

IMPLEMENTING SGRT FOR STEREOTACTIC TREATMENTS: PRACTICAL STEPS FOR A SUCCESSFUL START



27.11.2025

Joana Gomes
Chief RTT, MSc
Klinik für Radio-Onkologie – KSW
Zentrum für Radiotherapy Rüti - ZRR

zrr
Zentrum für Radiotherapie
Rüti Zürich-Ost-Linth AG

KSW Kantonsspital
Winterthur

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Overview

KSW

2 Varian Truebeam - **AlignRT**
1 CT (Canon / Toshiba Aquilion LB) - **SimRT**
Orthovolttherapie: WOmed T200
Brachytherapie: Varian GammaMed iX
Hyperthermie: Hydrosun TWH1500



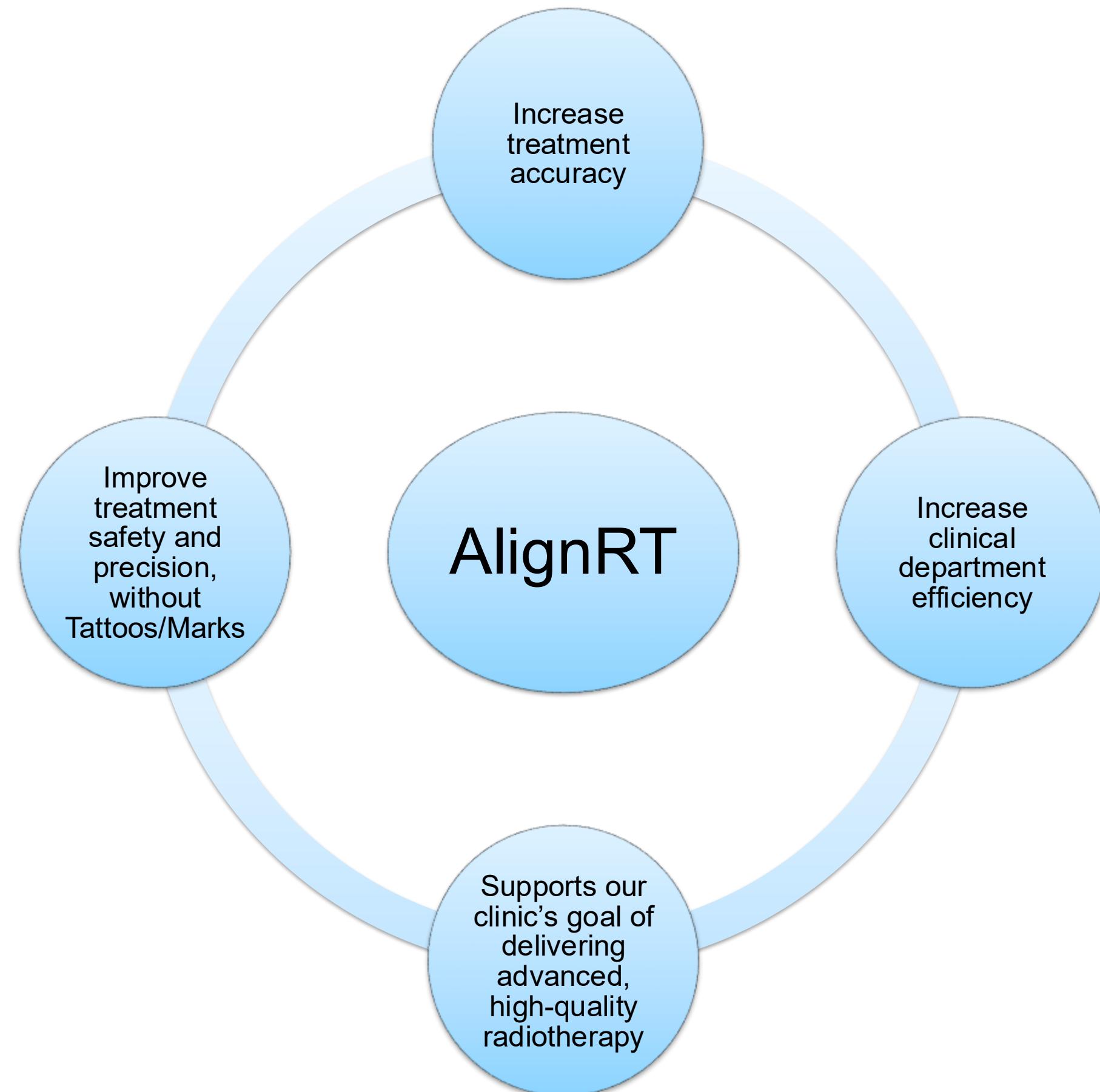
ZRR

1 Varian Truebeam - **AlignRT**
1 CT (Philips Brilliance CT Big Bore) – **SimRT**
Orthovolttherapie: WOmed T105



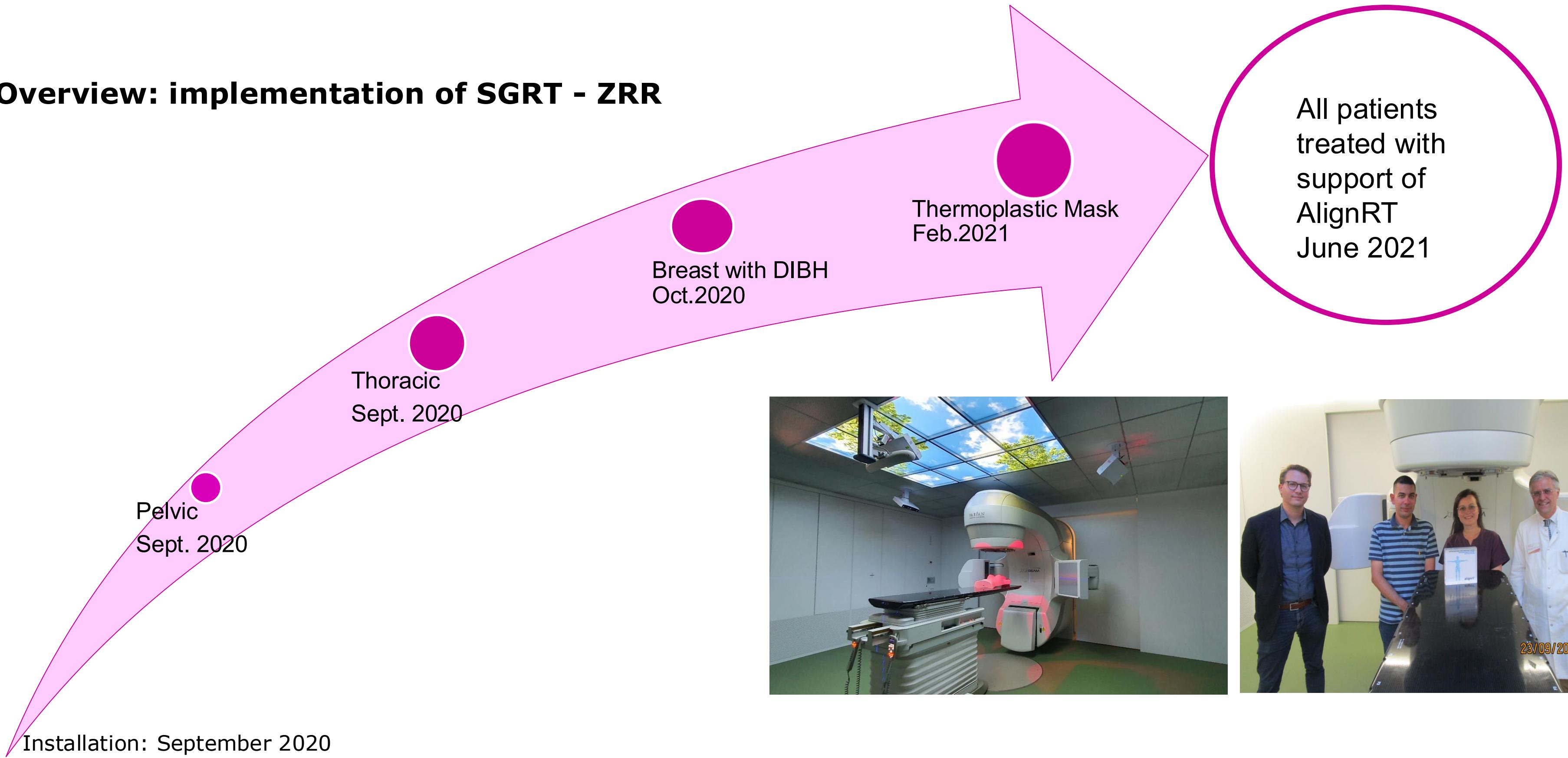
Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Why SGRT?



