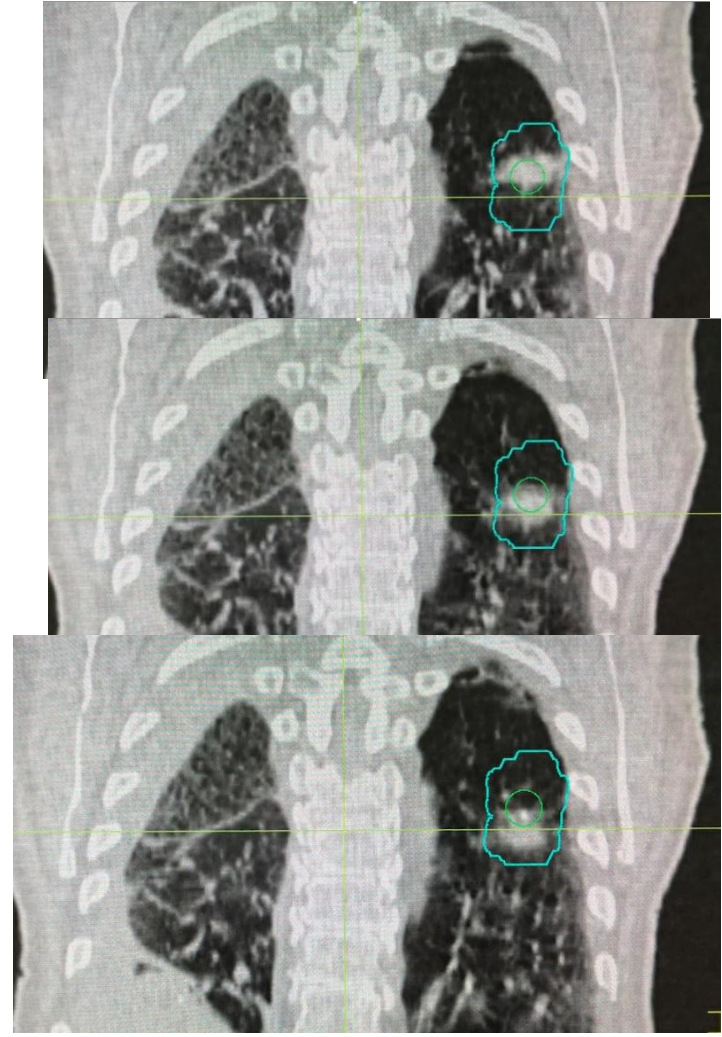
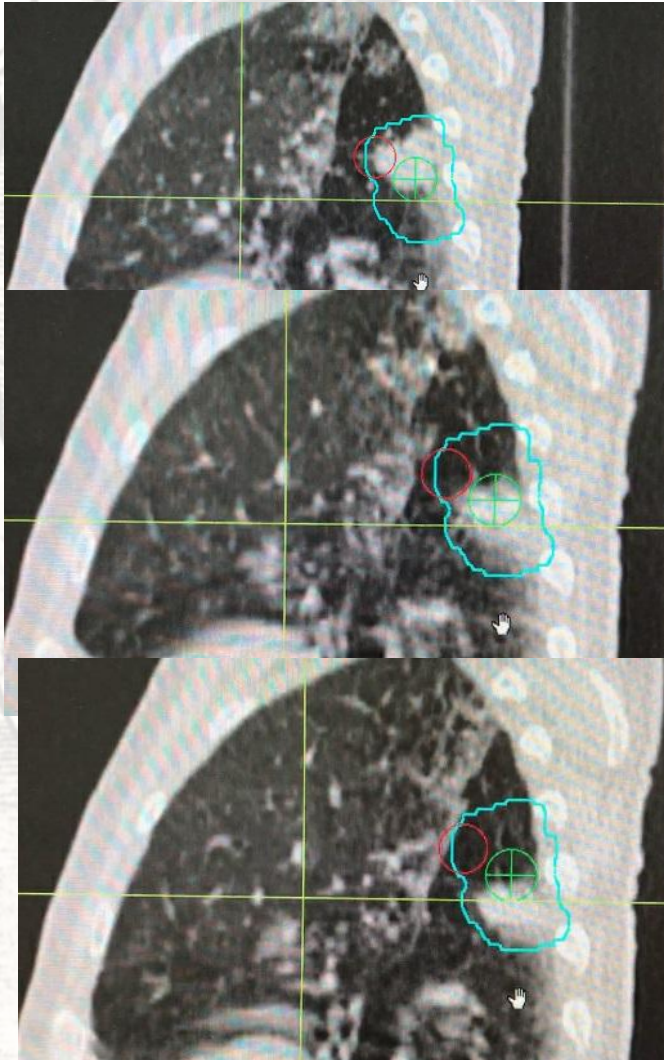
Oberfläche
Isozentrum

