

PROSTATE CANCER TREATMENT AND PSMA PET IMAGING:

PATTERNS OF CARE AT THE JUNE E. NYLEN CANCER CENTER

LISA CHAIKEN, MD

ASSISTANT PROFESSOR OF RADIATION ONCOLOGY

DISCLOSURES

I HAVE NO CONFLICTS OF
INTEREST TO DISCLOSE



JUNE E. NYLEN CANCER CENTER SIOUX CITY, IOWA



 June E. Nylen
CANCER CENTER

About June E. Nylen Cancer Center

- **Joint Venture** Outpatient Center in Sioux City
- **15 Counties** in Iowa, Nebraska & South Dakota
- **3 Hematology/Medical Oncology Physicians** (Recruiting)
- **2 Radiation Oncologists**
- **2 Nurse Practitioners** (Recruiting)
- **100+** Total Employees
- **30** New Patients Referred Weekly
- **6,083** Patients Cared For Last Year
- **39,426** Patient Visits Last Year



PSMA PET IMAGING

PROSTATE SPECIFIC MEMBRANE ANTIGEN

**ONLY COMMUNITY CENTER TO OFFER THIS
IMAGING**

**OTHER OPTION IS FOR PATIENTS TO TRAVEL TO
SIOUX FALLS OR OMAHA**

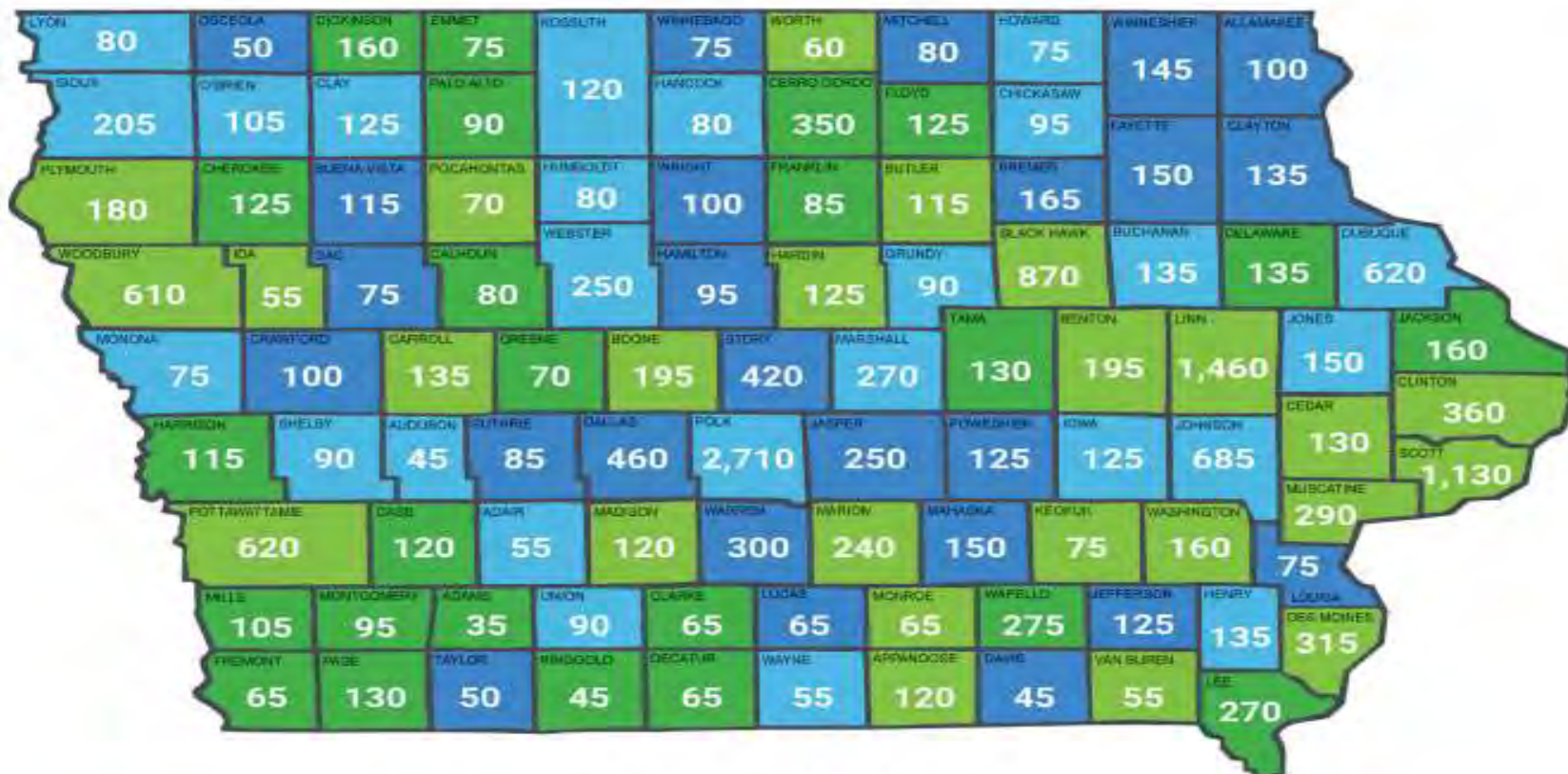
**CHANGED PATTERNS OF SPREAD FOR PROSTATE
CANCER**

**OPENED UP NEW TREATMENT MODALITIES SUCH AS
PLUVICTO**

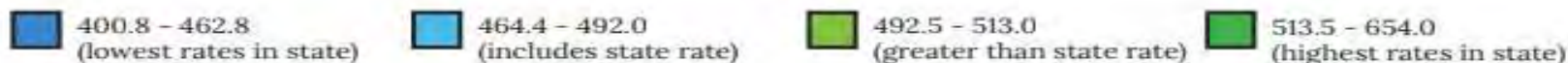


Estimates for New Cancers for 2023

The numbers on the map below are estimates of the 20,800 new cancer cases for 2023 by county of residence at diagnosis. The color of the county shows the rate of new cancer cases for years 2015-2019, with the counties with the lowest rates shaded **dark blue** and the highest rates shaded **dark green**.



Iowa Rate: 485.9 / per 100,000



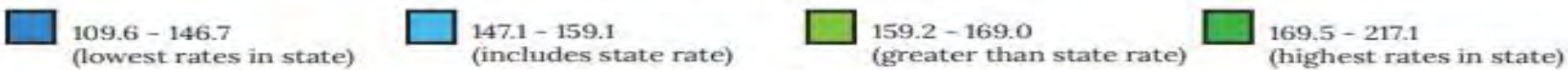
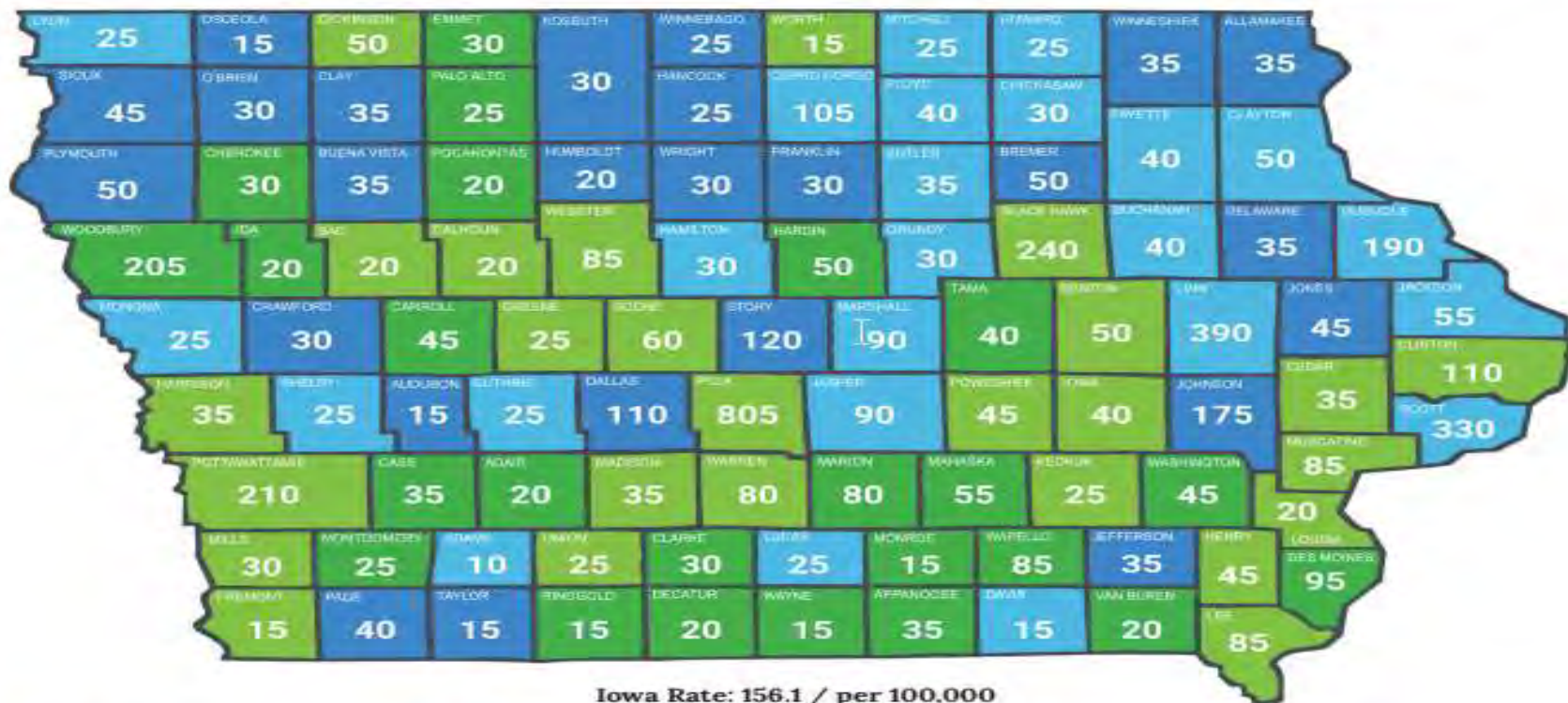
Rates are age-adjusted to the 2000 U.S. Standard Million Population, 2015-2019

ESTIMATED NEW CANCERS AMONG IOWA RESIDENTS, 2023

TYPE	COUNT	% OF TOTAL	TYPE	COUNT	% OF TOTAL
Breast	2,920	14.0	Leukemia	720	3.5
Prostate	2,750	13.2	Uterus	700	3.4

Estimates for Cancer Deaths for 2023

The numbers on the map below are estimates of the 6,200 cancer deaths estimated for 2023 by county of residence at time of death. These projections are based on mortality data provided by the Iowa Department of Health and Human Services. The color of the county shows the rate of cancer deaths for years 2015-2019, with the counties with the lowest rates shaded **dark blue** and the highest rates shaded **dark green**.