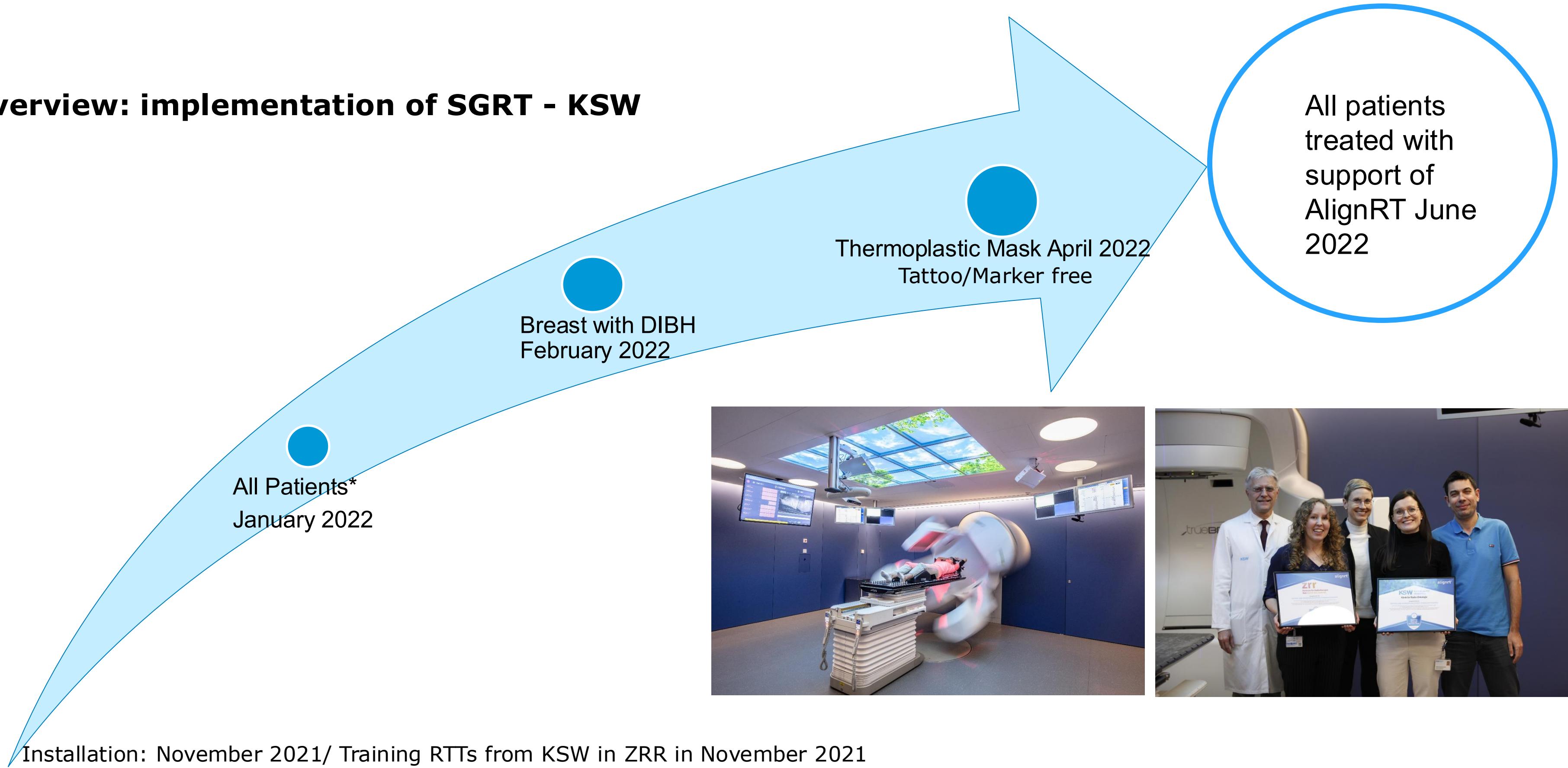
Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Overview: implementation of SGRT - ZRR



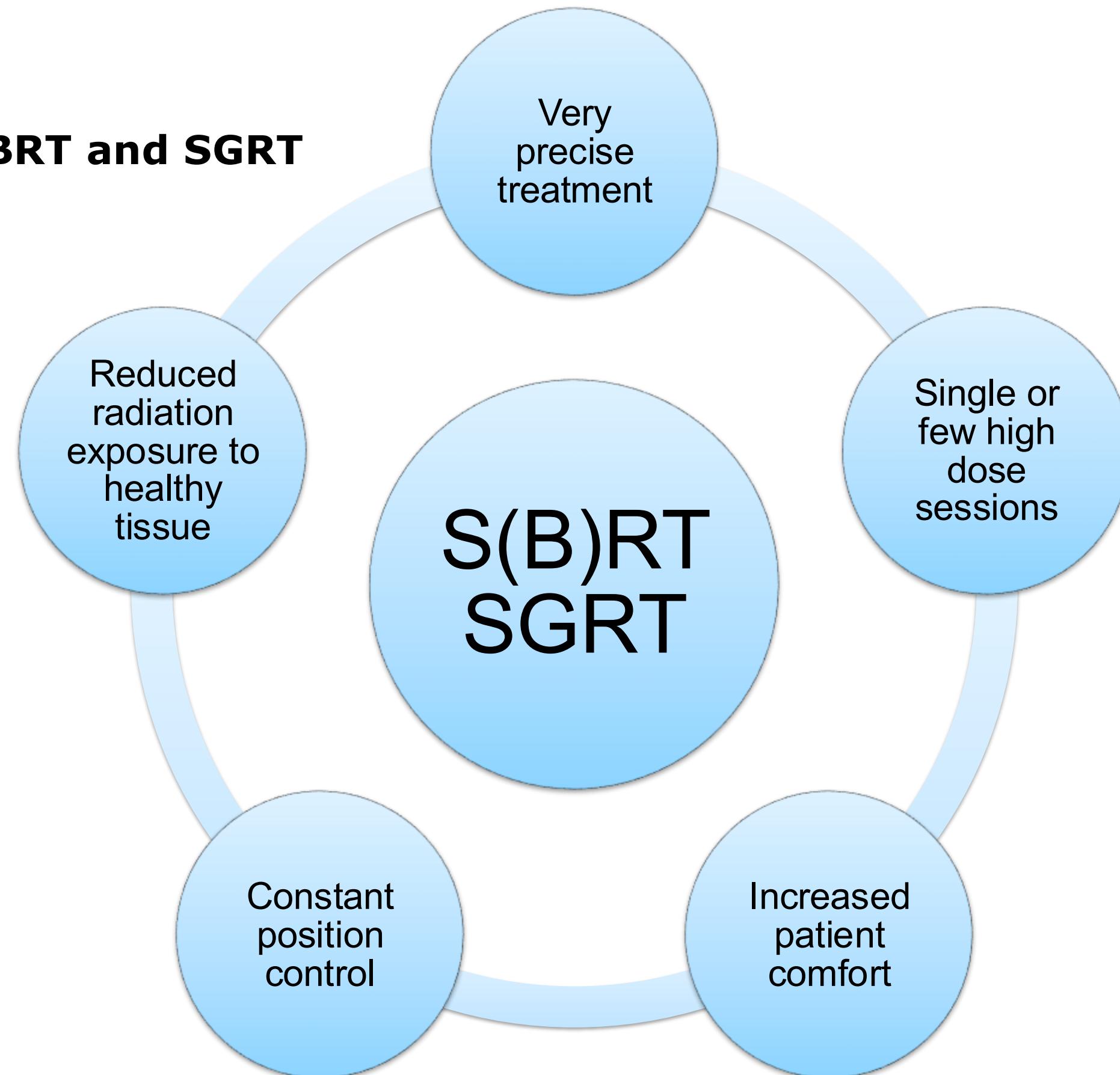
Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Overview: implementation of SGRT - KSW



