

**ICTP School of Medical Physics for Radiation Therapy: Dosimetry and Treatment  
Planning for Basic and Advanced Applications**

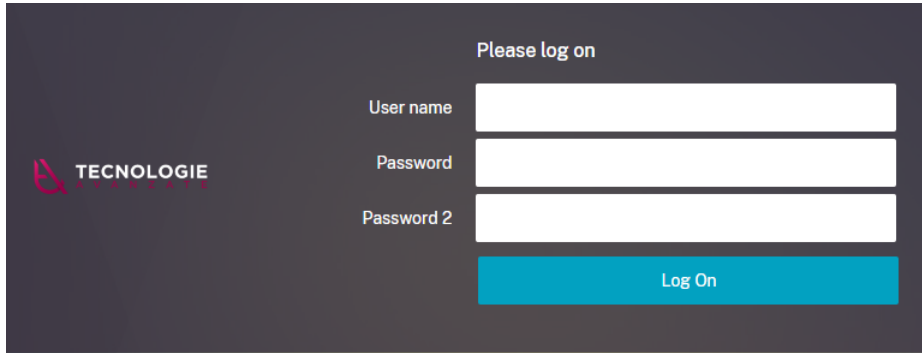
**IMRT/VMAT planning exercitation**

Trieste, 09/18/2023

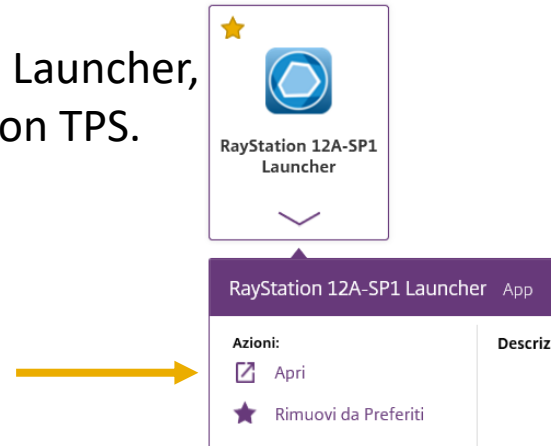
Case descriptions/objectives

# How to access Raystation TPS?

- Use the following link in Internet Explorer or Chrome:  
<https://vpx.radiazioni.it/vpn/index.html>



- Complete **User name**, **Password** and **Password 2** with the assigned group credentials. Then click «Log On».
- You will find Raystation 12°-SP1 Launcher, click on «Apri» to open Raystation TPS.

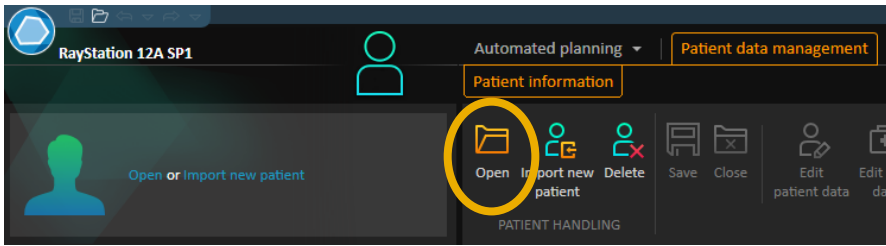


| Group: | User name: | Password:    | Password2: |
|--------|------------|--------------|------------|
| 1      | lctp1      | dDf(NxOEm=EL | ICTP2023   |
| 2      | lctp2      | dDf(NxOEm=EL | ICTP2023   |
| 3      | lctp3      | dDf(NxOEm=EL | ICTP2023   |
| 4      | lctp4      | dDf(NxOEm=EL | ICTP2023   |
| 5      | lctp5      | dDf(NxOEm=EL | ICTP2023   |
| 6      | lctp6      | dDf(NxOEm=EL | ICTP2023   |
| 7      | lctp7      | dDf(NxOEm=EL | ICTP2023   |
| 8      | lctp8      | dDf(NxOEm=EL | ICTP2023   |
| 9      | lctp9      | dDf(NxOEm=EL | ICTP2023   |
| 10     | lctp10     | dDf(NxOEm=EL | ICTP2023   |
| 11     | lctp11     | dDf(NxOEm=EL | ICTP2023   |
| 12     | lctp12     | dDf(NxOEm=EL | ICTP2023   |
| 13     | lctp13     | dDf(NxOEm=EL | ICTP2023   |
| 14     | lctp14     | dDf(NxOEm=EL | ICTP2023   |
| 15     | lctp15     | dDf(NxOEm=EL | ICTP2023   |