Rates are age-adjusted to the 2000 U.S. Standard Million Population, 2015-2019

ESTIMATED CANCER DEATHS AMONG IOWA RESIDENTS, 2023

TYPE	COUNT	% OF TOTAL	TYPE	COUNT	% OF TOTAL
Lung	1,420	22.9	Bladder	190	3.1
Colon and rectum	540	8.7	Brain	180	2.9
Pancreas	470	7.6	Esophagus	180	2.9
Breast	410	6.6	Kidney and renal pelvis	180	2.9
Prostate	340	5.5	Ovary	150	2.4

IOWA DATA 2019-2021

COURTESY OF AMANDA KAHL, MPH, RESEARCH SPECIALIST
IOWA CANCER REGISTRY

		N	%
Total		8,008	
Gleason Score	Gleason score 6 or less	1,780	22%
	Gleason score 7	3,700	46%
	Gleason score 8	768	10%
	Gleason score 9	1,115	14%
	Gleason score 10	109	1%
	Unknown	536	7%
Surgery	Received surgery	3,260	41%
	No/Unknown	4,748	59%
Radiation	Received radiation	2,235	28%
	No/Unknown	5,773	72%
Both surgery and radiation	Surgery Only	3,030	38%
	No surgery or radiation	2,743	34%
	Radiation Only	2,005	25%
	Surgery & Radiation	230	3%
Stage	Localized	6,033	75%
	Regional	1,191	15%
	Distant	709	9%
	Unknown/unstaged	75	1%

JENCC STATISTICS

119 PATIENTS WITH PROSTATE CANCER
WERE SEEN AND TREATED IN THE
DEPARTMENT 2/1/2023 until 8/1/2024

88 PRIMARY PROSTATE PATIENTS

31 POST PROSTATECTOMY PATIENTS



GLEASON SCORES

GLEASON 6 (3+3) 6 % (7)

GLEASON 7 (3+4) 34% (41)

GLEASON 7 (4+3) 27% (32)

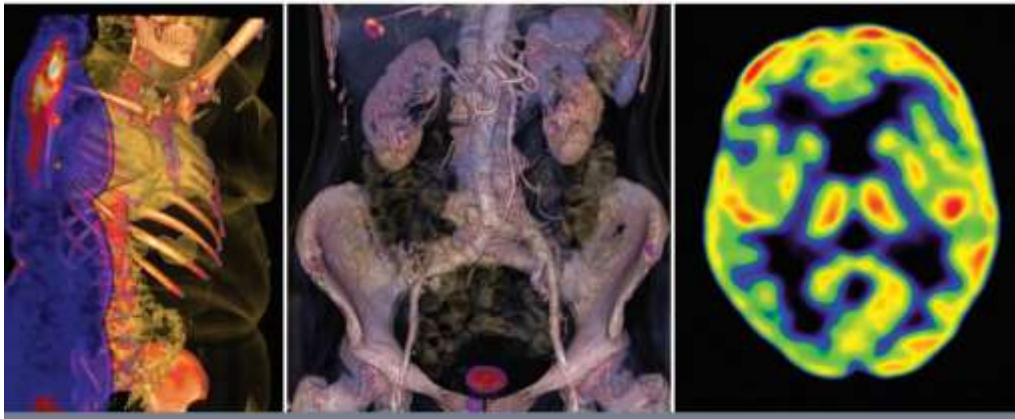
GLEASON 8 (4+4) 11% (13)

GLEASON 9 (4+5) 22% (26)



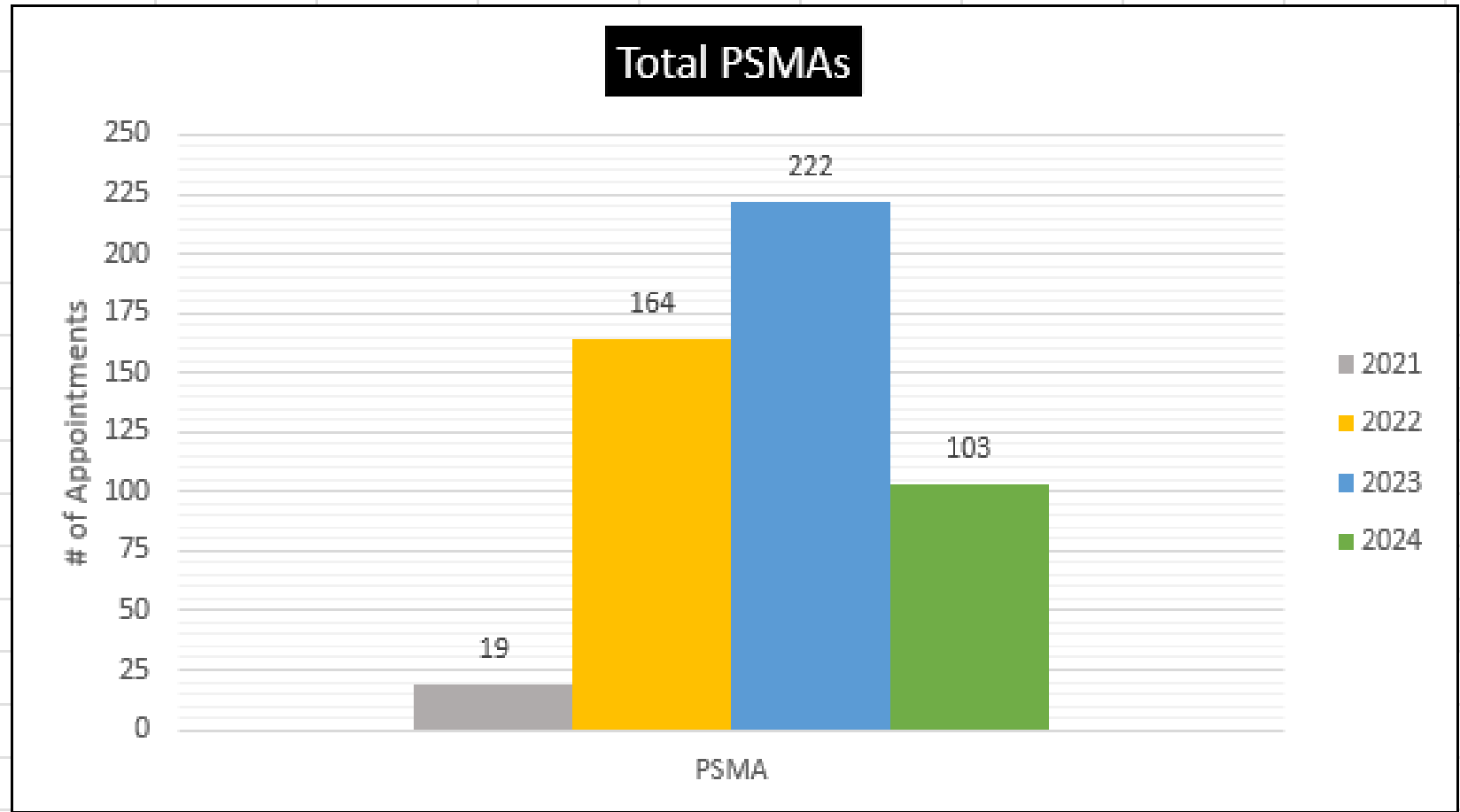
NEW STATE-OF-THE-ART PET SCANNER AT JENCC

- Enhanced Image Quality
- Increased Speed and Less Radiation
- Improved Patient Comfort
- Additional Scanning Options



**A \$2.9 Million
Project**

PSMA PET HISTORY AT JENCC



Diagnostic Performance of ^{18}F -DCFPyL-PET/CT in Men with Biochemically Recurrent Prostate Cancer: Results from the CONDOR Phase III, Multicenter Study

Michael J Morris ^{# 1}, Steven P Rowe ^{# 2}, Michael A Gorin ³, Lawrence Saperstein ⁴, Frédéric Pouliot ⁵, David Josephson ⁶, Jeffrey Y C Wong ⁷, Austin R Pantel ⁸, Steve Y Cho ⁹, Kenneth L Gage ¹⁰, Morand Piert ¹¹, Andrei Iagaru ¹², Janet H Pollard ¹³, Vivien Wong ¹⁴, Jessica Jensen ¹⁴, Tess Lin ¹⁴, Nancy Stambler ¹⁴, Peter R Carroll ¹⁵, Barry A Siegel;
CONDOR Study Group

Collaborators, Affiliations

Collaborators

CONDOR Study Group: Michael Morris ¹, Andreas Wibmer ¹, Jeremy Durack ¹,

CONDOR RESULTS

Results: A total of 208 men with a median baseline PSA of 0.8 ng/mL (range: 0.2-98.4 ng/mL) underwent ^{18}F -DCFPyL-PET/CT. The CLR was 84.8%-87.0% (lower bound of 95% CI: 77.8-80.4). A total of 63.9% of evaluable patients had a change in intended management after ^{18}F -DCFPyL-PET/CT. The disease detection rate was 59% to 66% (at least one lesion detected per patient by ^{18}F -DCFPyL-PET/CT by central readers).

Conclusions: Performance of ^{18}F -DCFPyL-PET/CT achieved the study's primary endpoint, demonstrating disease localization in the setting of negative standard imaging and providing clinically meaningful and actionable information. These data further support the utility of ^{18}F -DCFPyL-PET/CT to localize disease in men with recurrent prostate cancer. *See related commentary by True and Chen, p. 3512.*



PSMA RESULTS

Post Prostatectomy

› Eur J Nucl Med Mol Imaging. 2017 Sep;44(10):1656-1662. doi: 10.1007/s00259-017-3746-9.
Epub 2017 Jun 23.