Plan



TPS

Klinisches Beispiel



alignrt® Uli TEST (Female) DOB: 1-Jan-1970 1324354

User: physik (Physicist) Version 5.0.1749

Left Breast Mamma re IB.0 (-9.71, -26) Ma re FB VRT

Monitoring 0.0 Couch Rotation Default ROI ROI Selection Move Couch Surface Tools Edit ROI Initial Setup

Settings Reference Capture Threshold Edit Mode Skintone Mid Gate Beam OFF

VRT_{cm}	0.14	
LNG_{cm}	-0.54	
LAT_{cm}	-0.57	
MAG_{cm}	0.79	
YAW°	-0.3	
Roll°	1.7	
Pitch°	0.5	

Beam HELD

Continuous Real-Time Deltas Coaching

Frame Rate: 3.3

Patient movement outside tolerance IEC 60601-2-1

alignrt® Uli TEST (Female) DOB: 1-Jan-1970 1324354 User: physik (Physiologist) Version 5.0.1749

Patient: Left Breast Mamma re IB.0 (-9.71 , -26) Site/Isocentre
Field/Reference: Ma re FB VRT
Settings Reference Capture Threshold Edit Mode Skintone: Mid
Monitoring Couch Rotation 0.0 ROI Selection Default ROI Move Couch Surface Tools Edit ROI Initial Setup Gate Beam OFF

VRT _{cm}	0.00
LNG _{cm}	0.00
LAT _{cm}	0.00
MAG _{cm}	0.00
YAW°	0.0
Roll°	0.0
Pitch°	0.0

Beam HELD

Continuous Real-Time Deltas Coaching

Frame Rate: 3.5

Monitoring patient movement...

IEC 60601-2-1

V-RT PHILIPS

Bestrahlung in DIBH

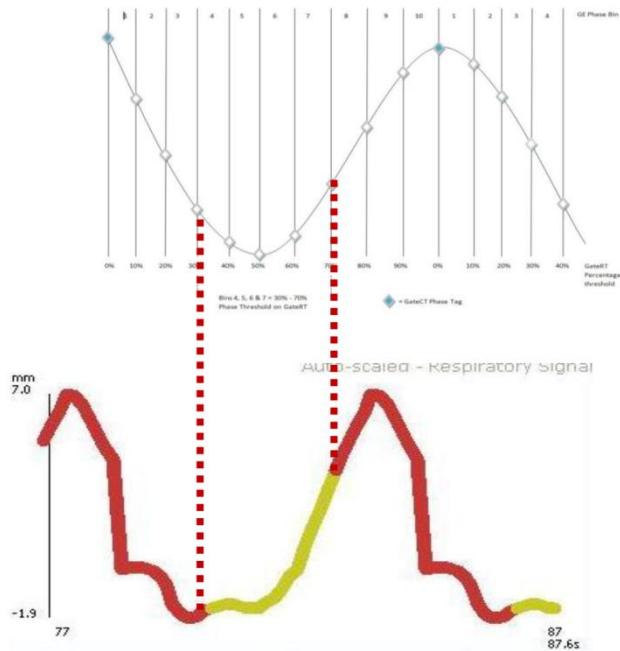




Monitoring patient movement...