# Case 1: Prostate fossa and nodal region (Simultaneous Integrated Boost)

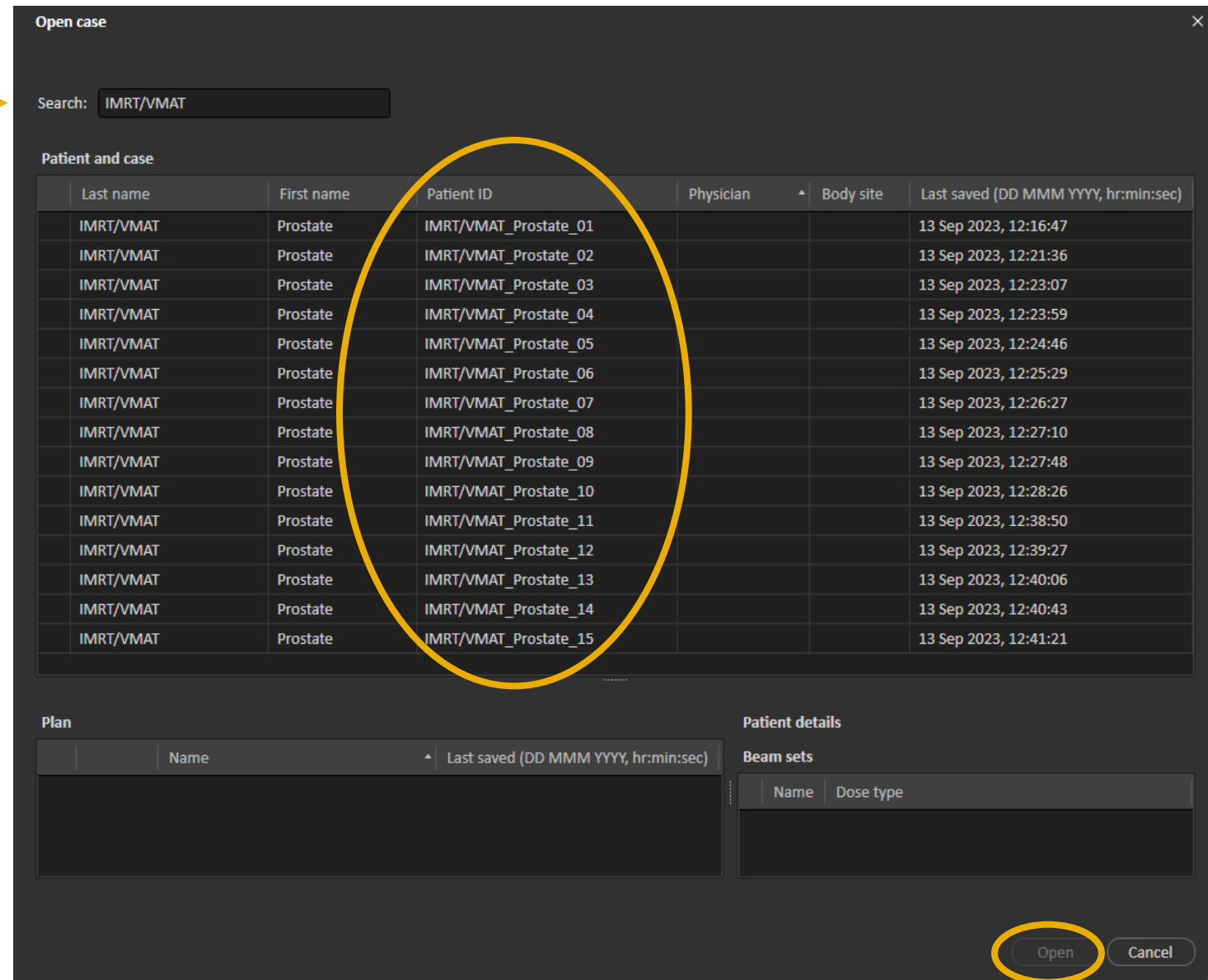
- Data set (# images): Prostate.Bed, TG244 (90)
- MRN: 002441
- Rx: PTV68 = 68 Gy and PTV 56 = 56 Gy, 34 fractions
- Objectives:

|              |         |         |
|--------------|---------|---------|
| PTV_68       | V68Gy   | 95%     |
| PTV_68       | D0.03cc | <71.5Gy |
| PROSTATE_BED | V68Gy   | 99%     |
| PTV_56       | V56Gy   | 95%     |
| RECTUM       | V65Gy   | <5%     |
| RECTUM       | V68Gy   | 0cc     |
| RECTUM       | V40Gy   | <20%    |
| BLADDER      | V65Gy   | <15%    |
| BLADDER      | V40Gy   | <40%    |



- Write in «Search»: IMRT/VMAT
- Select from the list of «Patient and case» the appropriate **Patient ID** according to your Group #:

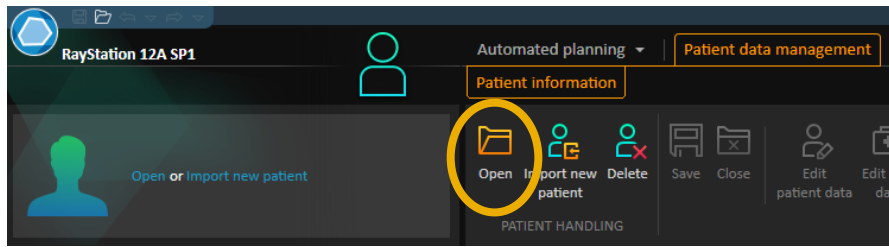
| Group: | Patient ID in Raystation |
|--------|--------------------------|
| Ictp1  | IMRT/VMAT_Prostate_01    |
| Ictp2  | IMRT/VMAT_Prostate_02    |
| Ictp3  | IMRT/VMAT_Prostate_03    |
| Ictp4  | IMRT/VMAT_Prostate_04    |
| Ictp5  | IMRT/VMAT_Prostate_05    |
| Ictp6  | IMRT/VMAT_Prostate_06    |
| Ictp7  | IMRT/VMAT_Prostate_07    |
| Ictp8  | IMRT/VMAT_Prostate_08    |
| Ictp9  | IMRT/VMAT_Prostate_09    |
| Ictp10 | IMRT/VMAT_Prostate_10    |
| Ictp11 | IMRT/VMAT_Prostate_11    |
| Ictp12 | IMRT/VMAT_Prostate_12    |
| Ictp13 | IMRT/VMAT_Prostate_13    |
| Ictp14 | IMRT/VMAT_Prostate_14    |
| Ictp15 | IMRT/VMAT_Prostate_15    |



