

PATIENT NAME	PATIENT ID	PATIENT POSITION	PLAN NAME / LABEL	DISEASE / COMMENTS
*PlanChallenge^SA, Plan Competition^	*plan 2016, LT BREAST	[Multiple Positions Detected]	Plan final A	(CURATIVE)
INSTITUTION	PLANNER NAME(S)	PHYSICIAN NAME(S)	PLAN DATE	PLANNING SYSTEM
	saldelaijan		20160311	ARIA RadOnc 13.6.30 (Varian Medical S

## Abstract

This report is a summary of the following data imported for patient [\*plan 2016, LT BREAST] \*PlanChallenge^SA, Plan Competition^FEB-2016:

RT Plan: RP.1.2.246.352.71.5.584747638204.892006.20160310234332.dcm

RT Structure Set: RS.1.2.246.352.205.4809628519830722234.5161301210899913089.dcm

RT Dose: RD.1.2.246.352.71.7.584747638204.1622065.20160311001507.dcm [Varian Medical Systems, ARIA RadOnc]

----- DICOM Detective: Inconsistencies Found -----

Inconsistency in Patient ID: plan 2016 [RT Plan] LT BREAST [RT Structure Set] plan 2016 [RT Dose] LT BREAST [CT Imageset]

Inconsistency in Study ID: PlanChallenge16 [RT Plan] 1 [RT Structure Set] PlanChallenge16 [RT Dose] 1 [CT Imageset]

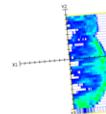
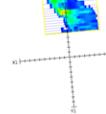
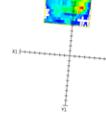
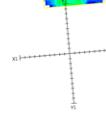
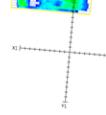
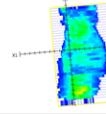
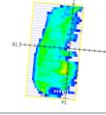
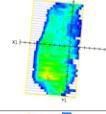
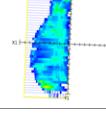
Inconsistency in Plan <-> Structure Set: The current RT Plan does not reference the SOP Instance UID of the current RT Structure Set.

This report includes a Plan Quality analysis using Plan Quality Algorithm: 2016 Dosimetric Criteria Sheet.

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**Beam Summary**

Beam Details	Geometry (IEC)	Modifiers	BEV	# CPs	Meterset
[1] Name: Field 1 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 293.9-to-75 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: 0.00 mm, X2: 81.98 mm [Y Jaws] Y1: -111.00 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)		98	282.818 MU
[3] Name: Field 3 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 287-to-46 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -44.00 mm, X2: 64.00 mm [Y Jaws] Y1: 49.00 mm, Y2: 131.00 mm Multi-Leaf Collimation (X)		98	245.993 MU
[4] Name: Field 4 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 179.6-to-67.9 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -57.00 mm, X2: 34.00 mm [Y Jaws] Y1: 61.00 mm, Y2: 132.50 mm Multi-Leaf Collimation (X)		98	385.218 MU
[5] Name: Field 5 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 288-to-131.5 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -42.00 mm, X2: 79.48 mm [Y Jaws] Y1: 95.00 mm, Y2: 172.50 mm Multi-Leaf Collimation (X)		114	426.292 MU
[6] Name: Field 6 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 333.7-to-109 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -124.48 mm, X2: 34.00 mm [Y Jaws] Y1: 77.50 mm, Y2: 152.50 mm Multi-Leaf Collimation (X)		98	374.818 MU
[7] Name: Field 7 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 295.4-to-75 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -32.00 mm, X2: 81.98 mm [Y Jaws] Y1: -111.00 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)		98	246.077 MU
[8] Name: Field 8 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 170.1-to-82 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -79.48 mm, X2: 21.00 mm [Y Jaws] Y1: -102.50 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)		66	299.918 MU
[9] Name: Field 9 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 172.7-to-82 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -79.48 mm, X2: 21.00 mm [Y Jaws] Y1: -102.50 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)		98	245.341 MU
[10] Name: Field 10 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 179.9-to-95 Collimator (deg): 357.8 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,325,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -87.00 mm, X2: 0.00 mm [Y Jaws] Y1: -109.00 mm, Y2: 150.00 mm Multi-Leaf Collimation (X)		66	215.984 MU