Patterns of failure after radical prostatectomy in prostate cancer – implications for radiation therapy planning after ^{68}Ga -PSMA-PET imaging

Kilian Schiller¹, K Sauter², S Dewes², M Eiber^{3 4}, T Maurer⁵, J Gschwend⁵, S E Combs^{2 6},
G Habl^{2 6}

Affiliations:

Affiliations

1 Department of Radiation Oncology, Technical University of Munich (TUM), Ismaninger Strasse 22, 81675, Munich, Germany. kilian.schiller@mri.tum.de.



PSMA RESULTS

Post Prostatectomy



Results: Compared to negative conventional imaging (CT/MRI), lesions suspicious for PC were detected in 27/31 cases (87.1%) by ^{68}Ga -PSMA-PET imaging, which resulted in changes to the radiation concept. There were 16/31 patients (51.6%) that received a simultaneous integrated boost (SIB) to a subarea of the prostate bed (in only three cases this dose escalation would have been planned without the additional knowledge of ^{68}Ga -PSMA-PET imaging) and 18/31 (58.1%) to uncommon (namely presacral, paravesical, pararectal, preacetabular and obturatoric) LN sites. Furthermore, 14 patients (45.2%) had a changed TNM staging result by means of ^{68}Ga -PSMA-PET imaging.

Conclusion: Compared to conventional CT or MRI staging, ^{68}Ga -PSMA-PET imaging detects more PC lesions and, thus, significantly influences radiation planning in recurrent prostate cancer patients enabling individually tailored treatment.



PSMA RESULTS UCLA

[J Nucl Med.](#) 2018 Nov; 59(11): 1714–1721.

PMCID: [PMC6225538](#)

doi: [10.2967/jnumed.118.209387](#)

PMID: [29653978](#)

Potential Impact of ^{68}Ga -PSMA-11 PET/CT on the Planning of Definitive Radiation Therapy for Prostate Cancer

[Jeremie Calais](#),¹ [Amar U. Kishan](#),² [Minsong Cao](#),² [Wolfgang P. Fendler](#),^{1,3} [Matthias Eiber](#),¹ [Ken Herrmann](#),^{1,3}
[Francesco Ceci](#),¹ [Robert E. Reiter](#),⁴ [Matthew B. Rettig](#),⁴ [John V. Hegde](#),² [Narek Shaverdian](#),² [Chris R. King](#),²
[Michael L. Steinberg](#),² [Johannes Czernin](#),¹ and [Nicholas G. Nickols](#)^{2,4,5}

[▶ Author information](#) ▶ [Article notes](#) ▶ [Copyright and License information](#) [PMC Disclaimer](#)

Received 2018 Feb 6; Accepted 2018 Mar 23.

PSMA RESULTS UCLA

considered to have a major potential impact on treatment planning. **Results:** All patients had one or more ^{68}Ga -PSMA-11-positive primary prostate lesions. Twenty-five (34%) and 7 (9.5%) of the 73 patients had ^{68}Ga -PSMA-11-positive pelvic LN and distant metastases, respectively. The sites of LN metastases in decreasing order of frequency were external iliac (20.5%), common iliac (13.5%), internal iliac (12.5%) obturator (12.5%), perirectal (4%), abdominal (4%), upper diaphragm (4%), and presacral (1.5%). The median size of the LN lesions was 6 mm (range, 4-24 mm). RT planning based on the CTVs covered 69 (94.5%) of the 73 primary lesions and 20 (80%) of the 25 pelvic LN lesions, on a per-patient analysis. **Conclusion:** ^{68}Ga -PSMA-11 PET/CT had a major impact on intended definitive RT planning for PCa in 12 (16.5%) of the 73 patients whose RT fields covered the prostate, seminal vesicles, and pelvic LNs and in 25 (37%) of the 66 patients whose RT fields covered the prostate and seminal vesicles but not the pelvic LNs.

JENCC STATISTICS

119 PATIENTS WITH PROSTATE CANCER
WERE SEEN AND TREATED IN THE
DEPARTMENT 2/1/2023 until 8/1/2024

88 PRIMARY PROSTATE PATIENTS

31 POST PROSTATECTOMY PATIENTS

GLEASON 6 (3+3) 6 % (7)

GLEASON 7 (3+4) 34% (41)

GLEASON 7 (4+3) 27% (32)

GLEASON 8 (4+4) 11% (13)

GLEASON 9 (4+5) 22% (26)



JENCC STATISTICS

PSA WAS PREDOMINANTLY UNDER OR EQUAL TO 10 82% (98 PATIENTS)

PSA 10-20 13% (15 PATIENTS)

PSA 20-30 2% (2 PATIENTS)

PSA 30-40 3% (3 PATIENTS)

PSA OVER 50 1% (1 PATIENT)



JENCC STATISTICS

STAGING

MAJORITY STAGE I/II 83% (99 PATIENTS)

STAGE IIIA 2% (2)

STAGE IIIB 1% (1)

STAGE IVA 11% (13 PATIENTS)

STAGE IVB 3% (4 PATIENTS)



JENCC STATISTICS INTACT GLAND

54 (61%) PATIENTS DID NOT HAVE A PSMA FOR STAGING.

34 PATIENTS HAD PSMA SCANS

25 PATIENTS (74%) DID NOT HAVE ACTIVITY BEYOND THE PROSTATE GLAND



PSMA RESULTS INTACT GLAND

9 PATIENTS (26%) HAD POSITIVE FINDINGS

CHANGED MANAGEMENT AND UPSTAGED
DISEASE:

OLIGO BONE METS, 2 PATIENTS

LYMPH NODES, 4 PATIENTS

SEM VES, 2 PATIENTS

A COMBINATION (ALL THREE-1 PT)



JENCC STATISTICS

FOR POST PROSTATECTOMY PATIENTS

ONLY 3 PATIENTS (10%) DID NOT HAVE PSMA TESTS

28 PATIENTS HAD PSMA TEST

6 PATIENTS (21%) HAD NEGATIVE PSMA TESTS



POST PROSTATECTOMY PSMA RESULTS JENCC

22/28 PATIENTS (79%) HAD
TREATMENT MODIFICATIONS

LN ONLY 9 PATIENTS (32%)

PROST BED ONLY 5 PATIENTS (18%)

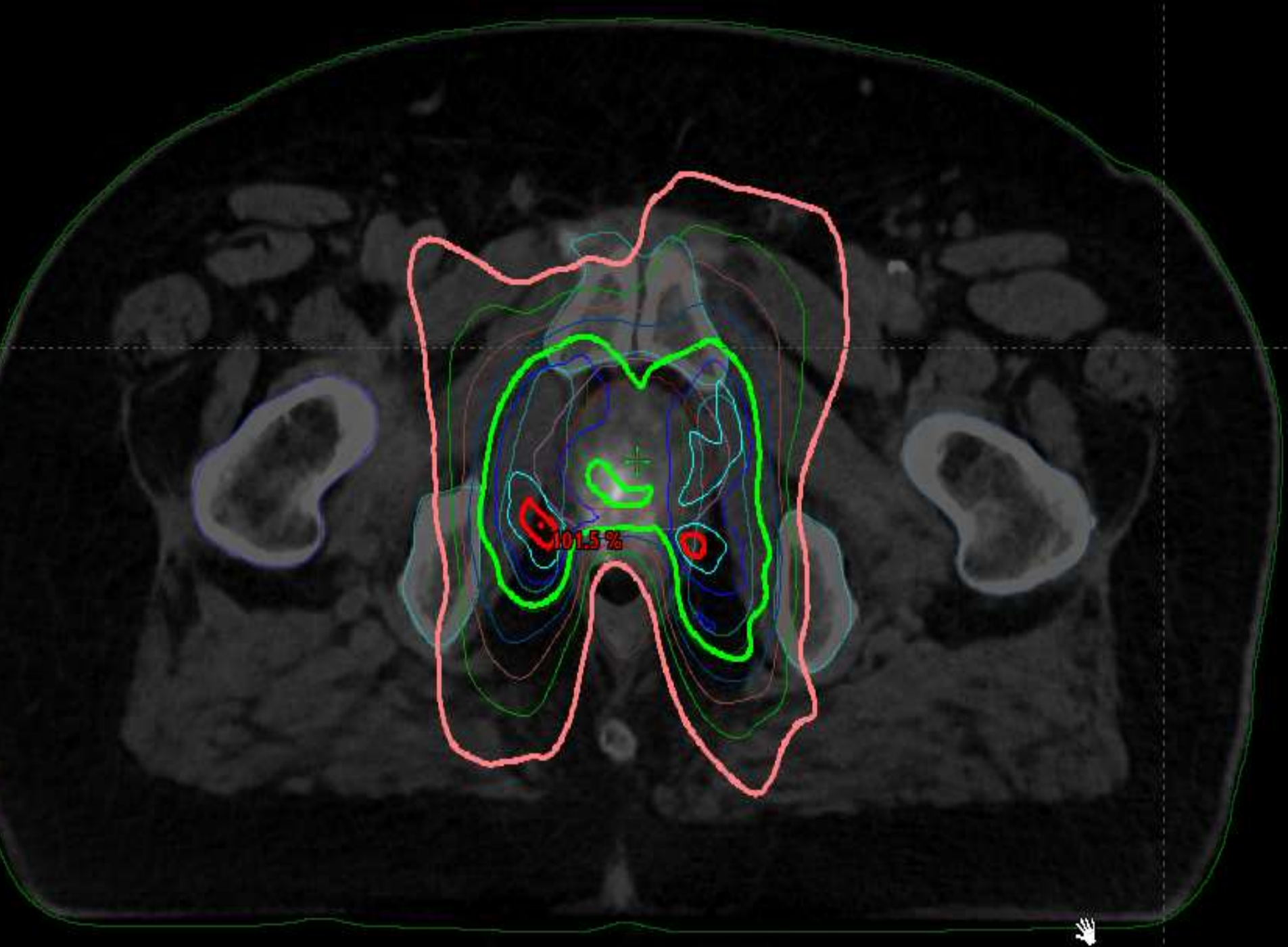
PROST BED AND LN 3 PATIENTS (11%)