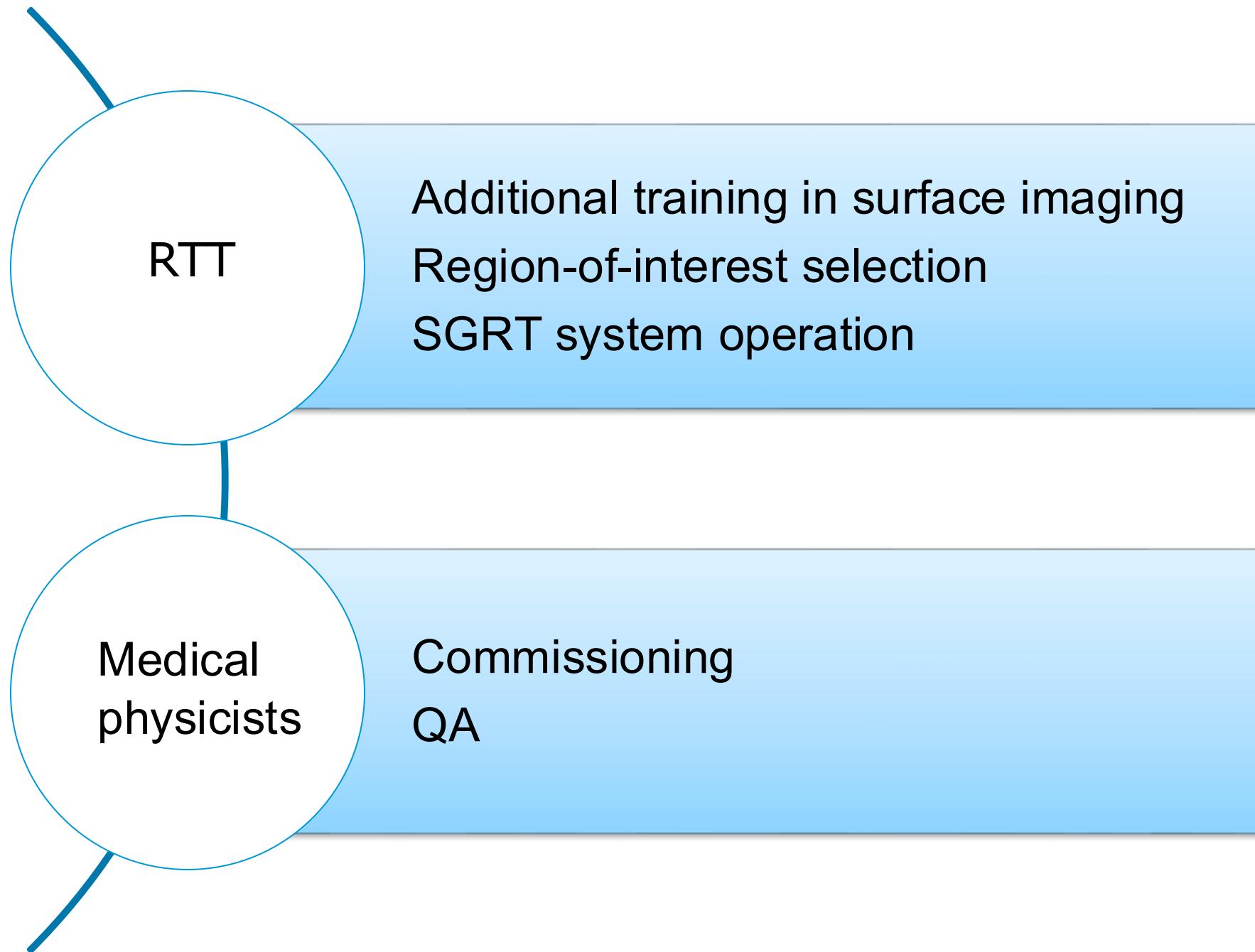
Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Combination of SRT/SBRT and SGRT



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

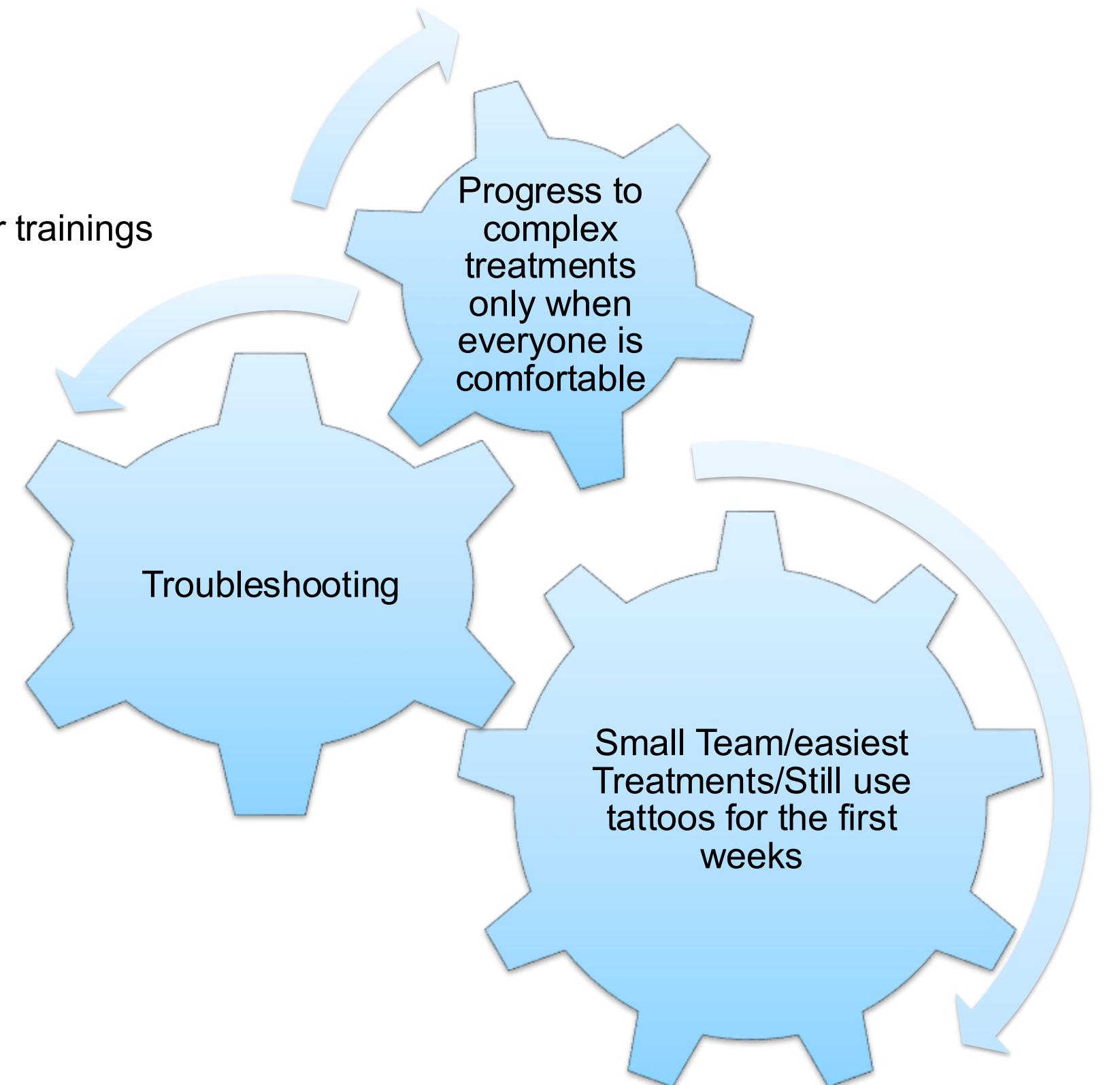
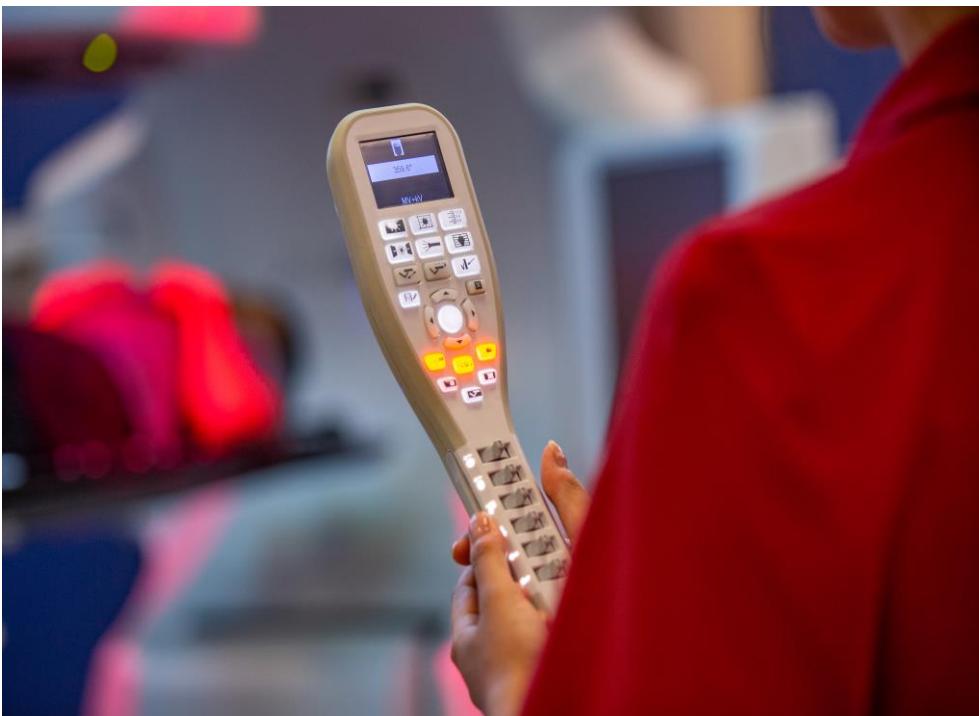
Staff Implications and Training Requirements