## Case 2: Abdomen

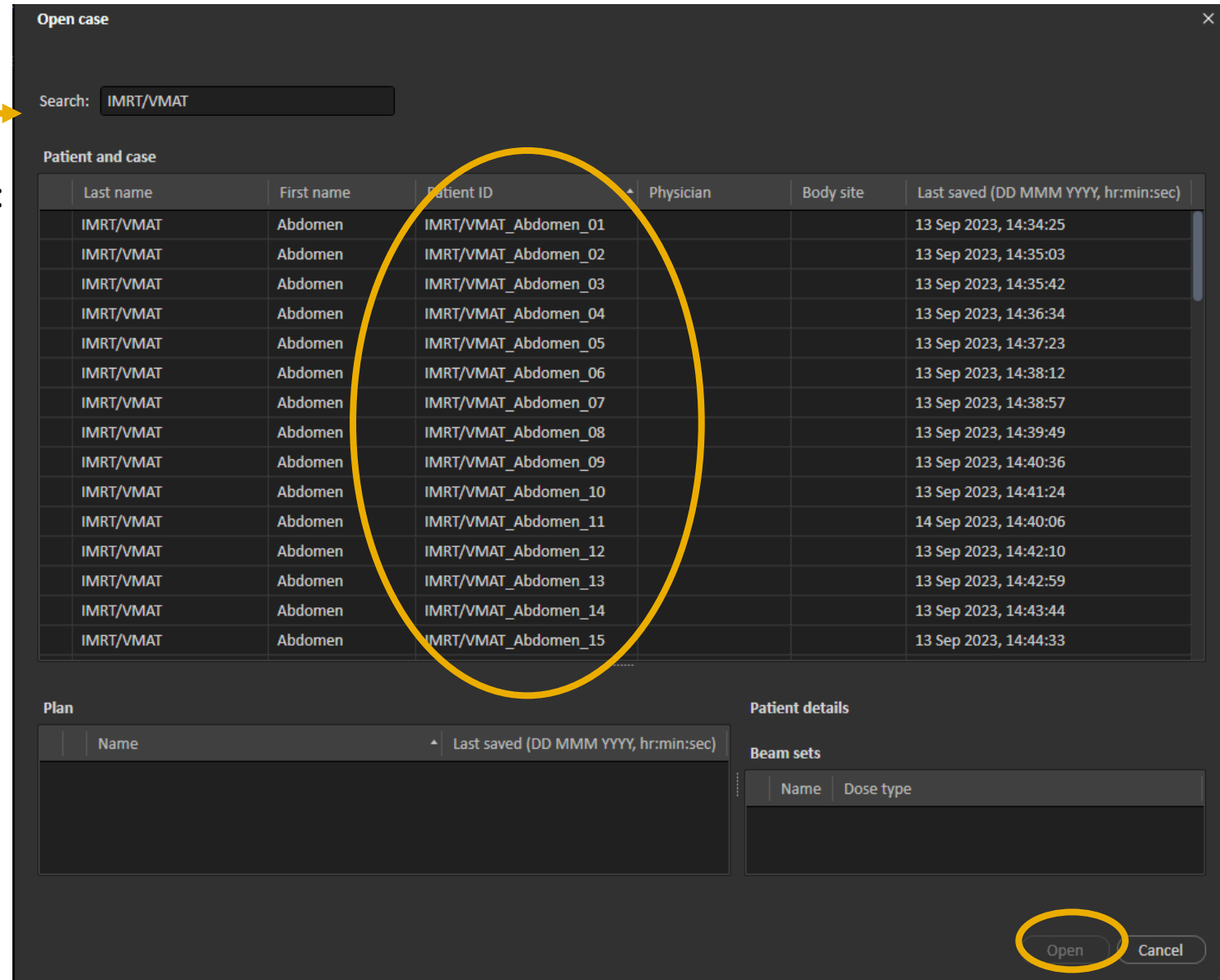
- Data set (# images): ABDOMEN, TG244 (168)
- MRN: 002442
- Rx: PTV 52= 52 Gy and PTV46\_8=46.8 Gy, 26 fractions
- Objectives:

|                 |         |         |
|-----------------|---------|---------|
| PTV_5200        | V52Gy   | 95%     |
| PTV_5200        | V49.4Gy | 99%     |
| PTV_5200        | D0.03cc | <53Gy   |
| CTV_5200        | V52Gy   | 99%     |
| PTV4680-PTV5200 | V46.8Gy | 95%     |
| PTV4680-PTV5200 | V44.6Gy | 99%     |
| CORD            | D0.03cc | <45Gy   |
| RT KIDNEY       | V18Gy   | <50%    |
| LT KIDNEY       | V18Gy   | <30%    |
| BOWEL           | V45Gy   | <175 cc |
| LIVER           | MEAN    | <5Gy    |
| STOMACH         | D25%    | <10Gy   |



- Write in «Search»: IMRT/VMAT
- Select from the list of «Patient and case» the appropriate **Patient ID** according to your Group #:

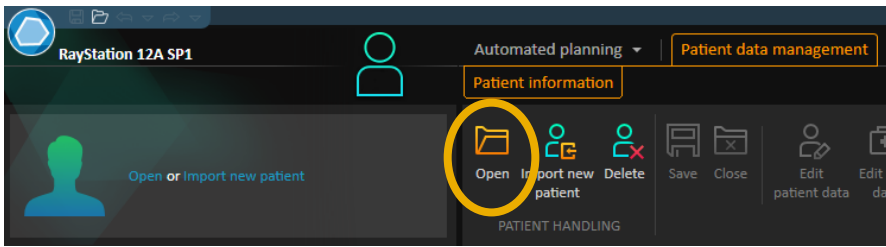
| Group: | Patient ID in Raystation |
|--------|--------------------------|
| lctp1  | IMRT/VMAT_Abdomen_01     |
| lctp2  | IMRT/VMAT_Abdomen_02     |
| lctp3  | IMRT/VMAT_Abdomen_03     |
| lctp4  | IMRT/VMAT_Abdomen_04     |
| lctp5  | IMRT/VMAT_Abdomen_05     |
| lctp6  | IMRT/VMAT_Abdomen_06     |
| lctp7  | IMRT/VMAT_Abdomen_07     |
| lctp8  | IMRT/VMAT_Abdomen_08     |
| lctp9  | IMRT/VMAT_Abdomen_09     |
| lctp10 | IMRT/VMAT_Abdomen_10     |
| lctp11 | IMRT/VMAT_Abdomen_11     |
| lctp12 | IMRT/VMAT_Abdomen_12     |
| lctp13 | IMRT/VMAT_Abdomen_13     |
| lctp14 | IMRT/VMAT_Abdomen_14     |
| lctp15 | IMRT/VMAT_Abdomen_15     |