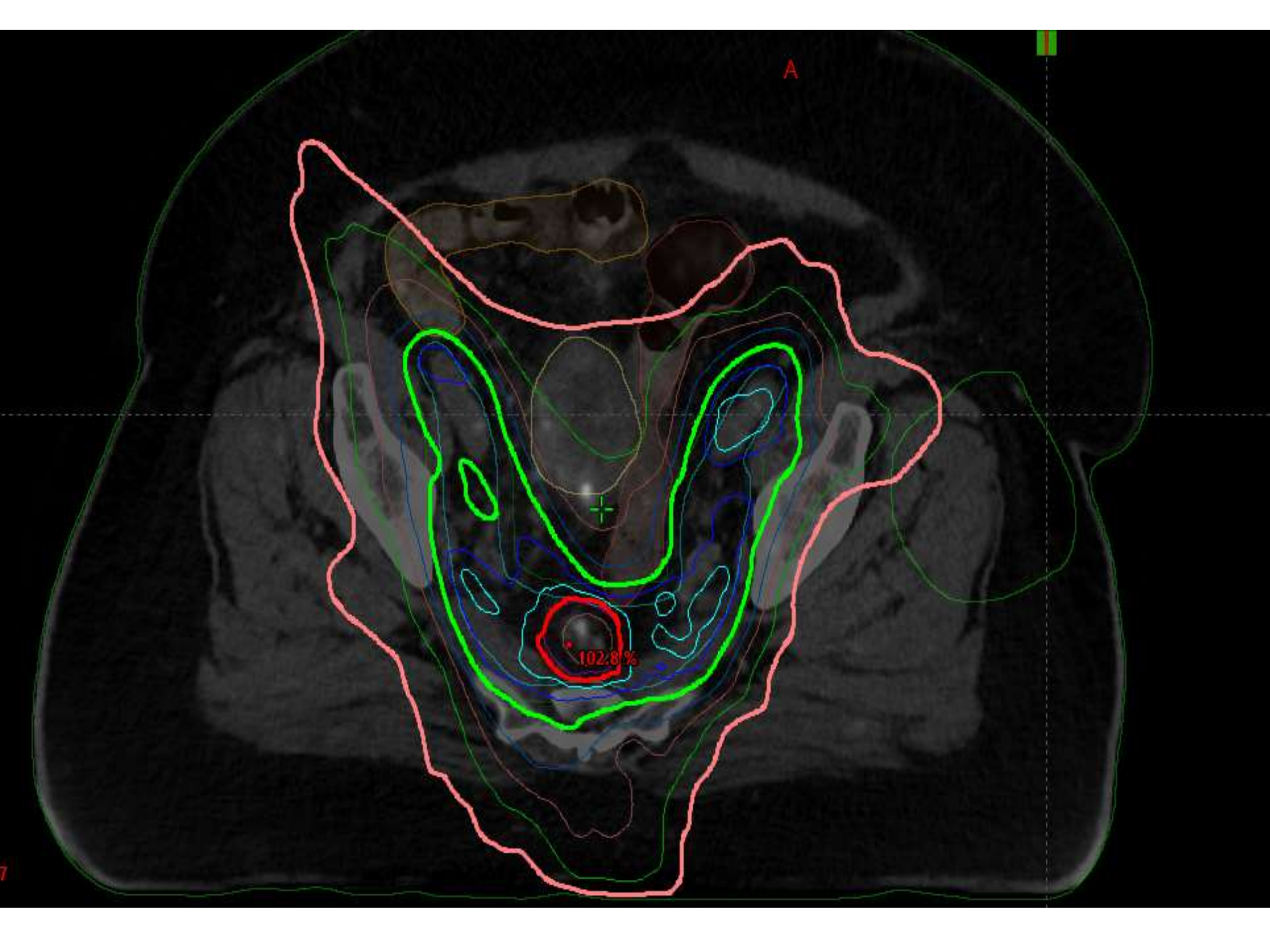
BONE ONLY 1 PATIENT (4%)

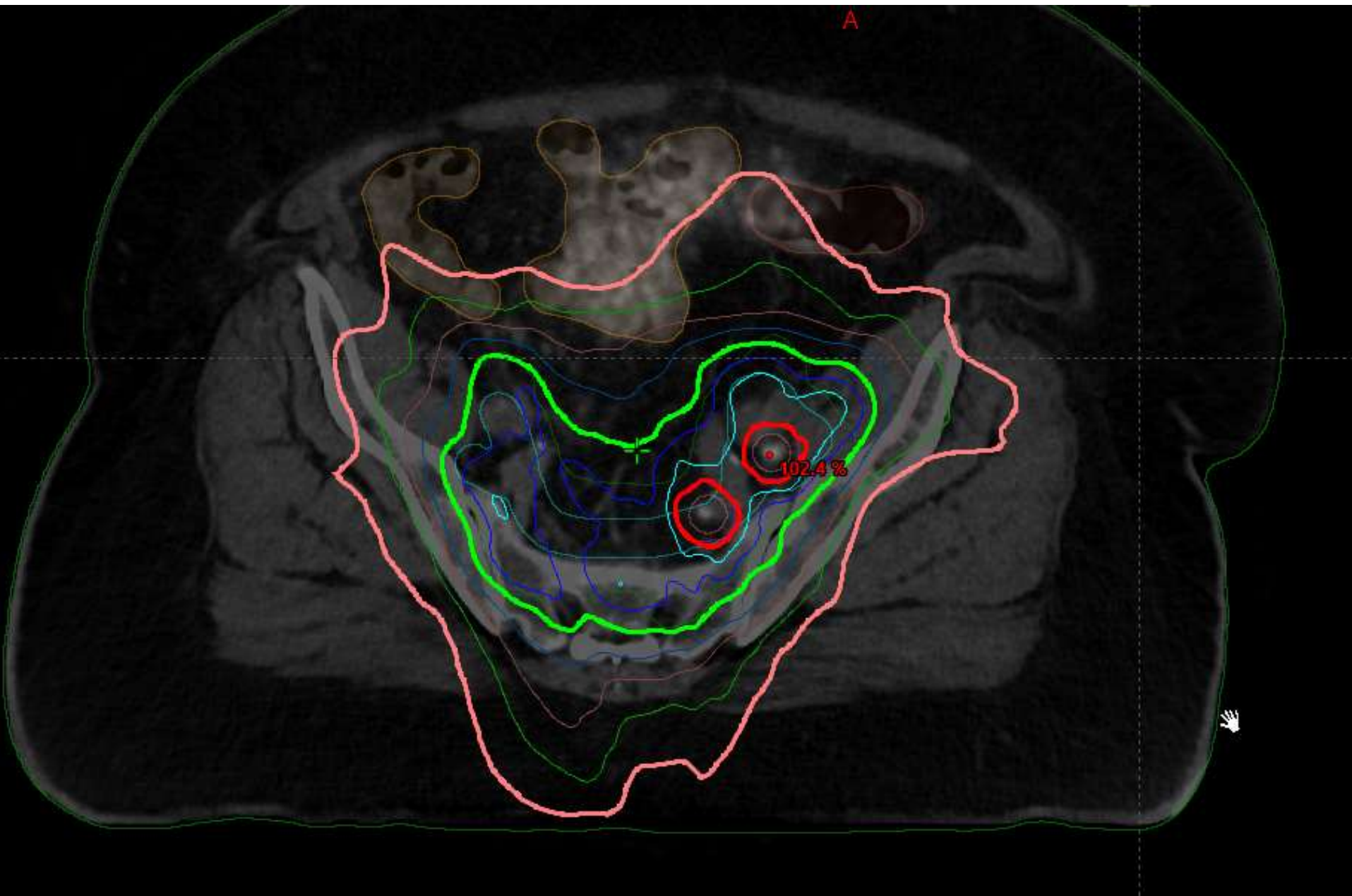
PROS BED AND BONE 2 PATIENTS (7%)

NODES AND BONE 2 PATIENTS (7%)