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

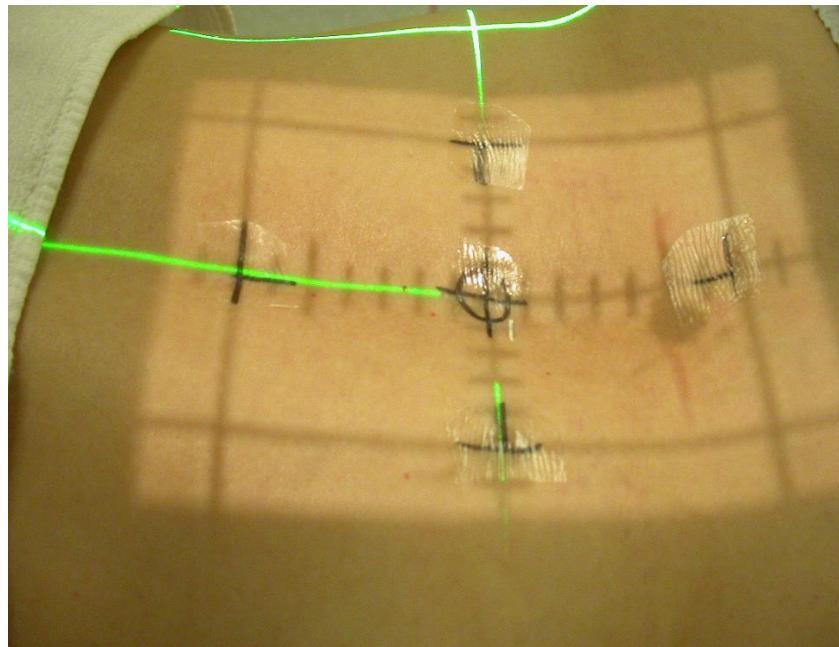
Staff Implications and Training Requirements

- Training with Application Specialist from VisionRT Team
- Definition of the responsible RTTs to develop the SOPs/Troubleshooting and for trainings
- Internal Meetings to develop the SOPs
- Presence of RTTs with experience as 3. Person
- Medical Physicist for 1st treatment
- Regular feedback meetings to update SOP/Troubleshooting practices
- One to one meetings – ROI definition
- Regular in House trainings to keep the team updated
- SGRTuesdays



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Looking back our journey in KSW: How treatment used to be in 2004 😊