## Case 3: Lung, Right upper lobe (single PTV)

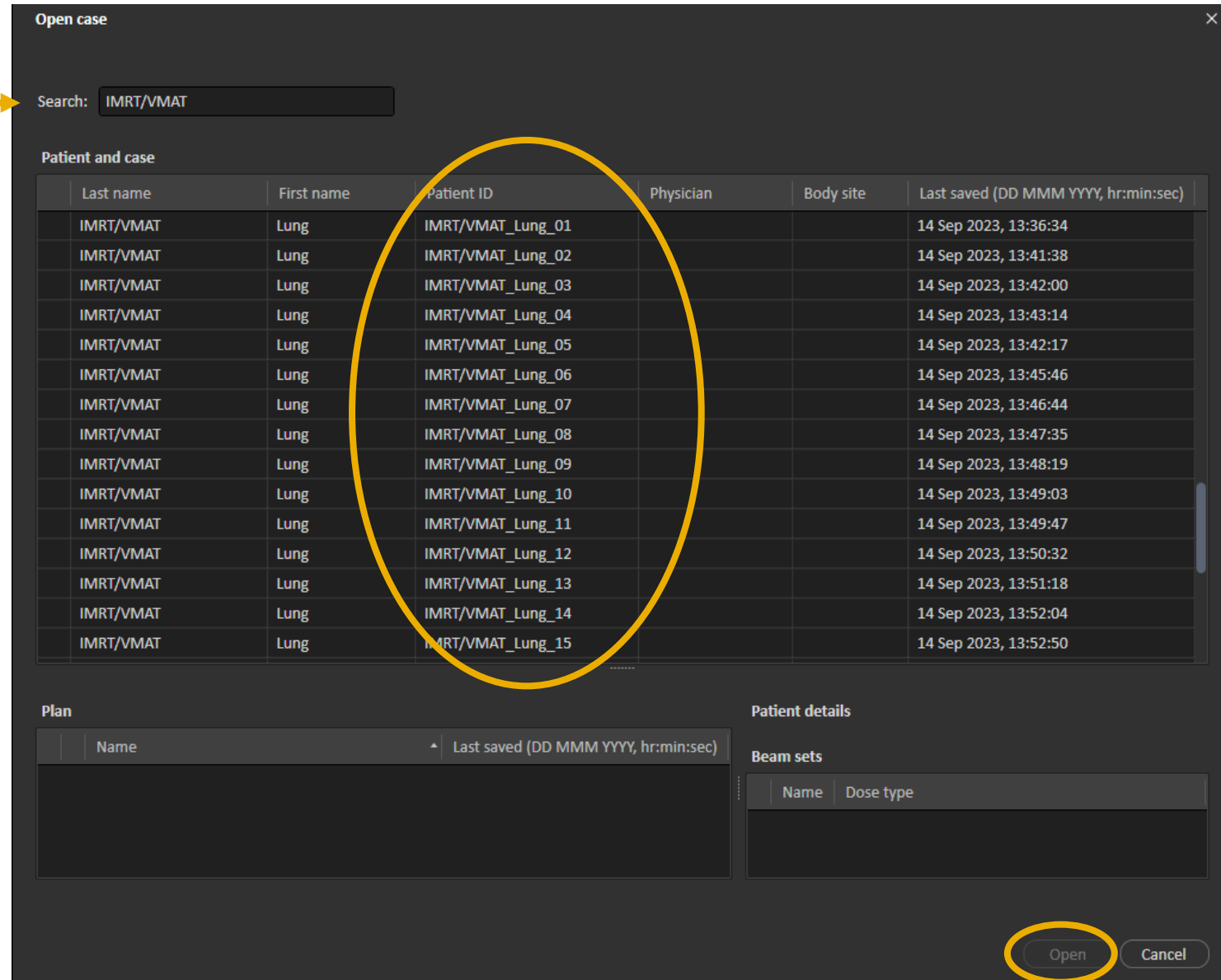
- Data set (# images): LUNG, TG244 (200)
- MRN: 002443
- Rx: PTV63 = 63 Gy, 35 fractions
- Objectives:

|                |          |       |
|----------------|----------|-------|
| PTV63          | V63Gy    | 95%   |
| PTV63          | V59.85Gy | 99%   |
| PTV63          | D0.03cc  | <67Gy |
| GTV63          | V63Gy    | 99%   |
| SPINAL_CORD    | D0.03cc  | <45Gy |
| LEFT_LUNG      | V10Gy    | <30%  |
| TOTAL_LUNG-GTV | V20Gy    | <24%  |
| TOTAL_LUNG-GTV | MEAN     | <16Gy |
| TOTAL_LUNG-GTV | V10Gy    | <40%  |
| HEART          | V50Gy    | <2%   |
| ESOPHAGUS      | Mean     | <15Gy |



- Write in «Search»: IMRT/VMAT
- Select from the list of «Patient and case» the appropriate **Patient ID** according to your Group #:

| Group: | Patient ID in Raystation |
|--------|--------------------------|
| lctp1  | IMRT/VMAT_Lung_01        |
| lctp2  | IMRT/VMAT_Lung_02        |
| lctp3  | IMRT/VMAT_Lung_03        |
| lctp4  | IMRT/VMAT_Lung_04        |
| lctp5  | IMRT/VMAT_Lung_05        |
| lctp6  | IMRT/VMAT_Lung_06        |
| lctp7  | IMRT/VMAT_Lung_07        |
| lctp8  | IMRT/VMAT_Lung_08        |
| lctp9  | IMRT/VMAT_Lung_09        |
| lctp10 | IMRT/VMAT_Lung_10        |
| lctp11 | IMRT/VMAT_Lung_11        |
| lctp12 | IMRT/VMAT_Lung_12        |
| lctp13 | IMRT/VMAT_Lung_13        |
| lctp14 | IMRT/VMAT_Lung_14        |
| lctp15 | IMRT/VMAT_Lung_15        |

