

PATIENT TRANSFER

CLINICAL PUBLICATION BRIEF

Automatic Planning Script for Volumetric-Modulated Arc Therapy Total Body Irradiation (VMAT-TBI)



FULL ARTICLE



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OBJECTIVE

Streamline the Volumetric-Modulated Arc Therapy Total Body Irradiation (VMAT-TBI) planning workflow by using an automated script to generate lower-body fields.

SUMMARY

This study developed and implemented an in-house Python script for the RayStation planning system to automate lower-body AP/PA IMRT field creation for VMAT-TBI. The script was used on five TBI patients, who were transferred using CQ Medical's **Alta™ AirShuttle™** and **AirDrive™ Caddie**, and immobilized with the **Alta Multipurpose Device system**.

The study compared the efficiency and efficacy of manual versus automated planning workflows for generating overlapping lower-body VMAT-TBI fields. By simplifying the planning of overlapping AP/PA IMRT fields, the script streamlines the entire TBI process.

CLINICAL IMPACTS

- The script significantly reduced lower body planning time from three hours to < 30 minutes.
- The script reduced manual complexities, consistently generating acceptable AP/PA IMRT fields with required feathering sub-fields, dose uniformity, and junction management.
- Reliable positioning, immobilization, and transfer devices enabled the VMAT-TBI workflow, helping achieve superior dose uniformity and lung sparing compared to traditional TBI methods.

KEY TAKEAWAYS

- 🕒 **EFFICIENCY** Automated script reduced lower body planning time by over 80%.
- ★ **EFFICACY** Script met all clinical goals for dose statistics: max dose <120%, V110% <10%, V100% >90%.
- ✓ **FEASIBILITY** Standardized immobilization and transfer devices enabled delivery of the required dose distribution for TBI with VMAT arcs to the whole body, all at an accessible cost.

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