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

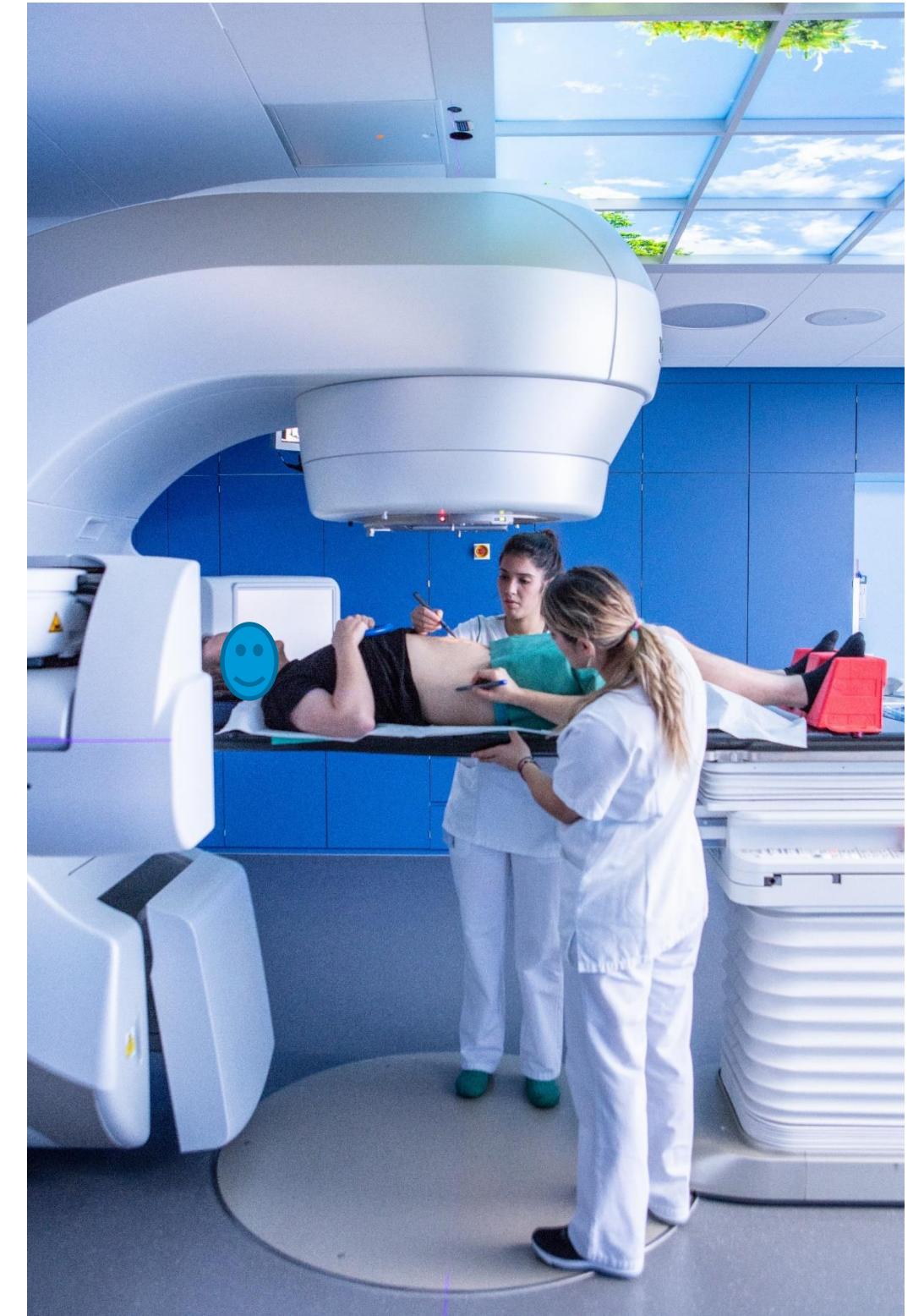
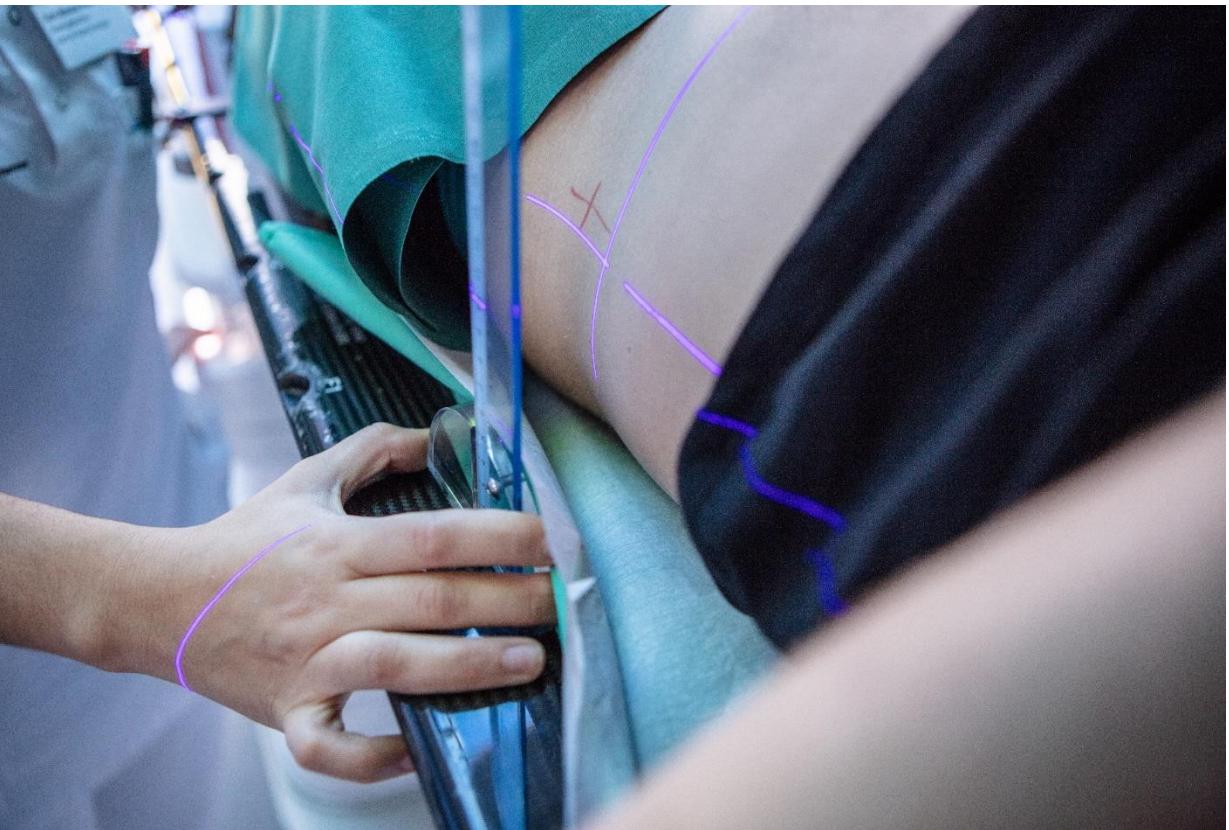
Clinical workflow comparison at planning-CT: Without vs. with SimRT



Tattoos—A thing of the past

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Standard clinical workflow at Linac (Pre-AlignRT)



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Clinical workflow comparison at linac: With AlignRT



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Clinical workflow comparison at treatment console: Without vs. with AlignRT



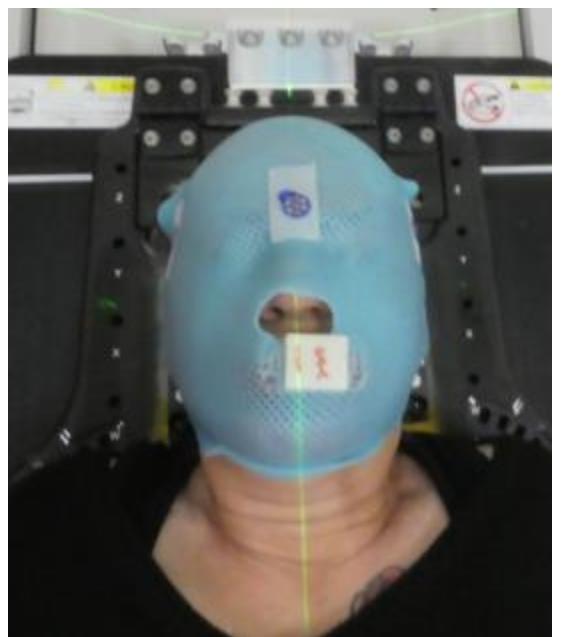
2019, without AlignRT



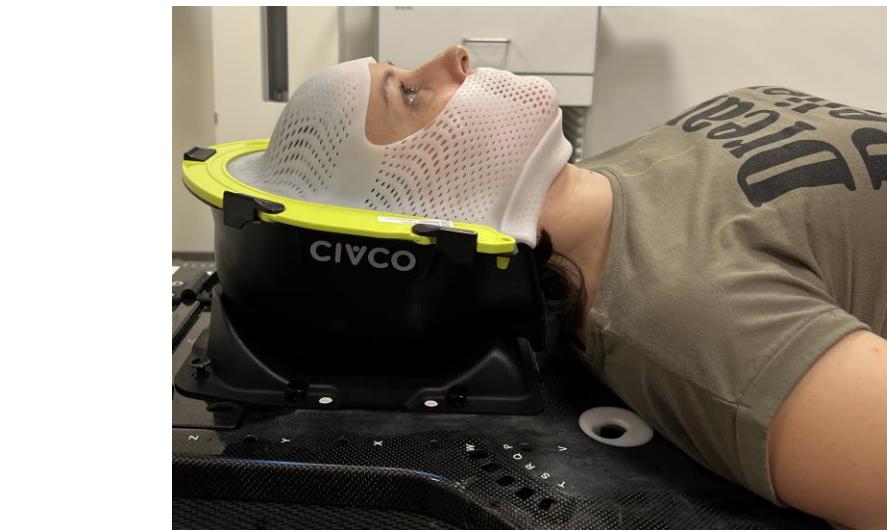
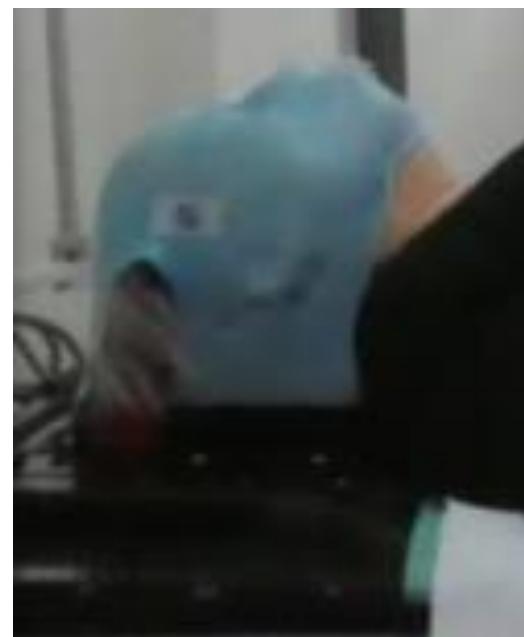
2022, with AlignRT