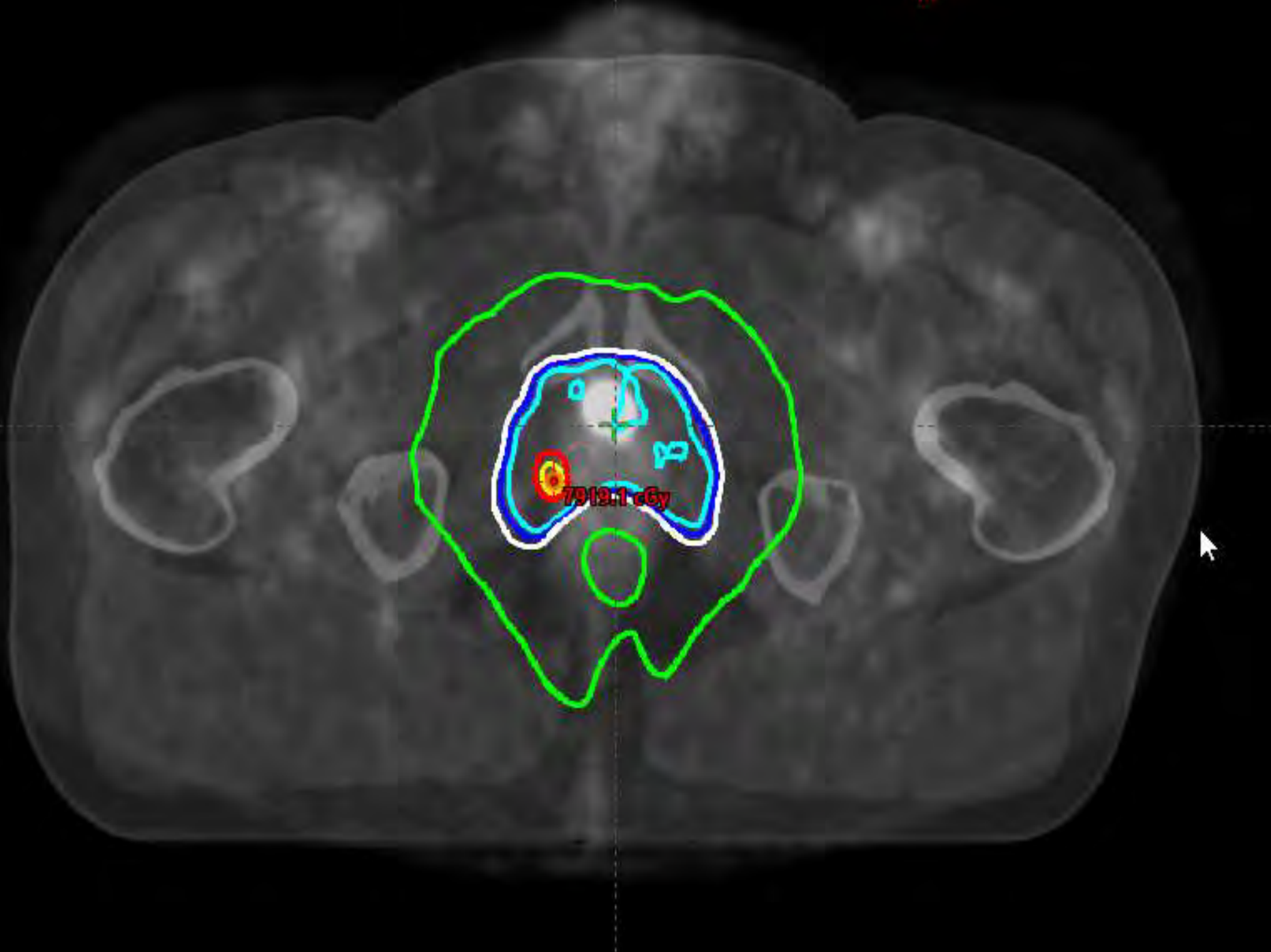




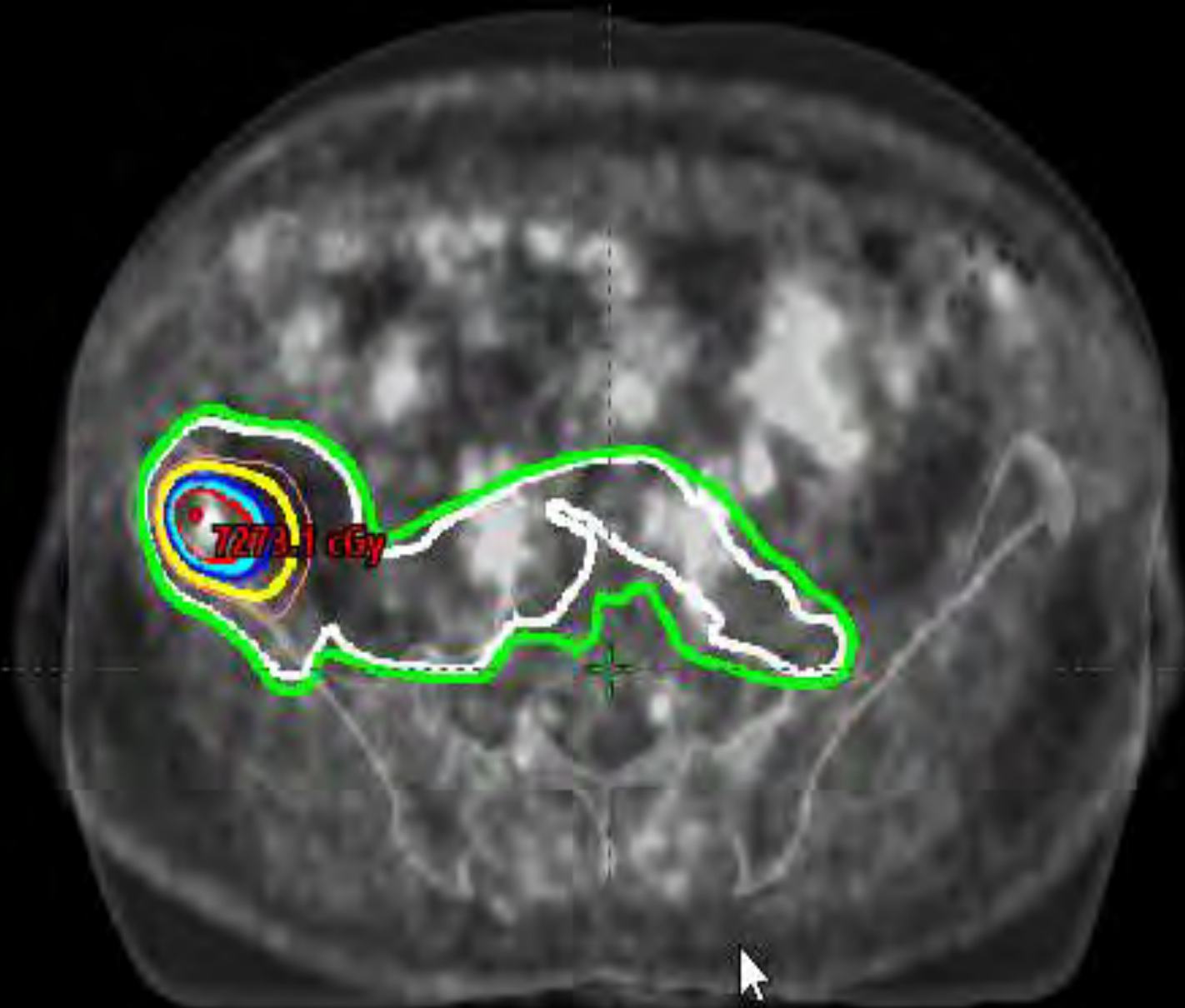




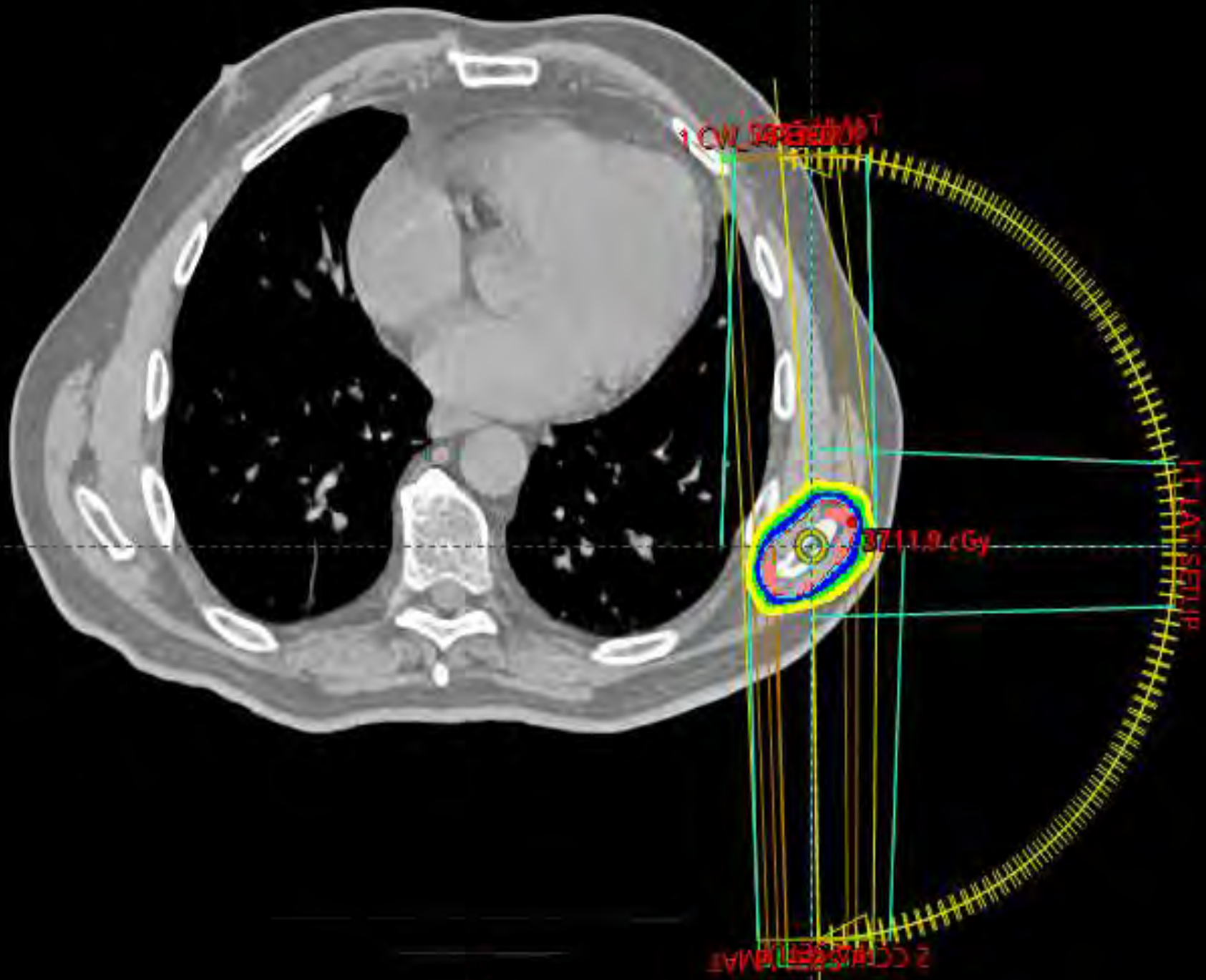
A

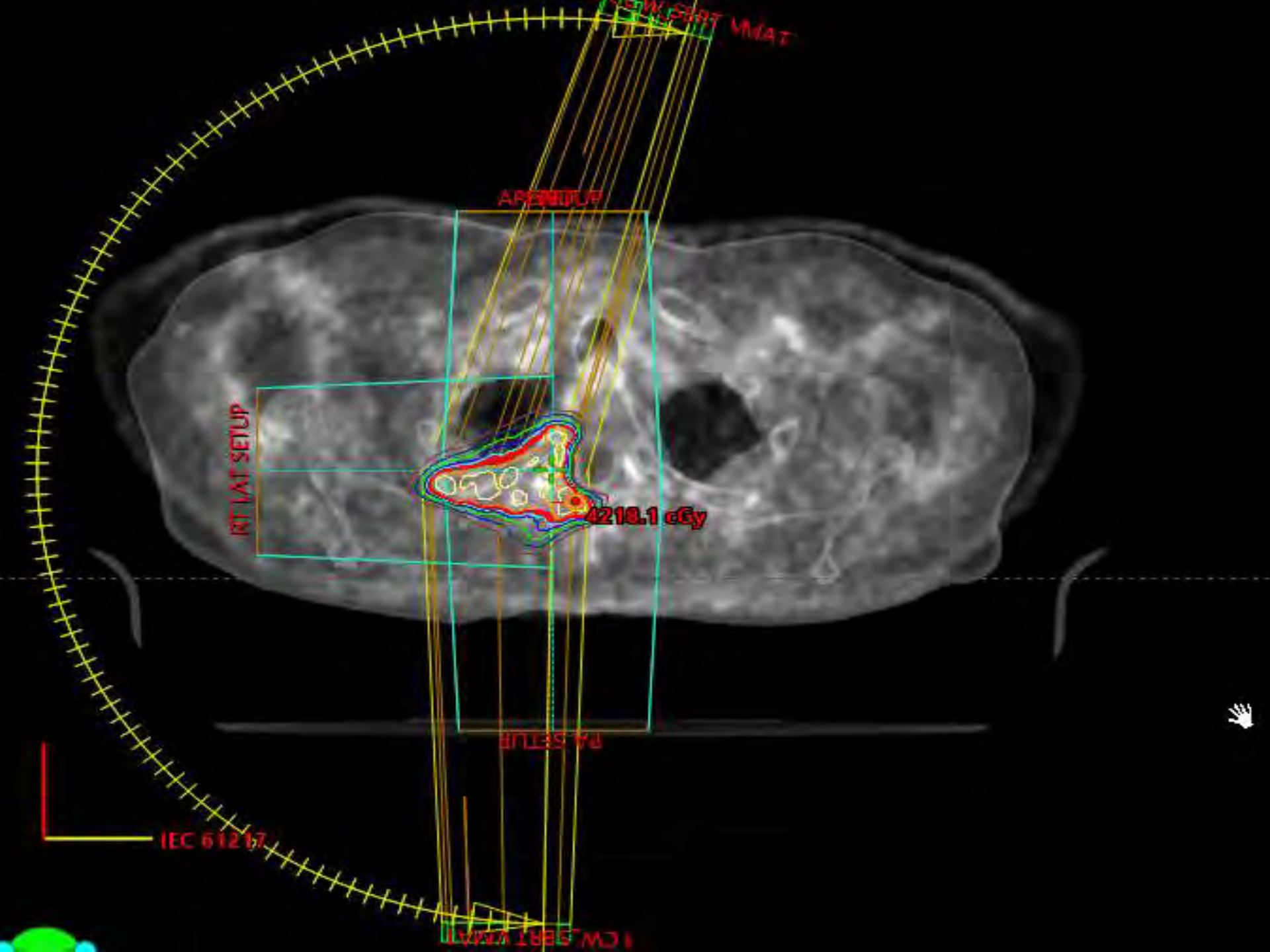


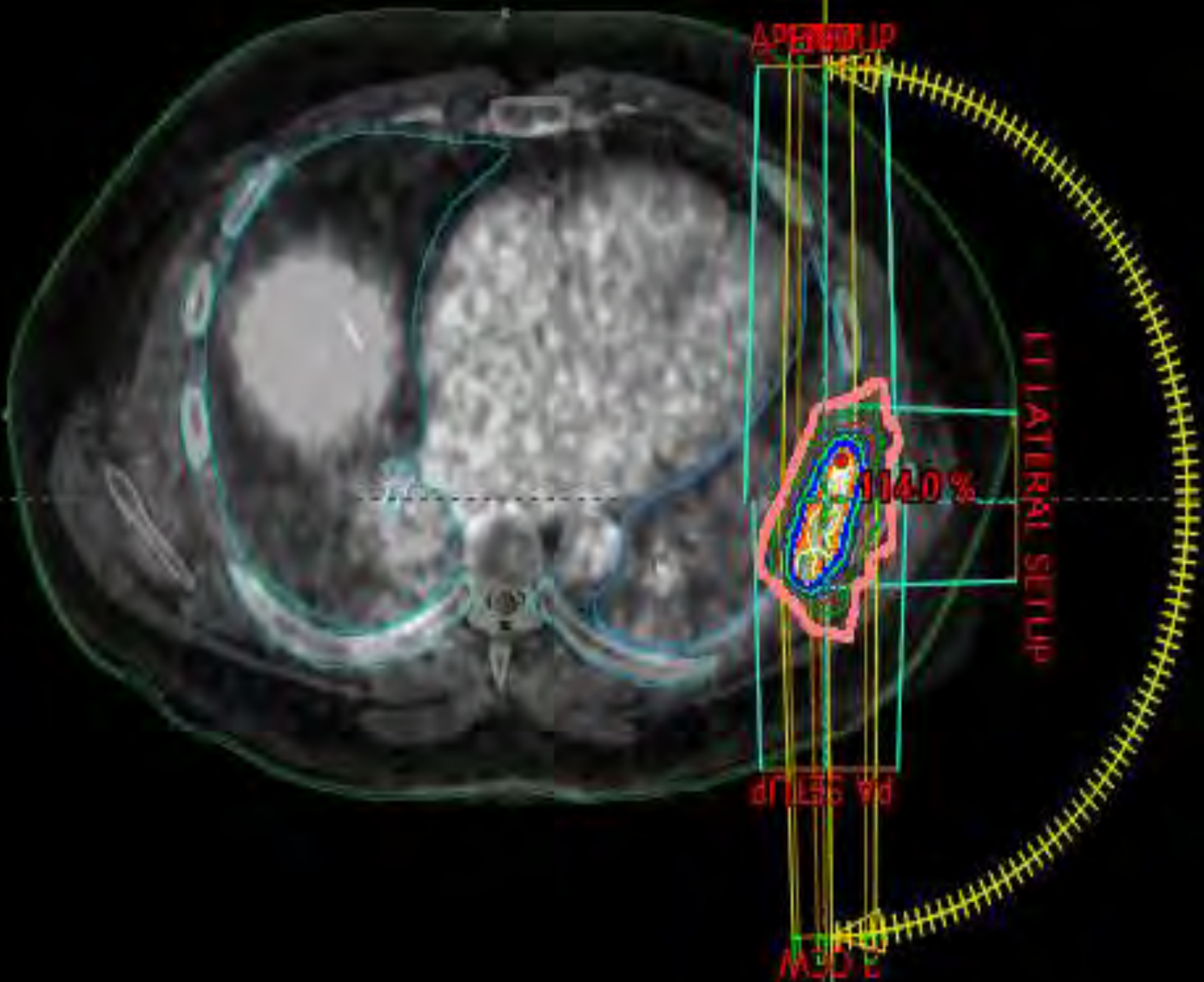
7919.1 cGy



7273.1 cGy







APERTURE IP

