10th International and 29th National Conference of Association of Radiation Therapists and Technologists of India

HYDERABAD

# ARTTICON 2025

Endorsed by ESTRO

12 - 14 September 2025

ARTTICON 2025 HYDERABAD

**Organized by:**
**Hyderabad Radiation Therapists and Technologists**

## TOTAL BODY IRRADIATION- A CHALLENGING EXPERIENCE

**Nirmit Dev Kumar**, Gurvinder Singh Wadhwan, Munish Gairola

**Rajiv Gandhi Cancer Hospital and Research Centre,** New Delhi

Nirmit.devkumar@yahoo.com

**Objectives:** The aim of this study was to audit translational setup errors in TBI patients treated with curative intent and evaluate the need for daily imaging.

**Material & Methods:** A total of 89 scans were analysed for 10 patients, of which 15 scans were analysed as per the weekly format. Scan were analysed and Mean displacements for the three directions (x, y and z) as per daily and weekly format were calculated. Translational displacements in medial-lateral (x), superior-inferior (y) and anterior-posterior (z) direction were documented according to daily and weekly IGRT schedule formats. Mean displacements, Systematic Errors (Ó), Random Errors (ó) and PTV margin using Van Herk formula (2.52 + 0.78) were calculated for both the formats. Image guidance was done using cone Tomotherapy unit.

**Results:** The difference between the displacements for the two formats were 0.059cm in medial-lateral, 0.353cm in superior-inferior and 0.076cm in anterior-posterior direction.

| I. | SYSTEMATIC ERRORS (cm) |
|---|---|
| | Daily errors weekly errors |
| X | 0.116 0.132 |
| Y | 0.233 0.108 |
| Z | 0.215 0.272 |

| II. | PTV MARGIN ERRORS (cm) |
|---|---|
| | Daily errors weekly errors |
| X | 0.433 0.492 |
| Y | 0.774 0.421 |
| Z | 0.485 0.561 |

**Conclusions:** The difference for the medial-la and anterior-posterior directions was less th 0.1cm; however the difference was 0.353cm superior-inferior direction. This is reflected in difference between the systematic errors for the formats, thus justifying the need for daily imag especially to overcome errors in superior-infer direction.

## BEYOND CANCER: BRACHYTHERAPY FOR POST-SURGICAL KELOID MANAGEMENT- A RTT STUDENT'S PERSPECTIVE.

**Nithyaa. A,** Dr. Bhuvaneswari. C, Pradeep Kumar. S, Dr. Madhumathi. S, Dr. Resmi. R.

**Government Royapettah Hospital,** Chennai

nithyaa0405@gmail.com

**Objective:** Brachytherapy is a precise radiotherap technique used in both malignant and selecte benign conditions. Its ability to target tissues wi minimal exposure to surrounding areas makes valuable beyond cancer care. One example is pos surg keloid management, where adjuva sur ould HDR brachytherapy improves loc co A keloid is a thick raised scar, due ex e fibroblast proliferation and collag dep n. It can occur wherever you have a sl inju but usually forms on earlobes, shoulde cheeks or the chest. Even though benign, it c cause cosmetic distress. Keloids are more prone recurrence, combining treatment such as excisio steroids or radiation significantly reduce recurrence risk. Radiation therapy should ideall delivered within 24-48 hours after surgical exci of a keloid to achieve the best outcomes minimize recurrence. Traditional treatm (Steroid injection, surgery) shows limited suc while adjuvant brachytherapy improves l control by inhibiting fibroblast activity collagen synthesis. This case study reflects ke management and its clinical value from an student's perspective.

# ARTIFICIAL INTELLIGENCE IN RADIOTHERAPY: ENHANCING PRECISION AND PERSONALIZATION IN CANCER TREATMENT

**Anisha Kathait, Mayank**
**Rajiv Gandhi Cancer Institute and Research Centre**
anishakathait0@gamil.com

**Objective:** To evaluate the impact of Artificial Intelligence (AI) integration in radiotherapy workflows, focusing on improvements in contouring accuracy, time efficiency, and predictive analytics for patient outcomes

**Materials and Methods:** A comprehensive analysis was conducted using data from multiple peer-reviewed studies and clinical trials that implemented AI-assisted tools in radiotherapy. Key performance metrics included:

- **Dice Similarity Coefficient (DSC):** Assessing contouring accuracy.
- **Mean Distance to Agreement (MDA):** Evaluating spatial agreement between contours.
- **Time Efficiency:** Measuring reduction in contouring time.
- **Predictive Accuracy:** Evaluating AI's ability to predict treatment side-effects.

Data were synthesized from studies focusing on various cancer types, including lung, prostate, and breast cancers. The analysis involved comparing traditional manual radiotherapy planning methods with AI-assisted approaches across multiple institutions. Metrics were extracted and tabulated to highlight differences in performance. Additionally, graphical representations were created to visualize improvements in efficiency and accuracy.