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

SRS/SRT closed-face mask (until 2021/2022) vs. open-face mask with AlignRT (after 2021/2022)



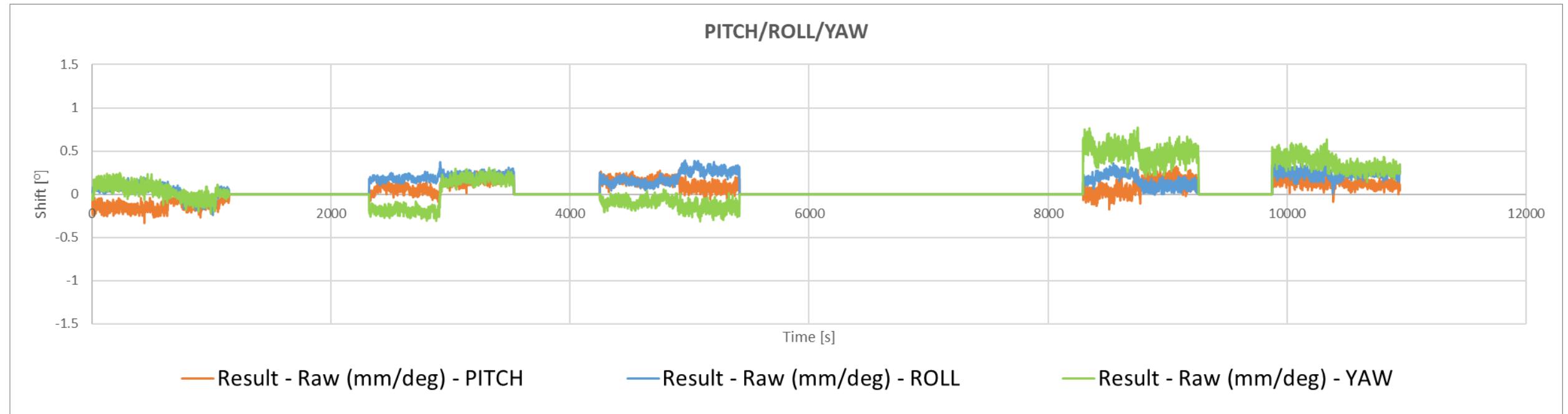
CFM with bite-block, CQ Medical



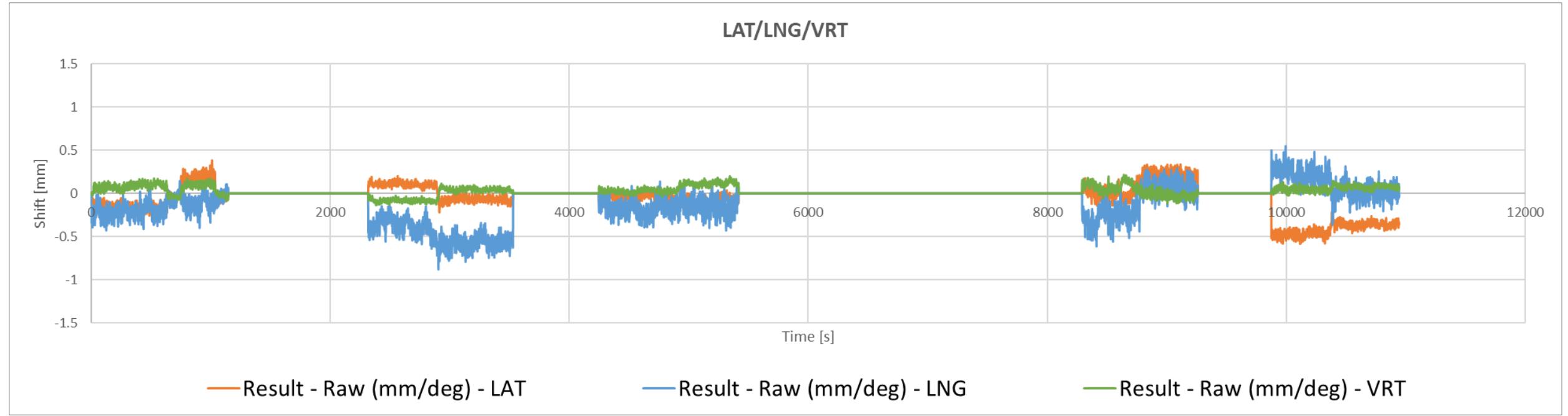
OFM without bite-block (Solstice™ SRS, 3.2 mm; CQ Medical™)

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Open-face mask with AlignRT at linac



Set up with AlignRT



AlignRT 6DoF/Real Time Delta during beam on ($\leq 1^\circ$ & $\leq 1\text{mm}$)

Own Data

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Case Study: Closed versus open face mask with AlignRT (SRS/SRT)

Results:

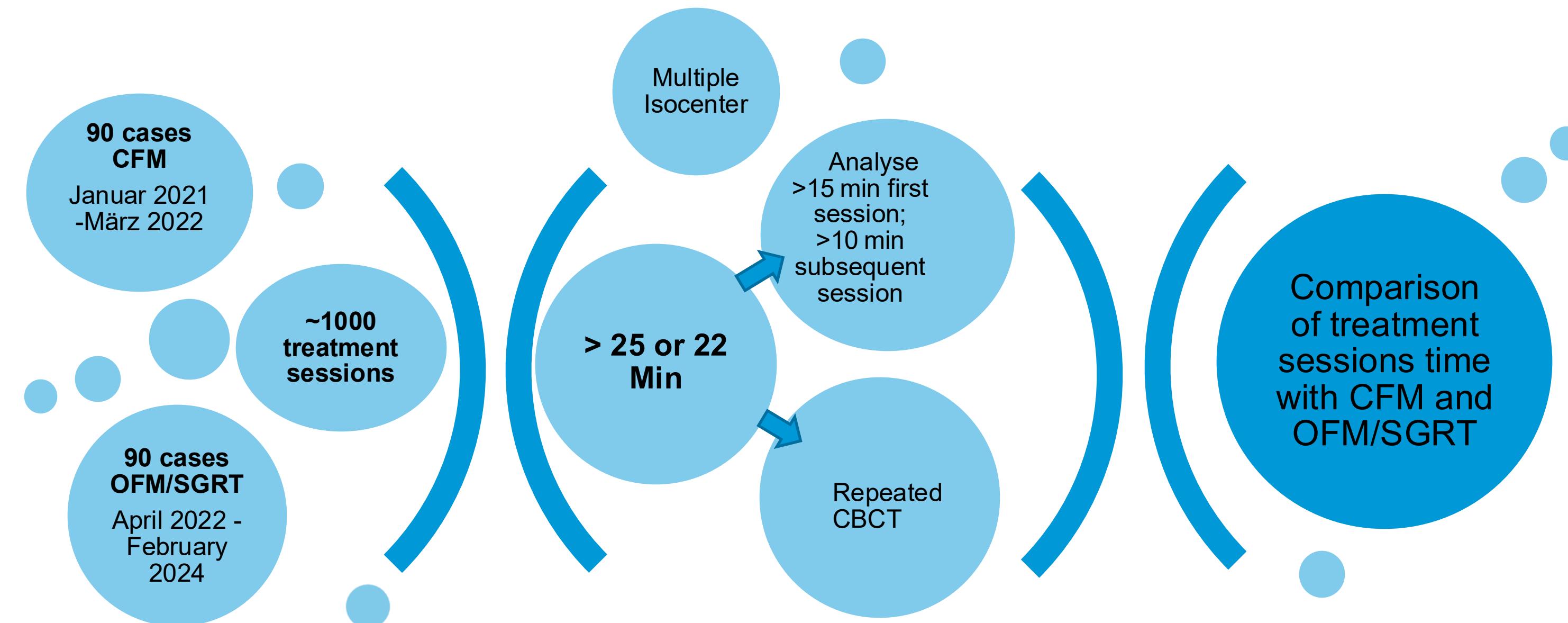
Better set up accuracy

Reduced repositioning and repeat imaging

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Case Study: Difference in Treatment Time: Closed-Face Mask (CFM) vs. Open-Face Mask with AlignRT (OFM/SGRT)