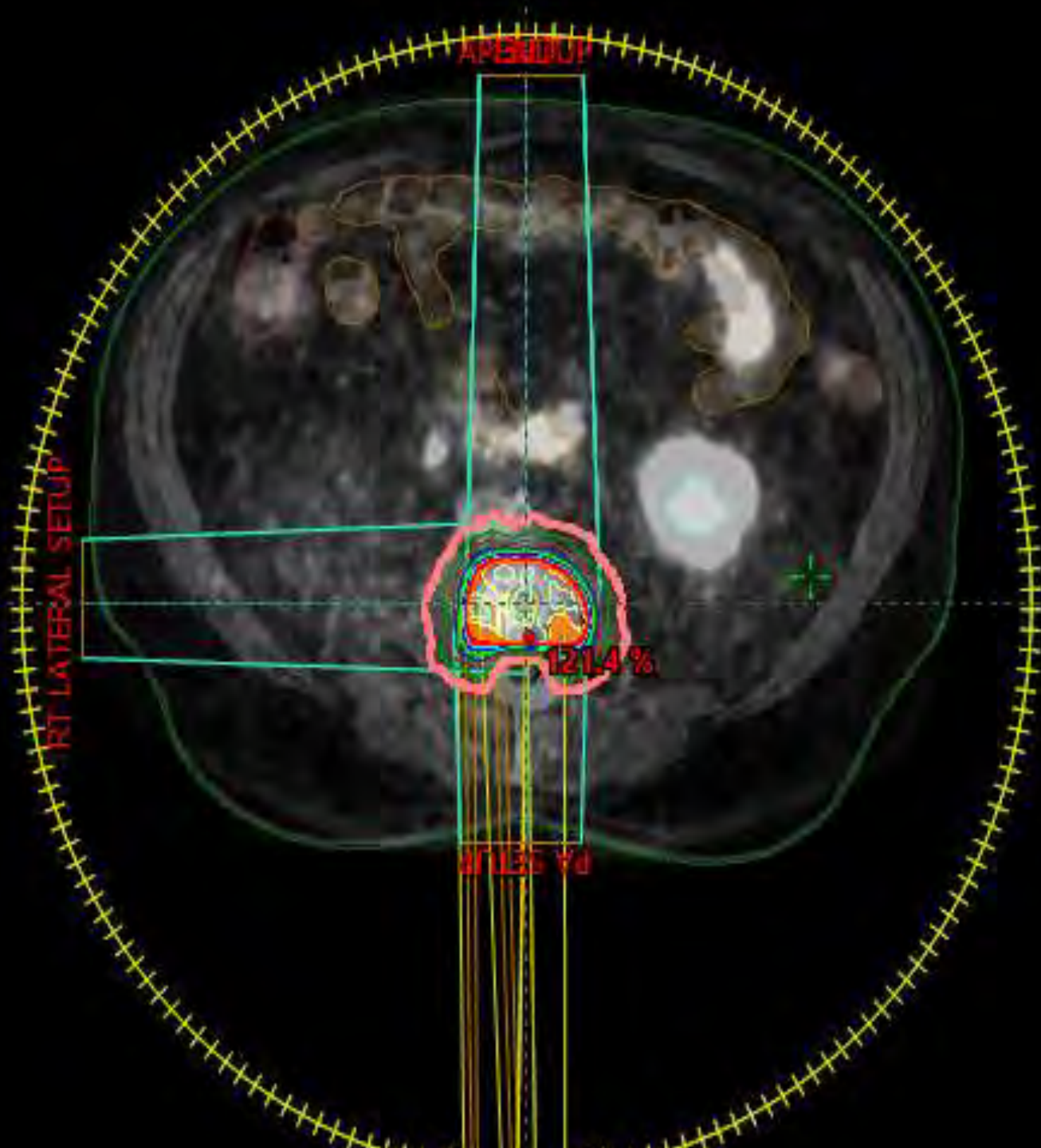
LATERAL SETUP

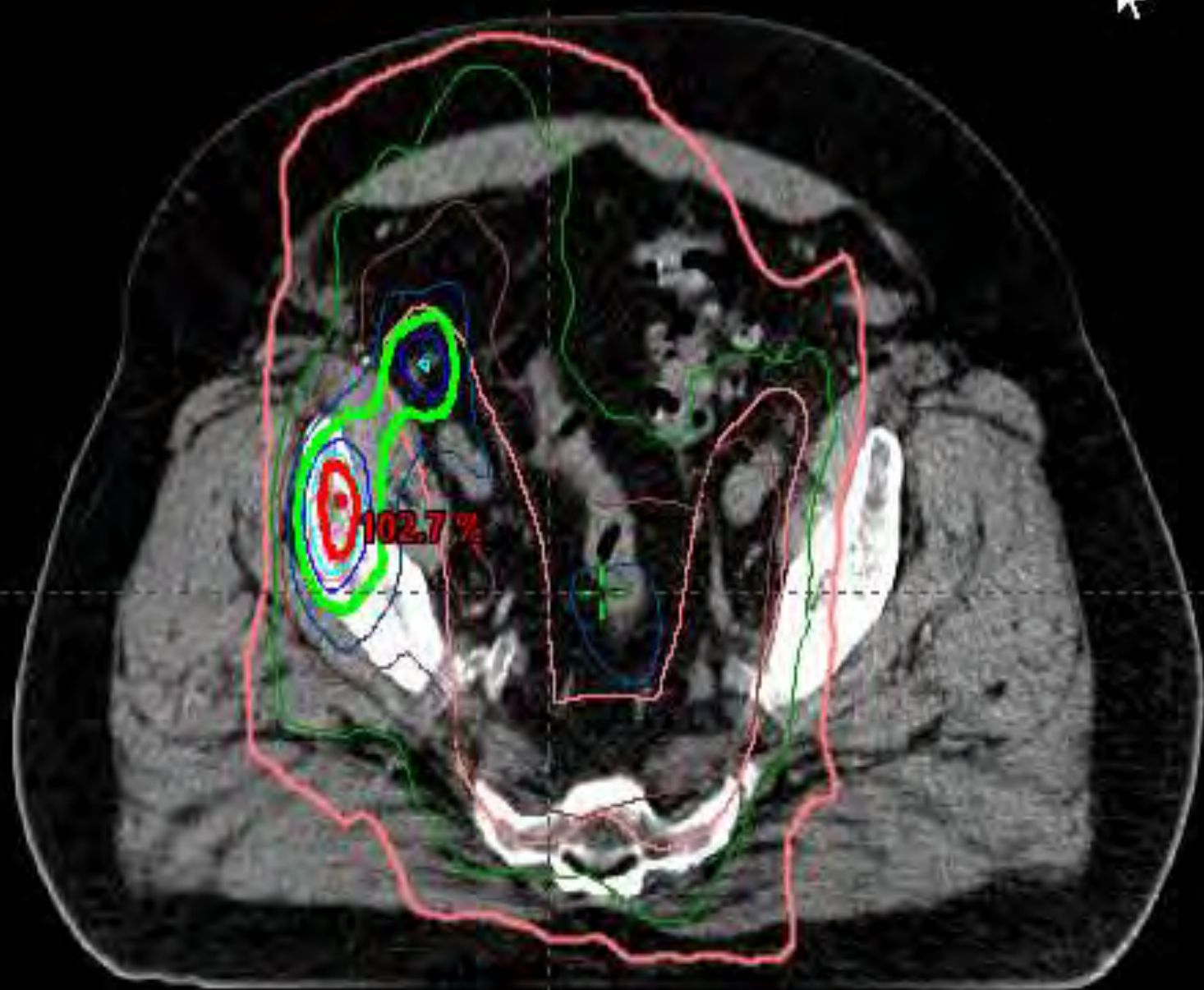
114.0%

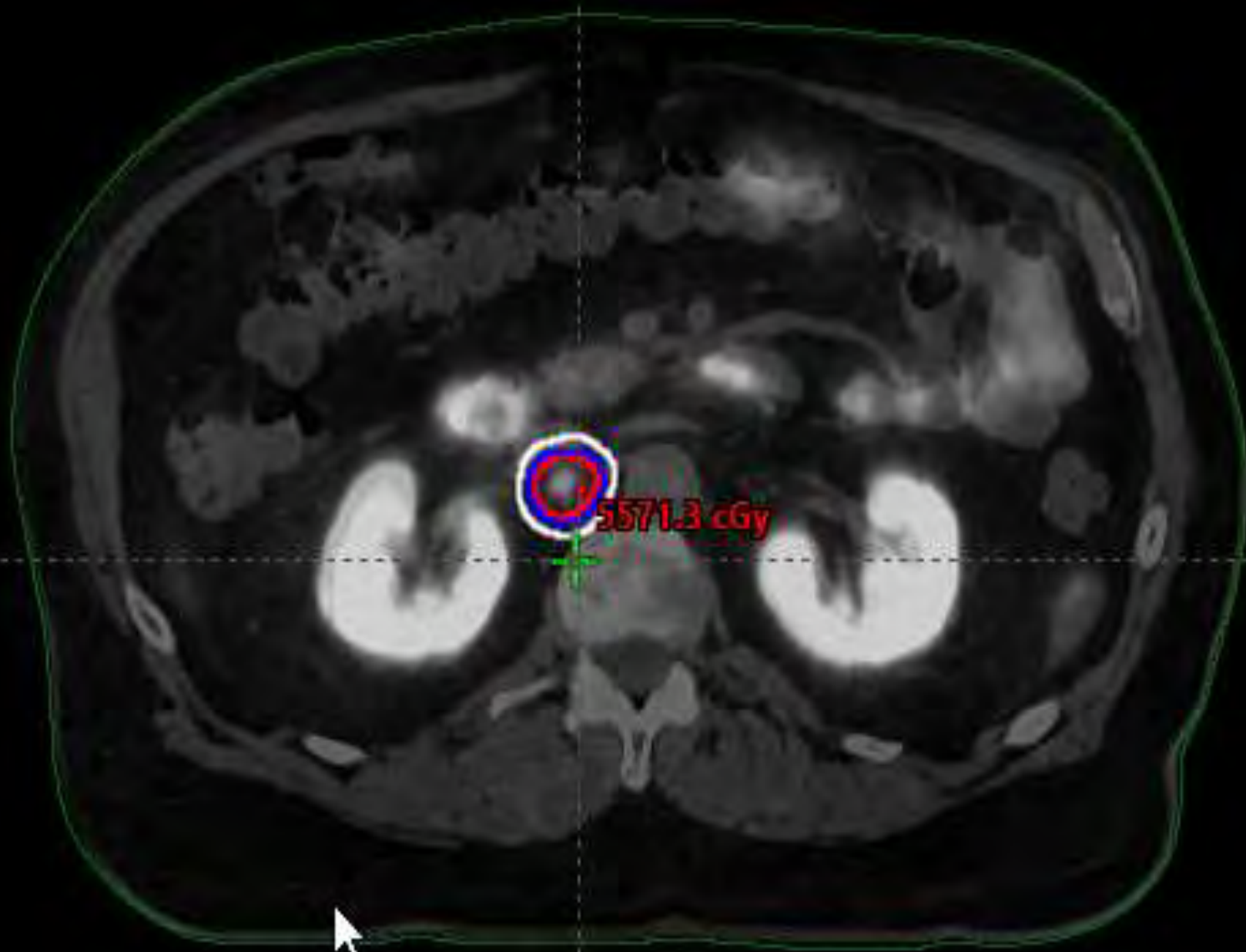
PA 95% IP

3.50 E









PLUVICTO

LUTETIUM LU 177 VIPIVOTIDE
TETRAJETAN

RADIOLIGAND THERAPY

7.4 GBq or 200 mCi GIVEN EVERY 6 WEEKS
UP TO 6 DOSES

RADIATION PRECAUTIONS AND
TEACHING



PLUVICTO

CASTRATE RESISTANT METASTATIC
PROSTATE CA

MUST HAVE FAILED CHEMOTHERAPY

PSMA POSITIVE DISEASE

AVAILABLE FOR BONE, NODAL AND
VISCERAL METASTASES.



COURTESY OF THE PLUVICTO WEBSITE

Median OS (alternate primary end point)