Gate RT

wirkliches Gating nach Phase oder Amplitude, mit on/off - Steuerung des Linacbeams



The screenshot shows the 'gatert' software interface for a patient named 'Uli Test (Female)' with ID '1324354'. The interface is divided into several sections:

- PATIENT & SETUP:** Includes buttons for CAPTURE, TRACK, and REVIEW & EXPORT.
- Site:** Left Breast
- Phase:** Mamma re iB.0 (-9.71, -26.73)
- Field:** ISOCENTER FIELD
- Surface:** Mamma li iB

Control buttons include 'START TRACKING' and 'GATING OFF'. The 'Efficiency' is shown as 0.0%.

Point Selection: Includes buttons for 'RESPIRATORY', 'MONITORING', and 'PHASE TAG'.

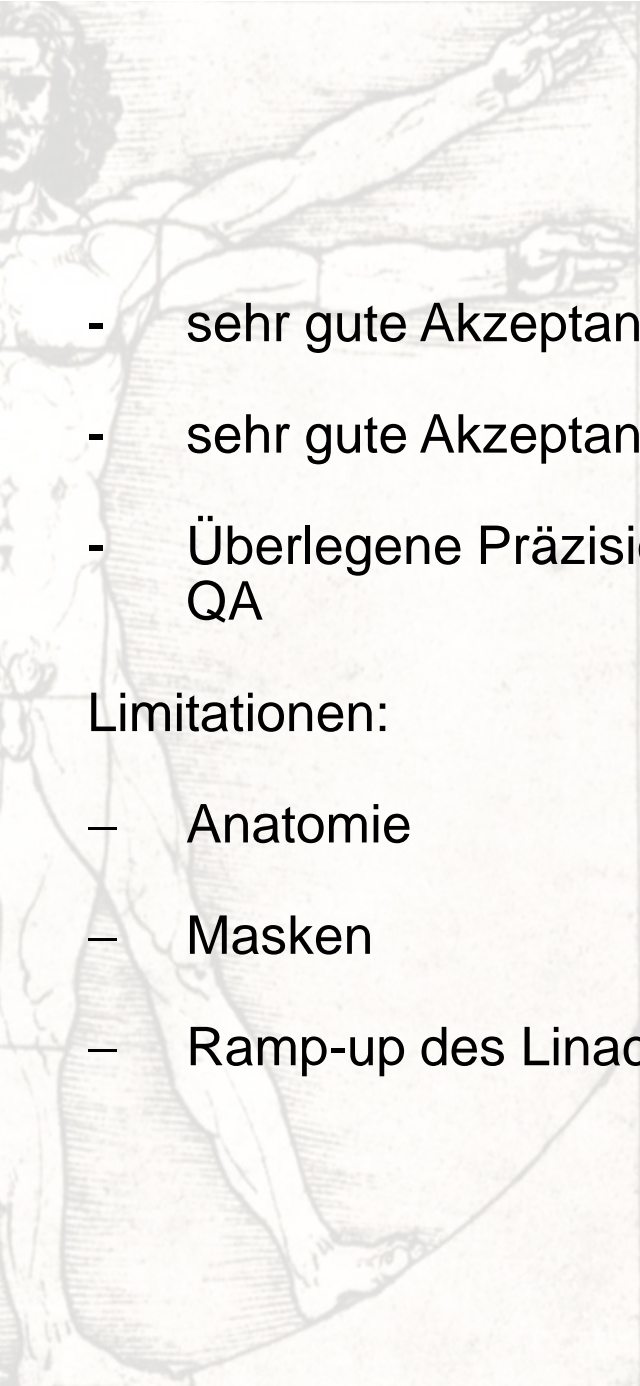
Thresholds: Min 0.00 mm, Max 0.00 mm. The 'Gate' is set to 'Amplitude'.