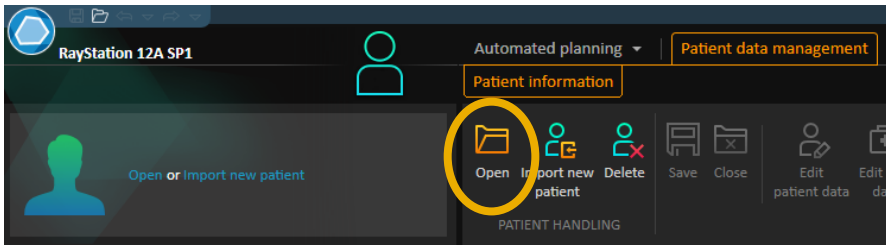




# Case 4: Anal (Simultaneous Integrated Boost)

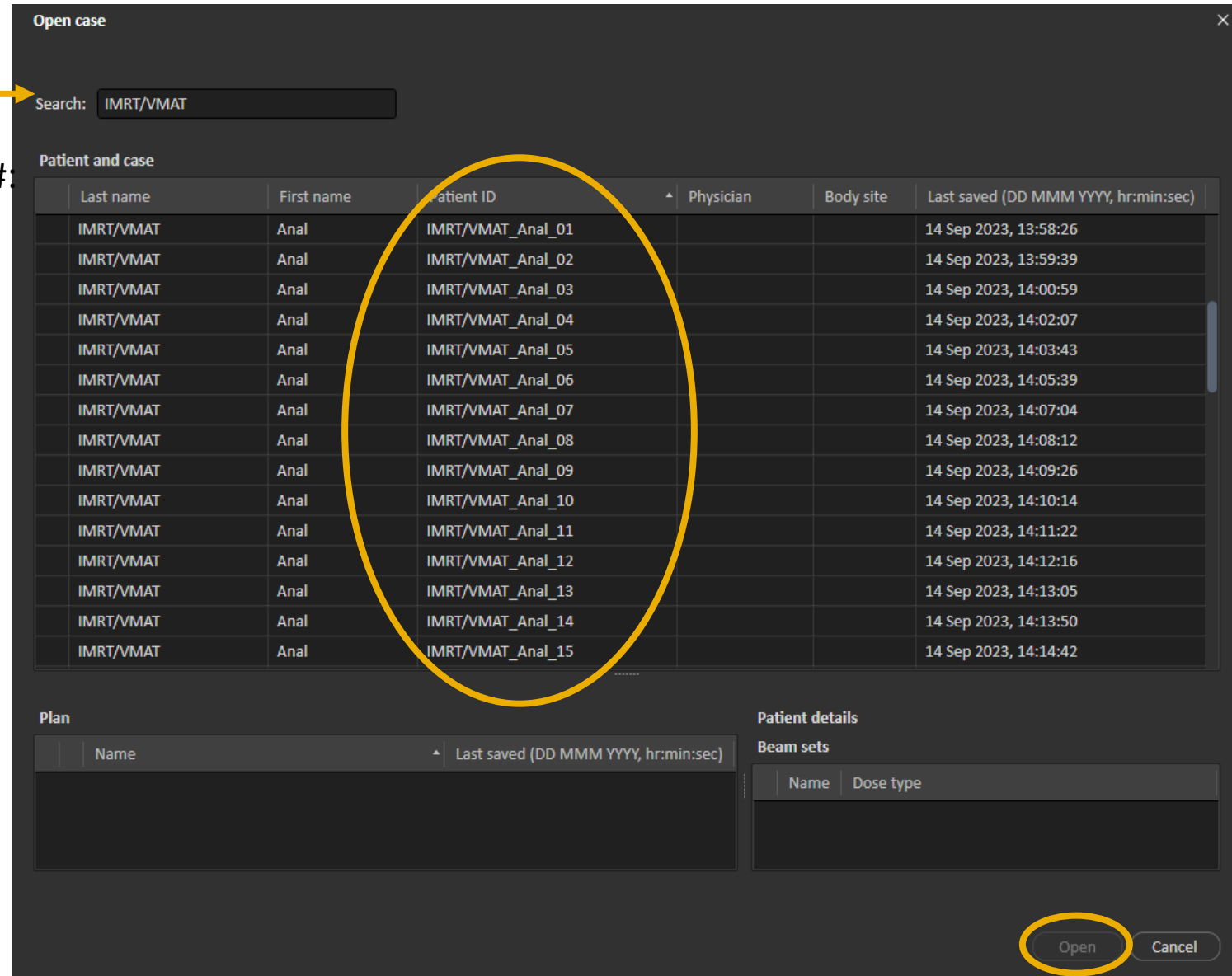
- Data set (# images): ANAL, TG244 (117)
- MRN: 002444
- Rx: PTV 50\_4=50.4 Gy and PTV45=45 Gy, 28 fractions
- Objectives:

|               |          |         |
|---------------|----------|---------|
| PTV_5040      | V50.4Gy  | 95%     |
| PTV_5040      | V47.88Gy | 99%     |
| PTV_5040      | D0.03cc  | <55.4Gy |
| PTV_4500      | V45Gy    | 95%     |
| PTV_4500      | V42.75Gy | 99%     |
| BOWEL         | V45 Gy   | <3cc    |
| BOWEL         | Max      | <50Gy   |
| BLADDER       | V35Gy    | <5%     |
| BLADDER       | V40Gy    | <2%     |
| GENITALIA_EXT | V40Gy    | 0%      |
| RECTUM        | V30Gy    | <35%    |
| FEMUR_R       | V44Gy    | 0%      |
| FEMUR_L       | V44Gy    | 0%      |



- Write in «Search»: IMRT/VMAT
- Select from the list of «Patient and case» the appropriate **Patient ID** according to your Group #