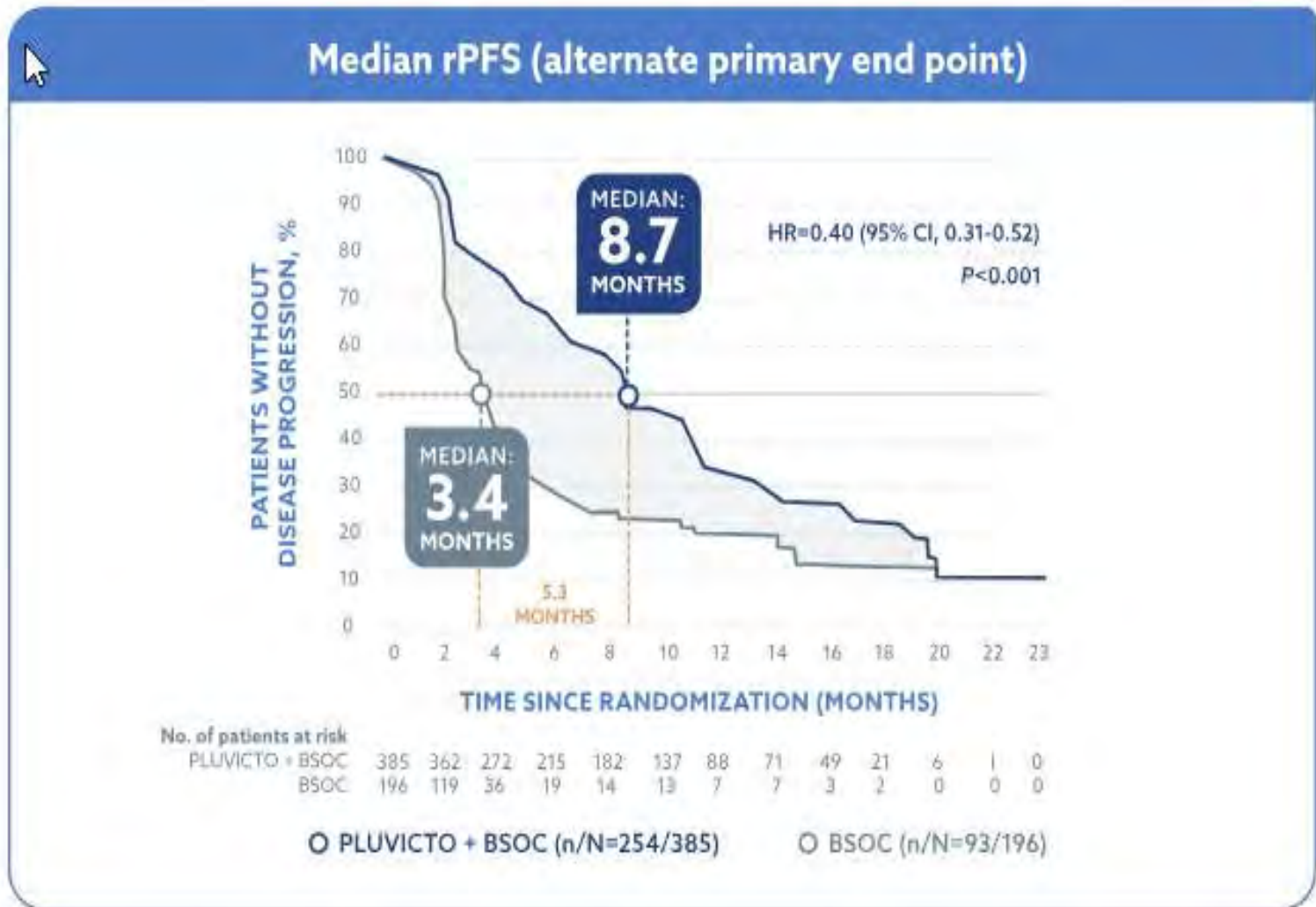


No. of patients at risk

PLUVICTO + BSOC	551	535	506	470	425	377	332	289	236	166	112	63	36	15	5	2	0
BSOC	280	238	203	173	155	133	117	98	73	51	33	16	6	2	0	0	0

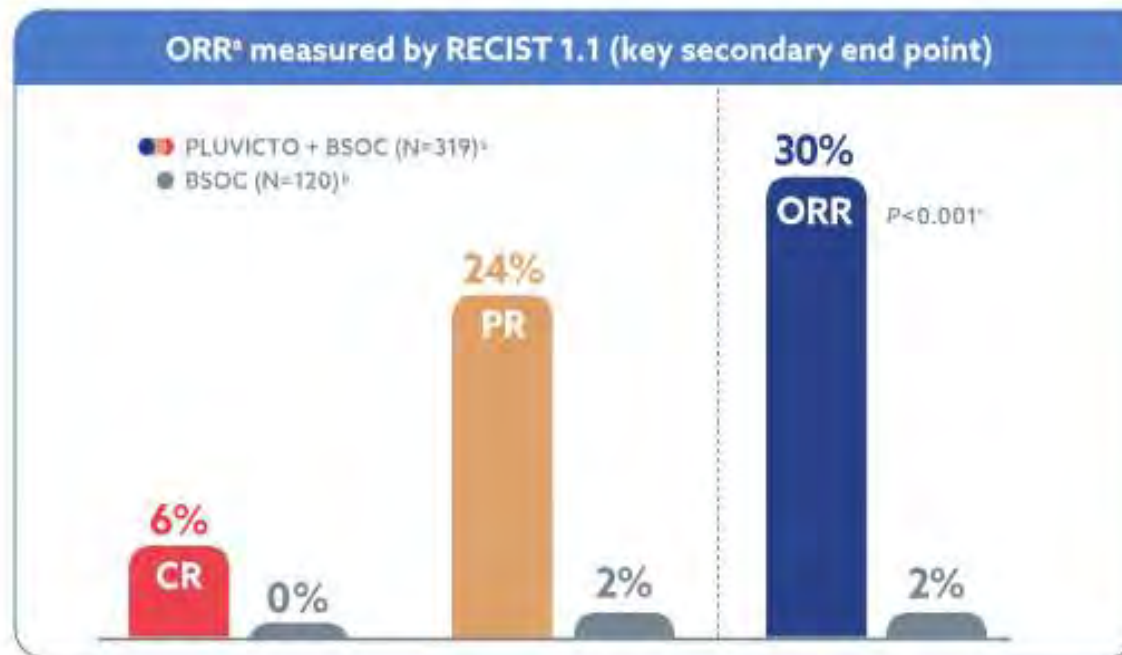
○ PLUVICTO + BSOC (n/N=343/551) ○ BSOC (n/N=187/280)

COURTESY OF THE PLUVICTO WEBSITE

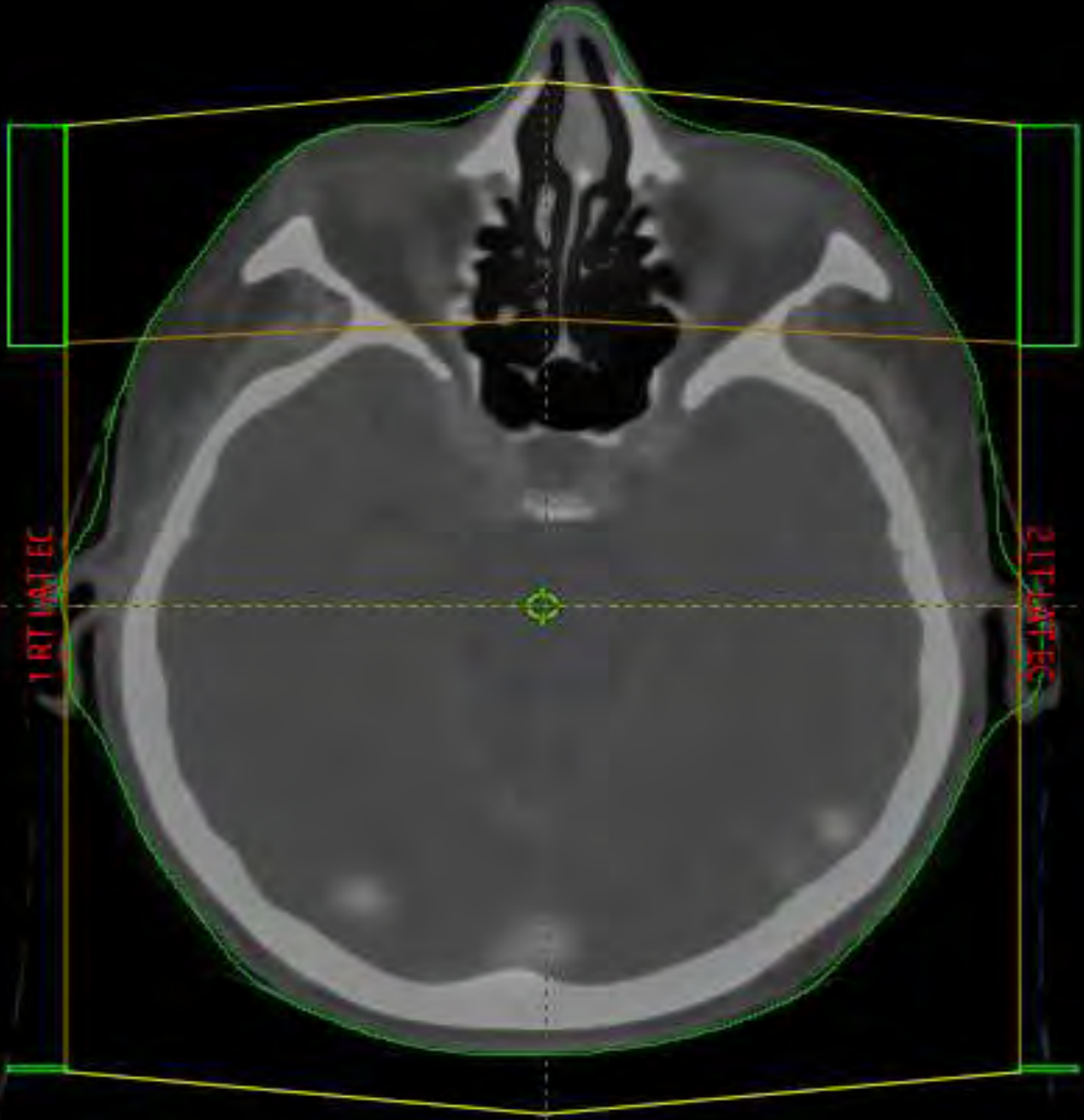


COURTESY OF THE PLUVICTO WEBSITE

PLUVICTO + BSOC significantly improved overall response rates vs BSOC alone^{1,4}



CR, complete response; ORR, overall response rate; PR, partial response; RECIST, Response Evaluation Criteria in Solid Tumors.



1 RT IAT EC

2 LT IAT EC

Case Reports

> Clin Nucl Med. 2024 Jun 1;49(6):582-583. doi: 10.1097/RLU.00000000000005126.

Epub 2024 Feb 23.

A Hangover Under 177 Lu-PSMA-617 Therapy : A Red Flag for Brain 68 Ga-PSMA-11 PET/MRI?

Nathan Poterszman¹, Laura Somme², Caroline Bund, Emilie Hutt³, François Somme¹

Affiliations

Affiliations

- 1 From the Departments of Nuclear Medicine and Molecular Imaging.
- 2 Oncology, ICANS (Institut de Cancérologie Strasbourg Europe).
- 3 Department of Oncology, Hôpitaux Civils de Colmar, Colmar, France.

PMID: 38389216 DOI: 10.1097/RLU.00000000000005126

Abstract

Leptomeningeal carcinomatosis in prostate cancer is extremely rare. Because of the low overall penetration of drugs into the brain and the prolonged survival of castration-resistant prostate cancer (CRPC) patients, a special attention should be paid to the appearance of neurological symptoms in long-term CRPC survivors. A patient suffering from a CRPC with bone metastases underwent 4 cycles of ^{177}Lu -PSMA (prostate-specific membrane antigen)-617. Starting from the third cycle, he reported an increasing feeling of a permanent hangover. A ^{68}Ga -PSMA-11 brain PET/MRI was carried out after the fourth cycle. It revealed intraparenchymatous brain metastases with intense uptake and evidences of leptomeningeal carcinomatosis.

FUTURE

INCREASE USE OF PSMA FOR STAGING
ESPECIALLY IN THE INTACT GLAND

BETTER STAGING MAY INCREASE THE USE
OF LIMITED TREATMENT SUCH AS SBRT

PLUVICTO FOR METASTATIC CASTRATE
RESISTANT PROSTATE CANCER

SCREENING AND GENETIC TESTING





QUESTIONS?



University of Nebraska Medical CenterSM

BREAKTHROUGHS FOR LIFE.[®]



UNIVERSITY OF
Nebraska
Medical Center