**Results:**

| Parameter | Traditional Approach | AI-Assisted Approach | Improvement |
|---|---|---|---|
| Contour Delineation Time (Head & Neck) | 97 minutes | 4.4–9.8 minutes | Up to 95% time reduction |
| CTV Delineation Accuracy (DSC Score) | 0.703 | 0.745 | Significant accuracy enhancement |
| Prostate Cancer Detection Accuracy accuracy | 67% | 84% | 17% increase in detection |
| Treatment Planning Acceptance Rate | Variable | 90–95% | High consistency and efficiency |
| Side-Effect Prediction Accuracy (Breast Cancer) | Limited | 73.4% | Enhanced predictive capability |

**Graphical Representation:**

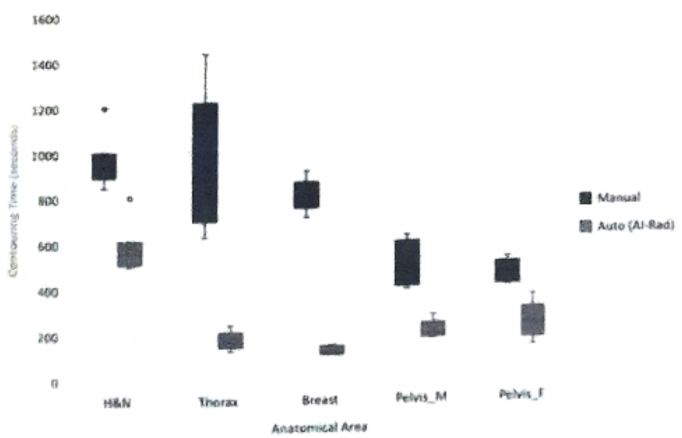


*Figure 1: Comparative Analysis of Manual vs. AI-Assisted Radiotherapy Planning*

***Note:*** The above figure illustrates the significant improvements in contouring accuracy and time efficiency achieved through AI integration.

**Conclusion:** The integration of AI into radiotherapy workflows significantly enhances contouring accuracy, reduces planning time, and improves the prediction of treatment side-effects. These advancements contribute to more personalized and effective cancer treatments. However, challenges such as data privacy, model transparency, and clinical validation need to be addressed to fully realize AI's potential in clinical settings

**Conclusion:**

Artificial Intelligence holds metamorphic potential for radiation therapy, especially in a developing country like India, where medical resources are limited and cancer care demands are rising. AI enhances treatment precision, workflow efficiency and personalized care, making it an unpriced tool in cancer centre. For radiation therapists, it reduces manual workload, supports clinical decisions, and opens path for skill advancement. As India advances in healthcare innovation, integrating AI responsibly and inclusively will be essential to improve cancer treatment outcomes and empower radiation therapy professionals across both public and private sectors.

**Keywords:** RTT s(radiation therapists) and AI (artificial intelligence).

**Reference:**


1. Cox, J., Thomas, R., & Brown, E.(2021). Radiation Therapists' perceptions and use of artificial intelligence in clinical practice: A national survey. Journal of Medical Radiation Sciences, 68(3), 279-287. https://doi.org/10.1002/jmrs.638
2. Wong, K., Gallant , F., & Szumachar , E .(2021).Perceptions of Canadian Radiation therapist and radiation physicists,radiation therapists and radiation trainees about the impact of artificial intelligence in radiation oncology -National survey. Journal of Medical Imaging and radiation Sciences,52(1), 44-48 https://doi.org/10.1016/j.jmir.2020.11.013
3. Thompson RF, Valdes G,Fuller CD,Carpenter CM,Morin O, Aniya s, Lindsay DJ ,Klevin OJ,Lujan BJ, Tannenbaun A, Yu JB.Artifical Intelligence in Radiation Oncology:A specialty-wide.disruptive Transformation? Radiotherapy and oncology 2018 sept;129(3):421-426 https://doi.org/10.10116/j.radoc.2018.05.030


## RADIOTHERAPY CHALLENGES AND ADVANCEMENTS IN CNS TUMORS

**Reva Aashi, Aniket**

**Rajiv Gandhi Cancer Hospital and Research Centre,** New Delhi

revaaashi07@gmail.com

**Objective:** To review the clinical and technical challenges associated with radiotherapy for central nervous system (CNS) tumors and highlight recent advancements that enhance treatment precision, safety, and patient outcomes.

**Materials and Methods:** This study involved a review of published clinical data, multi-institutional trials, and recent innovations in radiotherapy techniques used for CNS tumors such as gliomas, medulloblastomas, and brain metastases. Key areas of focus included:

- Tumor localization and imaging (MRI, PET, functional imaging)
- Radiotherapy modalities (IMRT, SRS, proton therapy)
- Neurocognitive preservation strategies
- AI and adaptive planning

**Results:**

| **Challenges** | **Traditional Limitation** | **Advancement** | **Impact** |
|---|---|---|---|
| Tumor Localization | Limited soft-tissue contrast on CT | MRI-based planning, fMRI, PET fusion | Improved target accuracy |
| Dose Distribution | Risk of damaging healthy brain tissue | IMRT, VMAT, Proton Therapy | Better conformity, lower toxicity |