


ESTRO 2026 AMEND CONTINUE

## Submission ID

1579

## Author approval (read-only)

I confirm that this abstract has been approved by all authors.

## Accuracy of the abstract (read-only)

I accept responsibility for the accuracy of the abstract. I understand that no changes to the abstract text are possible after the submission deadline of 12 November 2025 (23h59 CET).

## Author list (read-only)

I confirm that all authors contributing to the abstract are properly included in the author list. I understand that no changes to the author list are possible after the 1 February 2026.

## Abstract presentation (read-only)

I certify that, if the abstract is selected, the information reported is for the exclusive presentation in the scientific programme and will not be presented at any commercially-sponsored satellite symposia during the congress.

register to attend and present at the congress.

## Embargo of abstracts (read-only)

I understand that abstracts are embargoed until 1 month prior to the congress at which point abstracts are published in the abstract book and online searchable programme. Should you wish for an abstract to be embargoed until the congress, please email abstracts@estro.org by 28 February 2026.

## Abstract verification (read-only)

I accept to check the abstract overview provided in the submission confirmation email and ensure all abstract details are correct.

## Contact person (read-only)

I accept to be the contact person for all correspondence related to the abstract and to share relevant information with the co-authors.

## Topic (read-only)

Physics: Dose prediction/calculation, optimisation and applications for photon and electron planning

## Keywords (read-only)

auto-planning, prostate cancer

## Radiotherapy & Oncology (the Green Journal) and The Lancet Oncology are once again joining forces for ESTRO 2026. The top research submitted for the congress will be featured in a special Green Journal - The Lancet Oncology joint session and could be published in either journal.

☐ I want this abstract to be considered for this initiative.

## Abstract title (read-only)

## Authors and affiliations (required)

*Pauline Maury (Presenting) pauline.maury@gustaveroussy.fr*
Radiation Oncology Department, Institute Gustave Roussy, Villejuif, France

*Willliam Green william.green2@pennmedicine.upenn.edu*
Radiation Oncology Department, University of Pennsylvania, Philadelphia, USA

*Rafe McBeth rafe.mcbeth@pennmedicine.upenn.edu*
Radiation Oncology Department, University of Pennsylvania, Philadelphia, USA

*Enis Ozyar enis.ozyar@acibadem.com*
Radiation Oncology Department, Acibadem MAA University School of Medicine, Istanbul, Turkey

*Gorkem Gungor gorkem.gungor@acibadem.com*
Radiation Oncology Department, Acibadem MAA University School of Medicine, Istanbul, Turkey

*Madalina-Liana Costea m.costea@therapanace.com*
Clinical Affairs, TheraPanacea, Paris, France

*Baris Ungun b.ungun@therapanacea.eu*
Physics, TheraPanacea, Paris, France

*Remi Vauclin r.vauclin@therapanacea.com*
Physics, TheraPanacea, Paris, France

*Elie Mengin e.mengin@therapanacea.com*
Physics, TheraPanacea, Paris, France

*Nikos Paragios n.paragios@therapanacea.com*
CEO, TheraPanacea, Paris, France

*Mario Terlizzi mario.terlizzi@gustaveroussy.fr*
Radiation Oncology Department, Institute Gustave Roussy, Villejuif, France

## Purpose/Objective (read-only)

Ultra-hypofractionated radiotherapy is an established treatment for localized prostate cancer [1]. This study aimed to clinically validate an automated planning (AP) pipeline combining deep learning-based dose prediction with dose mimicking to efficiently generate high-quality, clinically acceptable VMAT plans.

## Material/Methods (read-only)

The AP workflow was trained on 138 manually generated VMAT plans (dose prescription: 36.25 Gy in 5 fractions). Clinical validation was conducted on 20 patients from two European centers. Using planning CTs and validated target and OAR contours, the AP pipeline automatically

A quantitative comparison between AP and manual plans (MP) was done following GETUG recommendations [1], with all AP plans normalized to 100% CTV coverage. Statistical analysis was performed using the Wilcoxon rank test. Three senior radiation oncologists (two European, one US) performed independent qualitative evaluation, with freedom to adjust normalization and assess overall clinical acceptability. A subset of cases underwent patient-specific QA to confirm deliverability.

## Results (read-only)

The full AP process required approximately 10 minutes, including dose calculations. With an additional ~10 minutes for physician review, clinically ready plans were available within ~20 minutes. AP plans demonstrated superior target coverage compared to MPs (Table 1), achieving CTV coverage in 20/20 cases versus 9/20 for MPs ($p<0.001$). MPs showed slightly improved rectum D1cc performance (criteria met in 11/20 vs 1/20, $p<0.0001$). After normalization adjustments, all AP plans except one (minor sigmoid deviation) were considered clinically acceptable. The mean normalization adjustment was 2.9±1.9%, balancing CTV coverage and rectal sparing. Suboptimal bladder or rectum preparation was noted in three cases but did not compromise plan quality. Patient-specific QA confirmed excellent deliverability, with gamma pass rates above 99% (3%/2mm).

| Structure | Dose criteria | Manual Plans (mean + SD) | SmartPlan Plans (mean + SD) |
|---|---|---|---|
| **PTV** | D95% ≥ 34.4 Gy | 35.48 ± 0.49 | 36.77 ± 0.18 * |
| | Dmax ≤ 120 % | 37.93 ± 1.02 | 38.95 ± 0.71 |
| **CTV** | D99% ≥ 36.25 Gy | 35.98 ± 0.67 | 38.95 ± 0.71 * |
| **Rectum** | D50% < 8.1 Gy | 9.49 ± 2.62 | 10.22 ± 1.69 |
| | D20% < 29 Gy | 19.19 ± 3.11 | 18.96 ± 2.7 |
| | D1cc < 36.00 Gy | 35.63 ± 0.67 | 37.41 ± 0.93 * |
| **Bladder** | D40% < 18.1 Gy | 5.1 ± 4.2 | 6.59 ± 5.01 * |
| | D10% < 36.25Gy | 20.68 ± 6.68 | 22.32 ± 7.37 |
| **Left Femoral Head** | D5% < 14.5 Gy | 11.74 ± 1.52 | 11.96 ± 1.72 |
| **Right Femoral Head** | D5% < 14.5 Gy | 11.87 ± 1.49 | 11.71 ± 1.55 |

Table 1. Quantitative results Manual vs AutoPlan doses; with * are marked the statistically significant differences

generation for ultra-hypofractionated prostate radiotherapy across different TPS and linac models. Integration of MRI-based urethral delineation is expected to further enhance OAR sparing. These results support clinical implementation and further expansion to additional platforms such as Halcyon machine.

## References (read-only)

[1] Lapierre, Ariane et al. “Highly hypofractionated schedules for localized prostate cancer: Recommendations of the GETUG radiation oncology group.” Critical reviews in oncology/hematology vol. 173 (2022): 103661. doi:10.1016/j.critrevonc.2022.103661

## Conflict of Interest Disclosure (read-only)

- (●) I do not have a Conflict of Interest to disclose.
- ( ) I do have a Conflict of Interest to disclose.

## Permission to publish (required)

In submitting this abstract, you give ESTRO permission to publish it in the congress abstract book, a supplement to the Green Journal and online in various forms (searchable programme, media library, congress platform and others).

powered by Oxford Abstracts