Retrospective Analysis of **Treatment Time** in Brain Metastases Patients Treated with SRT/SRS (2020-2024)

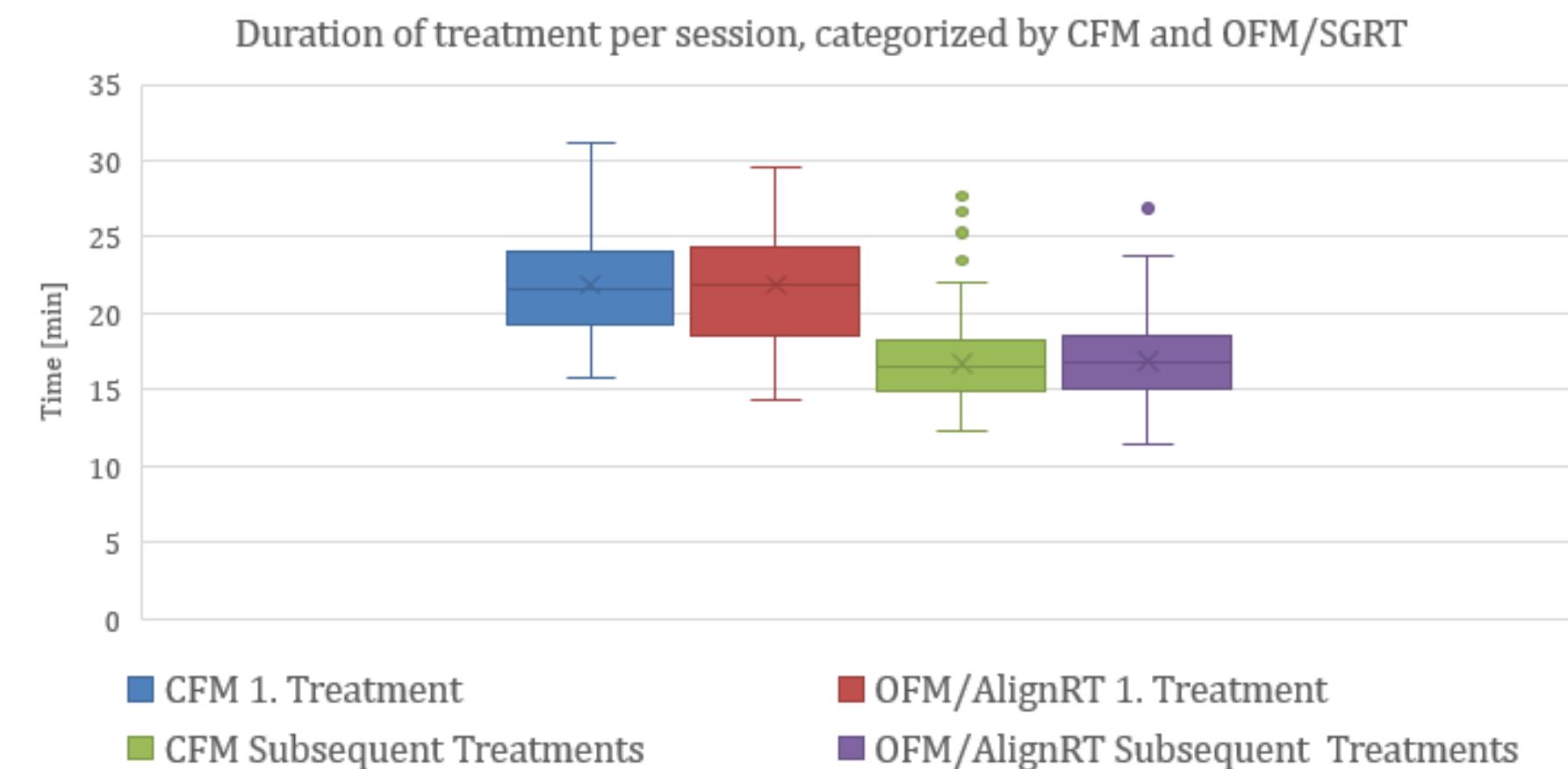


Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Case Study: Difference in Treatment Time: Closed-Face Mask (CFM) vs. Open-Face Mask with AlignRT (OFM/SGRT)

Results:

Mask type	Number of sessions	Mean \pm SD (min)	Min – Max (min)	p-value (T-test)
First session - OFM/SGRT	59	21.9 ± 3.6	14.3 - 29.6	p = 0.98
	57	21.9 ± 3.3	15.7 - 31.1	
Subsequent session - OFM/SGRT	240	16.9 ± 2.6	11.3 - 26.9	p = 0.47
	212	16.7 ± 2.6	12.3 - 27.7	

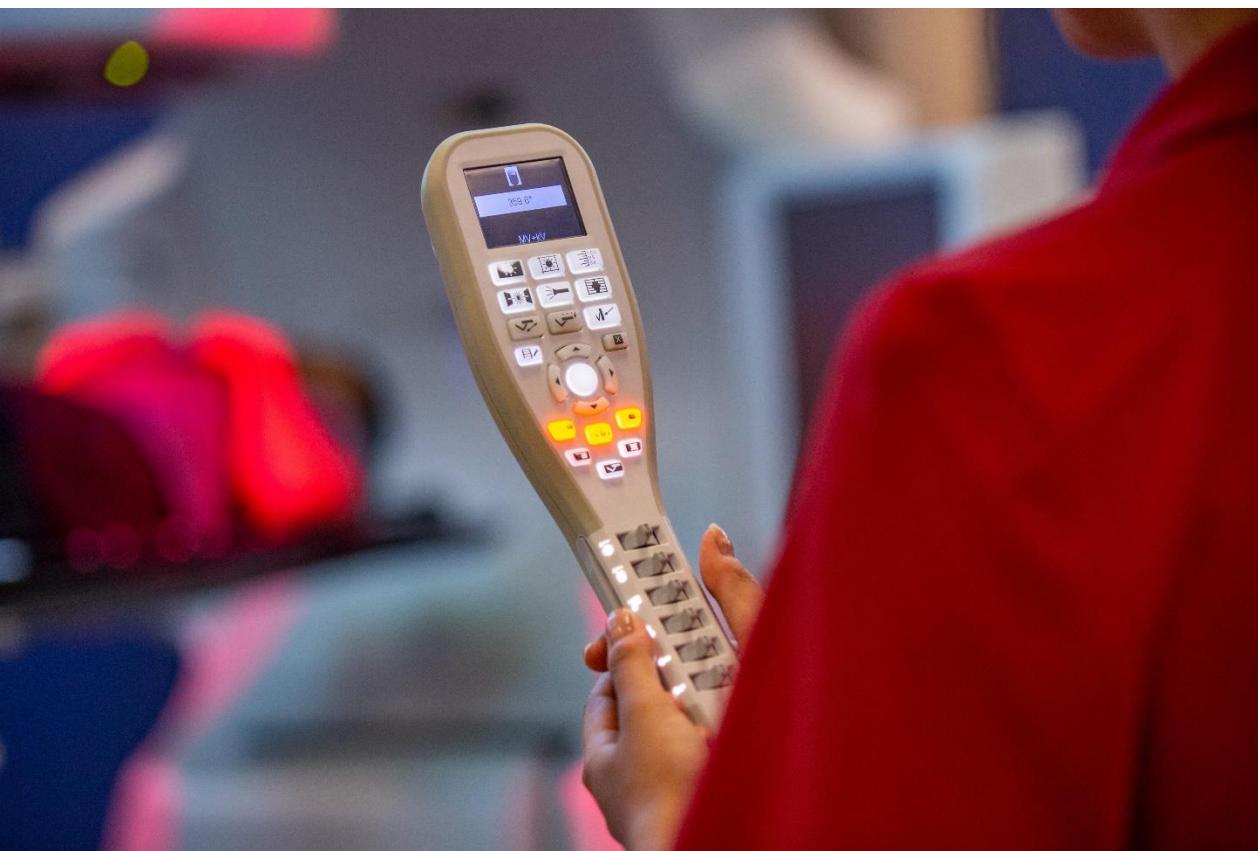


- Potential for improved department throughput
- Staff training critical for maximizing workflow efficiency