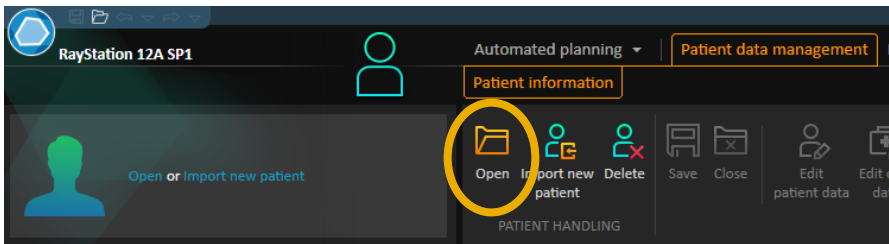
| Group: | Patient ID in Raystation |
|--------|--------------------------|
| lctp1  | IMRT/VMAT_Anal_01        |
| lctp2  | IMRT/VMAT_Anal_02        |
| lctp3  | IMRT/VMAT_Anal_03        |
| lctp4  | IMRT/VMAT_Anal_04        |
| lctp5  | IMRT/VMAT_Anal_05        |
| lctp6  | IMRT/VMAT_Anal_06        |
| lctp7  | IMRT/VMAT_Anal_07        |
| lctp8  | IMRT/VMAT_Anal_08        |
| lctp9  | IMRT/VMAT_Anal_09        |
| lctp10 | IMRT/VMAT_Anal_10        |
| lctp11 | IMRT/VMAT_Anal_11        |
| lctp12 | IMRT/VMAT_Anal_12        |
| lctp13 | IMRT/VMAT_Anal_13        |
| lctp14 | IMRT/VMAT_Anal_14        |
| lctp15 | IMRT/VMAT_Anal_15        |



# Case 5: Head & Neck (Simultaneous Integrated Boost)

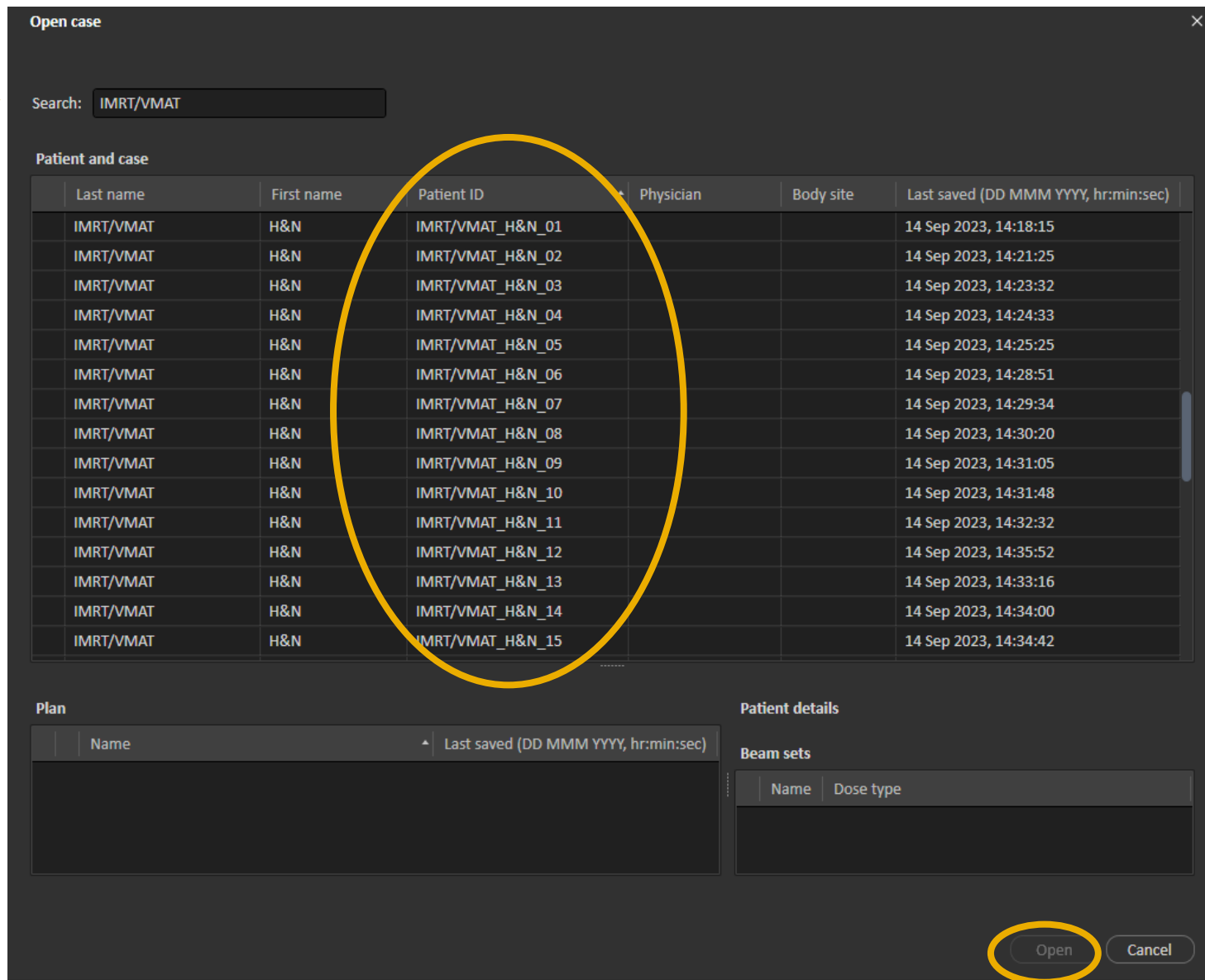
- Data set (# images): HEADandNECK, TG244 (124)
- MRN: 002445
- Rx: PTV70=70Gy, PTV 63=63 Gy, PTV56= 56 Gy, 35 fractions
- Objectives:

|              |         |       |
|--------------|---------|-------|
| PTV70        | V70Gy   | 95%   |
| PTV70        | V73.5Gy | 0%    |
| PTV70        | D0.03cc | 77Gy  |
| CTV70        | V70Gy   | 99%   |
| PTV63        | V63Gy   | 95%   |
| PTV56        | V56Gy   | 95%   |
| SPINAL_CORD  | D0.03cc | <48Gy |
| BRAINSTEM    | D0.03cc | <52Gy |
| RT INNER EAR | D0.03cc | <35Gy |
| LT INNER EAR | D0.03cc | <37Gy |
| LIPS         | V30Gy   | <20%  |
| RT PAROTID   | Mean    | <24Gy |
| MANDIBLE     | V70Gy   | <10%  |
| LARYNX       | Mean    | <45Gy |



- Write in «Search»: IMRT/VMAT
- Select from the list of «Patient and case» the appropriate **Patient ID** according to your Group #:

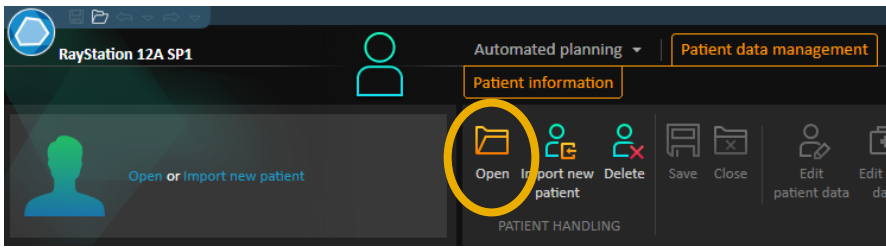
| Group: | Patient ID in Raystation |
|--------|--------------------------|
| lctp1  | IMRT/VMAT_H&N_01         |
| lctp2  | IMRT/VMAT_H&N_02         |
| lctp3  | IMRT/VMAT_H&N_03         |
| lctp4  | IMRT/VMAT_H&N_04         |
| lctp5  | IMRT/VMAT_H&N_05         |
| lctp6  | IMRT/VMAT_H&N_06         |
| lctp7  | IMRT/VMAT_H&N_07         |
| lctp8  | IMRT/VMAT_H&N_08         |
| lctp9  | IMRT/VMAT_H&N_09         |
| lctp10 | IMRT/VMAT_H&N_10         |
| lctp11 | IMRT/VMAT_H&N_11         |
| lctp12 | IMRT/VMAT_H&N_12         |
| lctp13 | IMRT/VMAT_H&N_13         |
| lctp14 | IMRT/VMAT_H&N_14         |
| lctp15 | IMRT/VMAT_H&N_15         |



## Case 6 Left Breast

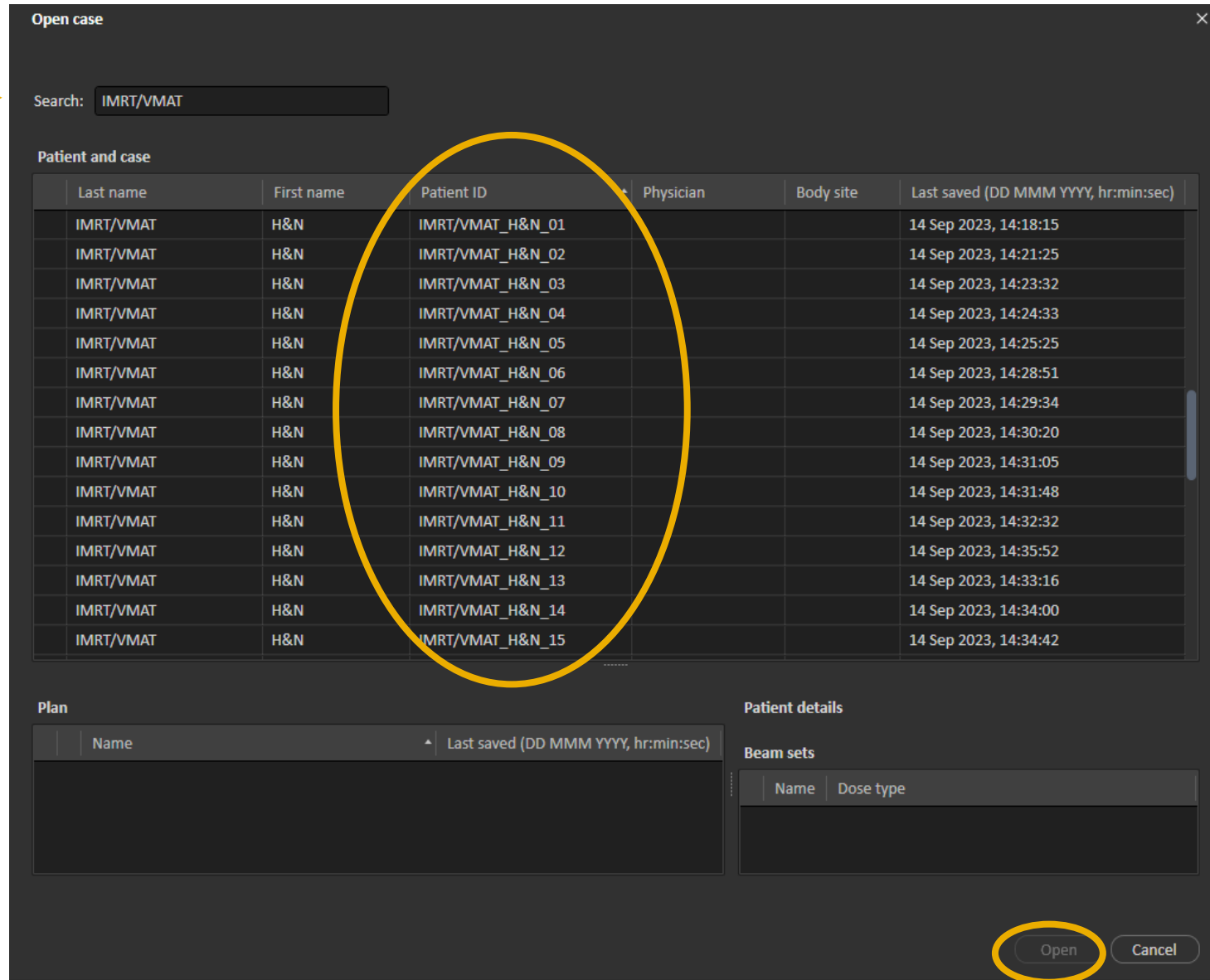
- 2 Data sets (# images): Breast\_FB (), Breast\_DIBH ()
- MRN: 002445
- Rx: PTV40=40 Gy, 15 fractions
- Objectives:

|          |                       |                 |
|----------|-----------------------|-----------------|
| PTV 40   | V38                   | 95%             |
| PTV 40   | $V_{105\%}-V_{107\%}$ | $\leq 2\%$      |
|          | $V_{107\%}-V_{110\%}$ | $\leq 2$ cc     |
| Lung_L   | V18                   | <15%            |
|          | V18                   | <10% (Ideal)    |
| Heart    | V13                   | <10%            |
|          | V13                   | <2% (Ideal)     |
|          | Dmean                 | < 3 Gy (Ideal)  |
| LAD      | Dmax                  | <17 Gy          |
| Breast_R | Dmean                 | <1.5 Gy         |
|          | Dmean                 | <0.5 Gy (Ideal) |



