

AAPM-TG302/ESTRO-ACROP SGRT GUIDELINES COMPLIANCE

alignrt®

AAPM-TG302/ESTRO-ACROP compliant **motion monitoring accuracy** at all couch/gantry angles and skin tones.

The most rigorous of the ESTRO-ACROP/AAPM-TG302 SGRT guidelines for SRS require a tracking accuracy of $\leq 0.5\text{mm}$ / $\leq 0.5^\circ$ in phantoms, including consideration for potential camera occlusions.

AlignRT delivers a tracking accuracy of $\leq 0.5\text{mm}$ / $\leq 0.2^\circ$ at all couch and gantry angles. AlignRT accuracy is not affected by skin tone.



TG302 Key Recommendations:

Accuracy:

Following TG-147 and TG142, the system accuracy should be $< 2\text{ mm}$, or $< 1\text{ mm}$ for SRS/SBRT procedures.

Registration Algorithm:

QA is **straightforward to implement and interpret for rigid registration algorithms**. Currently, **there are no known phantoms to enable rigorous testing of deformable algorithms**.

Beam Hold:

Recommendations: "Enable automatic beam hold when possible" for DIBH breast.

Skin Tone:

QA Test: Camera exposure settings are appropriate for a variety of skin tones.

AlignRT Compliance:

- AlignRT has published data showing sub-half mm accuracy for all couch/gantry configurations:
 - Covington et al, 2019: Vision RT (OSMS) vs. EPID (measured shifts at various couch angles for an anthropomorphic phantom with bb at isocenter located 8 cm below ROI): $< 0.5\text{ mm}$.
 - Sarkar, et al. 2018: Vision RT (OSMS) vs. CBCT, All Data (including couch rotations, and experimental setup shifts): $0.34 \pm 0.12\text{mm}$ MAG (mean \pm 1SD), $0.03 \pm 0.21^\circ$ rotations.
 - Wiant, et al. 2019: AlignRT vs ExacTrac, All Data (including couch rotations, different target locations and head orientations): $0.4 \pm 0.2\text{mm}$ MAG (mean \pm 1SD), $\leq 0.3 \pm 0.2^\circ$ rotations.
- AlignRT matches the ROI of live surface to reference surface, using rigid registration method (c.g. CBCT registrations).
- When you capture a new reference surface in AlignRT, the ROI automatically propagates to the new reference surface
- Beam Hold Integration/Connectivity with Elekta Response, Varian MMI, Hitachi and IBA Proteus Plus.
- It is essential that any SGRT system provides comparable performance over a wide range of skin tones.
- Covington et al 2020 demonstrates that AlignRT accuracy is not impacted by skin tone.



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AlignRT is AAPM-TG302/ESTRO-ACROP compliant, for all skin tones, couch and gantry angles, providing consistent, safe, and efficient **motion monitoring accuracy**.

This is especially important if you want to use your SGRT system for non-coplanar treatments and stereotactic applications.



ESTRO-ACROP Key Recommendations:

Accuracy:

Recommended $<1 \text{ mm} / 1^\circ$ end-to-end accuracy, or $<0.5 \text{ mm} / 0.5^\circ$ for SRS/SBRT procedures.

AlignRT Compliance:

AlignRT has published data showing sub-half mm accuracy for **all couch/gantry configurations**:

- Covington et al, 2019: Vision RT (OSMS) vs. EPID (measured shifts at various couch angles for an anthropomorphic phantom with bb at isocenter located 8 cm below ROI): $<0.5 \text{ mm}$.
- Sarkar, et al. 2018: Vision RT (OSMS) vs. CBCT, All Data (including couch rotations, and experimental setup shifts): $0.34 \pm 0.12 \text{ mm MAG (mean} \pm 1\text{SD)}$, $0.03 \pm 0.21^\circ$ rotations.
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"It is crucial that any SGRT system is compliant with guidelines and that the supporting published evidence matches how you plan to use the technology. At our center, we find that AlignRT is a valuable tool that helps ensure all treatments are delivered accurately, safely, and efficiently."



Dr. Vania Batista
Medical Physicist,
Heidelberg University Hospital

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