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Limitations:

- Staff inexperience may have increased session durations with OFM/SGRT
- Session times are now believed to be shorter
- Updated analysis will be conducted soon



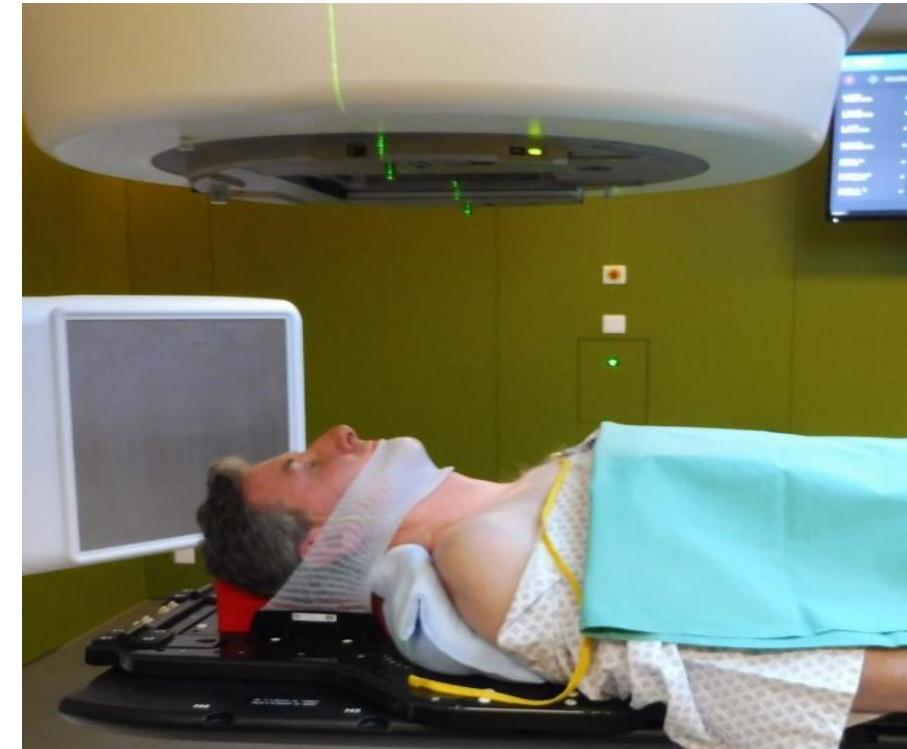
Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Treatment time of last 4 treated Patients SRT/AlignRT

Mask type	Number of sessions	Mean \pm SD (min)	Min – Max (min)
First session OFM/SGRT	4	21.9 \pm 3.6 Neu: 21.1 ± 1.7	14.3 - 29.6 18.2 - 22.7
Subsequent session - OFM/SGRT	18	16.9 \pm 2 .6 Neu: 15.4 ± 1.6	11.3 - 26.9 12.72 - 20.18

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Move from OFM to Chin Mask for HNO Patients



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Conclusion

- ✓ Shorter minimum treatment times → improved workflow efficiency
- ✓ Promising standard of care for brain SRT/SRS
- ✓ Enhances patient experience and comfort
- ✓ Allows more attention to patients during setup
- ✓ Reliable for both standard treatments and SRT/SRS/SBRT
- ✓ **SGRT is a powerful adjunct to stereotactic treatments, improving precision, safety, and comfort**



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Key Takeaways / Lessons learnt

You would NOT drive a car from A to B without a seatbelt because it removes a basic layer of safety. SGRT works the same way in RT — it adds that extra safety layer by checking the patient's position in real time.

Because safety is not an option when we have the choice to ensure it!



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Acknowledgments

Radio-Oncology Teams at **KSW & ZRR**

Alessandro Clivio – Statistical Analysis

RTT Team – for their dedication and support



Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

References

- Keane M, Weitkamp N, Madani I, et al. Randomized self-controlled study comparing open-face vs. closed immobilization masks in fractionated cranial radiotherapy. *Radiotherapy and Oncology*. 2024;196:110314. doi:10.1016/j.radonc.2024.110314.
- Malone C, Ryan S, Nicholson J, et al. Intrafraction motion stability of open vs. closed facemasks in head and neck radiotherapy: Insights from the OPEN Phase III Trial. *Radiotherapy and Oncology*. 2025;209:110941. doi:10.1016/j.radonc.2025.110941.
- Yang F, Li J, Li B, et al. Effectiveness of personalized open-face mask combined with Styrofoam fixation in radiotherapy treatment of head and neck cancers: A prospective randomized controlled trial. *Radiation Oncology (London, England)*. 2025;20(1):34. doi:10.1186/s13014-025-02609-8.
- Rudat V, Shi Y, Zhao R, Xu S, Yu W. Setup accuracy and margins for surface-guided radiotherapy (SGRT) of head, thorax, abdomen, and pelvic target volumes. *Scientific Reports*. 2023;13(1):17018. doi:10.1038/s41598-023-44320-2.
- Zhou S, Li J, Zhu X, et al. Initial clinical experience of surface guided stereotactic radiation therapy with open-face mask immobilization for improving setup accuracy: A retrospective study. *Radiation Oncology (London, England)*. 2022;17(1):104. doi:10.1186/s13014-022-02077-4.
- Lastrucci A, Morelli I, Votta C, et al. Open-face masks in radiotherapy: Enhancing therapeutic strategies for head and neck and brain cancer patients—a comprehensive scoping review. *Cancers*. 2024;16(16):2899. doi:10.3390/cancers16162899.

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

References

- Wiant D, Squire S, Liu H, Maurer J, Lane Hayes T, Sintay B. A prospective evaluation of open face masks for head and neck radiation therapy. *Pract Radiat Oncol.* 2016;6(6):e259–e267. doi:10.1016/j.prro.2016.02.003.
- Li G, et al. Clinical experience with two frameless stereotactic radiosurgery (fSRS) systems using optical surface imaging for motion monitoring. *J Appl Clin Med Phys.* 2015;16(4):149–162. doi:10.1120/jacmp.v16i4.5416.
- Lee SK, et al. Accuracy of surface-guided patient setup for conventional radiotherapy of brain and nasopharynx cancer. *J Appl Clin Med Phys.* 2021;22(5):48–57. doi:10.1002/acm2.13241.
- Gregucci F, et al. Brain Linac-Based Radiation Therapy: "Test Drive" of New Immobilization Solution and Surface Guided Radiation Therapy. *J Pers Med.* 2021;11(12). doi:10.3390/jpm11121351.
- Da Silva Mendes V, et al. ExacTrac Dynamic workflow evaluation: Combined surface optical/thermal imaging and X-ray positioning. *J Appl Clin Med Phys.* 2022;23(10):e13754. doi:10.1002/acm2.13754.
- Lundin E, Axelsson S, Ohlsson-Nevo E. Open or closed: Experience of head and neck radiotherapy masks - A mixed-methods study. *J Med Radiat Sci.* 2025;72(1):74–84. doi:10.1002/jmrs.825.
- Al-Hallaq HA, Cerviño L, Gutierrez AN, et al. AAPM Task Group Report 302: Surface-guided radiotherapy. *Medical Physics.* 2022;49(4):e82–e112. doi:10.1002/mp.15532.
- Hoisak JDP, Pawlicki T. The role of optical surface imaging systems in radiation therapy. *Seminars in Radiation Oncology.* 2018;28(3):185–193. doi:10.1016/j.semradonc.2018.02.003

Implementing SGRT for stereotactic treatments: Practical Steps for a Successful Start

Questions & Discussion