- Write in «Search»: IMRT/VMAT
- Select from the list of «Patient and case» the appropriate **Patient ID** according to your Group #:

| Group: | Patient ID in Raystation |
|--------|--------------------------|
| lctp1  | IMRT/VMAT_Breast_01      |
| lctp2  | IMRT/VMAT_Breast_02      |
| lctp3  | IMRT/VMAT_Breast_03      |
| lctp4  | IMRT/VMAT_Breast_04      |
| lctp5  | IMRT/VMAT_Breast_05      |
| lctp6  | IMRT/VMAT_Breast_06      |
| lctp7  | IMRT/VMAT_Breast_07      |
| lctp8  | IMRT/VMAT_Breast_08      |
| lctp9  | IMRT/VMAT_Breast_09      |
| lctp10 | IMRT/VMAT_Breast_10      |
| lctp11 | IMRT/VMAT_Breast_11      |
| lctp12 | IMRT/VMAT_Breast_12      |
| lctp13 | IMRT/VMAT_Breast_13      |
| lctp14 | IMRT/VMAT_Breast_14      |
| lctp15 | IMRT/VMAT_Breast_15      |



| <b>Group:</b> | <b>Prostate</b>       | <b>Abdomen</b>       | <b>Lung</b>       | <b>Anal</b>       | <b>Head &amp; Neck</b> | <b>Breast</b>       |
|---------------|-----------------------|----------------------|-------------------|-------------------|------------------------|---------------------|
| lctp1         | IMRT/VMAT_Prostate_01 | IMRT/VMAT_Abdomen_01 | IMRT/VMAT_Lung_01 | IMRT/VMAT_Anal_01 | IMRT/VMAT_H&N_01       | IMRT/VMAT_Breast_01 |
| lctp2         | IMRT/VMAT_Prostate_02 | IMRT/VMAT_Abdomen_02 | IMRT/VMAT_Lung_02 | IMRT/VMAT_Anal_02 | IMRT/VMAT_H&N_02       | IMRT/VMAT_Breast_02 |
| lctp3         | IMRT/VMAT_Prostate_03 | IMRT/VMAT_Abdomen_03 | IMRT/VMAT_Lung_03 | IMRT/VMAT_Anal_03 | IMRT/VMAT_H&N_03       | IMRT/VMAT_Breast_03 |
| lctp4         | IMRT/VMAT_Prostate_04 | IMRT/VMAT_Abdomen_04 | IMRT/VMAT_Lung_04 | IMRT/VMAT_Anal_04 | IMRT/VMAT_H&N_04       | IMRT/VMAT_Breast_04 |
| lctp5         | IMRT/VMAT_Prostate_05 | IMRT/VMAT_Abdomen_05 | IMRT/VMAT_Lung_05 | IMRT/VMAT_Anal_05 | IMRT/VMAT_H&N_05       | IMRT/VMAT_Breast_05 |
| lctp6         | IMRT/VMAT_Prostate_06 | IMRT/VMAT_Abdomen_06 | IMRT/VMAT_Lung_06 | IMRT/VMAT_Anal_06 | IMRT/VMAT_H&N_06       | IMRT/VMAT_Breast_06 |
| lctp7         | IMRT/VMAT_Prostate_07 | IMRT/VMAT_Abdomen_07 | IMRT/VMAT_Lung_07 | IMRT/VMAT_Anal_07 | IMRT/VMAT_H&N_07       | IMRT/VMAT_Breast_07 |
| lctp8         | IMRT/VMAT_Prostate_08 | IMRT/VMAT_Abdomen_08 | IMRT/VMAT_Lung_08 | IMRT/VMAT_Anal_08 | IMRT/VMAT_H&N_08       | IMRT/VMAT_Breast_08 |
| lctp9         | IMRT/VMAT_Prostate_09 | IMRT/VMAT_Abdomen_09 | IMRT/VMAT_Lung_09 | IMRT/VMAT_Anal_09 | IMRT/VMAT_H&N_09       | IMRT/VMAT_Breast_09 |
| lctp10        | IMRT/VMAT_Prostate_10 | IMRT/VMAT_Abdomen_10 | IMRT/VMAT_Lung_10 | IMRT/VMAT_Anal_10 | IMRT/VMAT_H&N_10       | IMRT/VMAT_Breast_10 |
| lctp11        | IMRT/VMAT_Prostate_11 | IMRT/VMAT_Abdomen_11 | IMRT/VMAT_Lung_11 | IMRT/VMAT_Anal_11 | IMRT/VMAT_H&N_11       | IMRT/VMAT_Breast_11 |
| lctp12        | IMRT/VMAT_Prostate_12 | IMRT/VMAT_Abdomen_12 | IMRT/VMAT_Lung_12 | IMRT/VMAT_Anal_12 | IMRT/VMAT_H&N_12       | IMRT/VMAT_Breast_12 |
| lctp13        | IMRT/VMAT_Prostate_13 | IMRT/VMAT_Abdomen_13 | IMRT/VMAT_Lung_13 | IMRT/VMAT_Anal_13 | IMRT/VMAT_H&N_13       | IMRT/VMAT_Breast_13 |
| lctp14        | IMRT/VMAT_Prostate_14 | IMRT/VMAT_Abdomen_14 | IMRT/VMAT_Lung_14 | IMRT/VMAT_Anal_14 | IMRT/VMAT_H&N_14       | IMRT/VMAT_Breast_14 |
| lctp15        | IMRT/VMAT_Prostate_15 | IMRT/VMAT_Abdomen_15 | IMRT/VMAT_Lung_15 | IMRT/VMAT_Anal_15 | IMRT/VMAT_H&N_15       | IMRT/VMAT_Breast_15 |