Abnormal Breathing Detection: Includes buttons for 'AMPLITUDE', 'PERIOD', and 'HEIGHT'. The 'Average Amplitude (mm)' is 0.2, and the 'Standard Deviation (S.D.)' is 0.3. The 'Use' checkbox is checked. The 'Min' and 'Max' values are 0.0 and 2.0 x S.D. respectively.

At the bottom right, there is a 'CAPTURE SETTINGS' button.

On the right side of the interface, there are four monitoring windows:

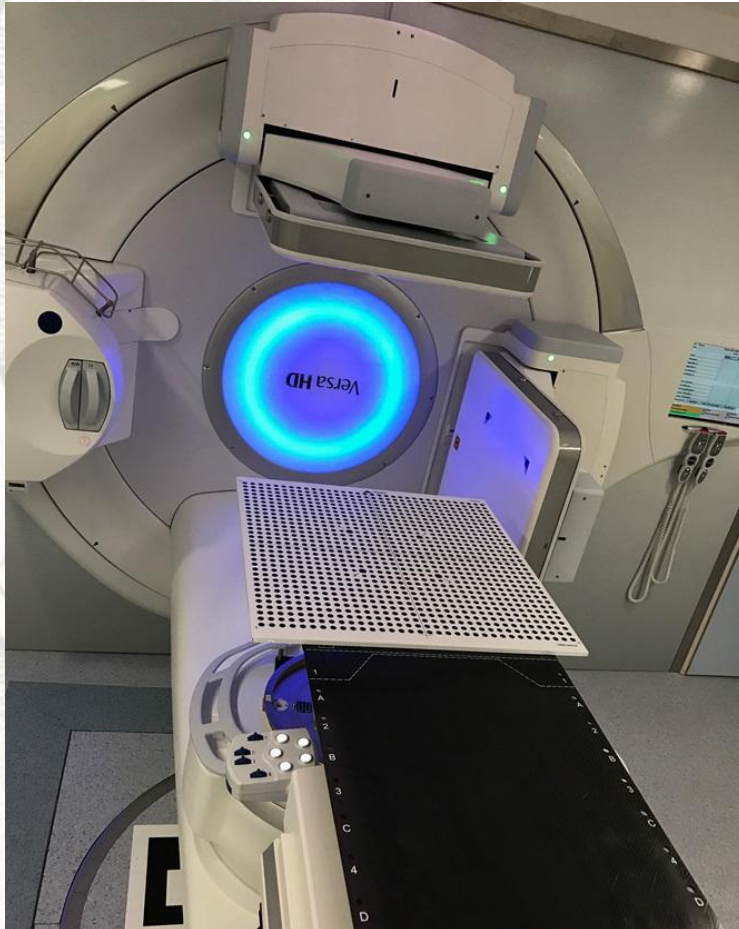
- Beam Status:** Shows a 3D model of a patient's torso with a green arrow pointing to the treatment area. A yellow box in the top right corner says 'Beam HELD'.
- Beam State:** Shows a red respiratory waveform with a legend for 'Beam Off' (red) and 'Beam On' (green).
- Auto-scaled - Monitoring Signal:** Shows a red respiratory waveform.
- Auto-scaling - Abnormal Breathing - Amplitude:** Shows a blue waveform representing abnormal breathing amplitude.

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- sehr gute Akzeptanz bei den Patienten
 - sehr gute Akzeptanz bei den Mitarbeitern
 - Überlegene Präzision -> sogar für Phantomplatzierungen bei der QA

Limitationen:

- Anatomie
- Masken
- Ramp-up des Linac

Qualitätskontrollen



Vom Hersteller gefordert:

arbeitstaglich: ca. 2min

Monatlich: ca. 5min
+ 15 min SRS Modul

Zusatzlich:
Überprüfung der Linac-Schnittstelle mit
CIRS Phantom



Vielen Dank für die Aufmerksamkeit!