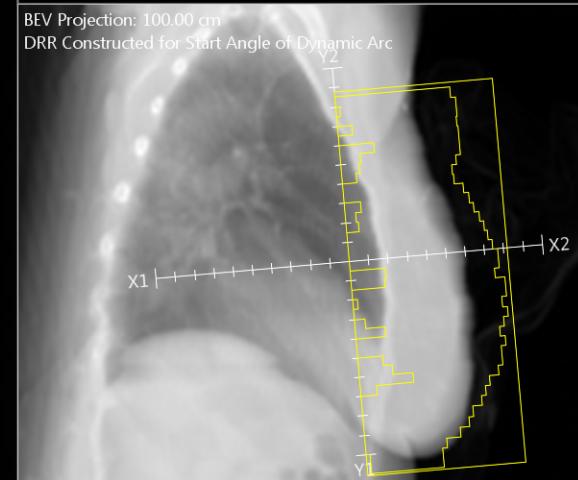
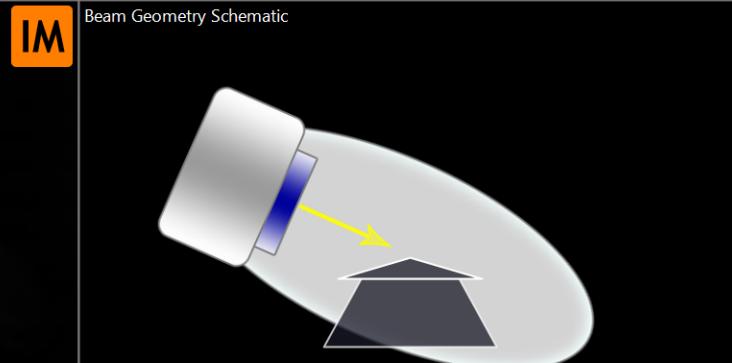
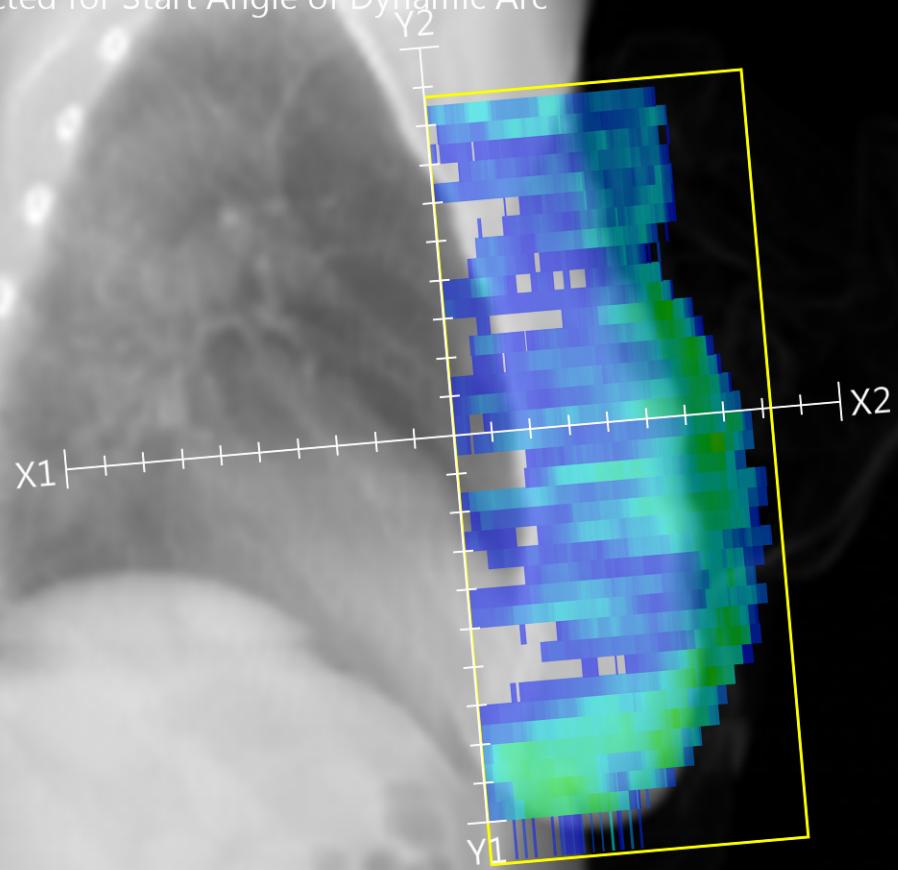
NOTE: "VMAT" label(s) derived from: 1) usage of MLC and 2) multi-segmented arc.

**Totals:** 834 CPs 2722.5 MU

**Beam Summary [Number: 1, Name: Field 1]**

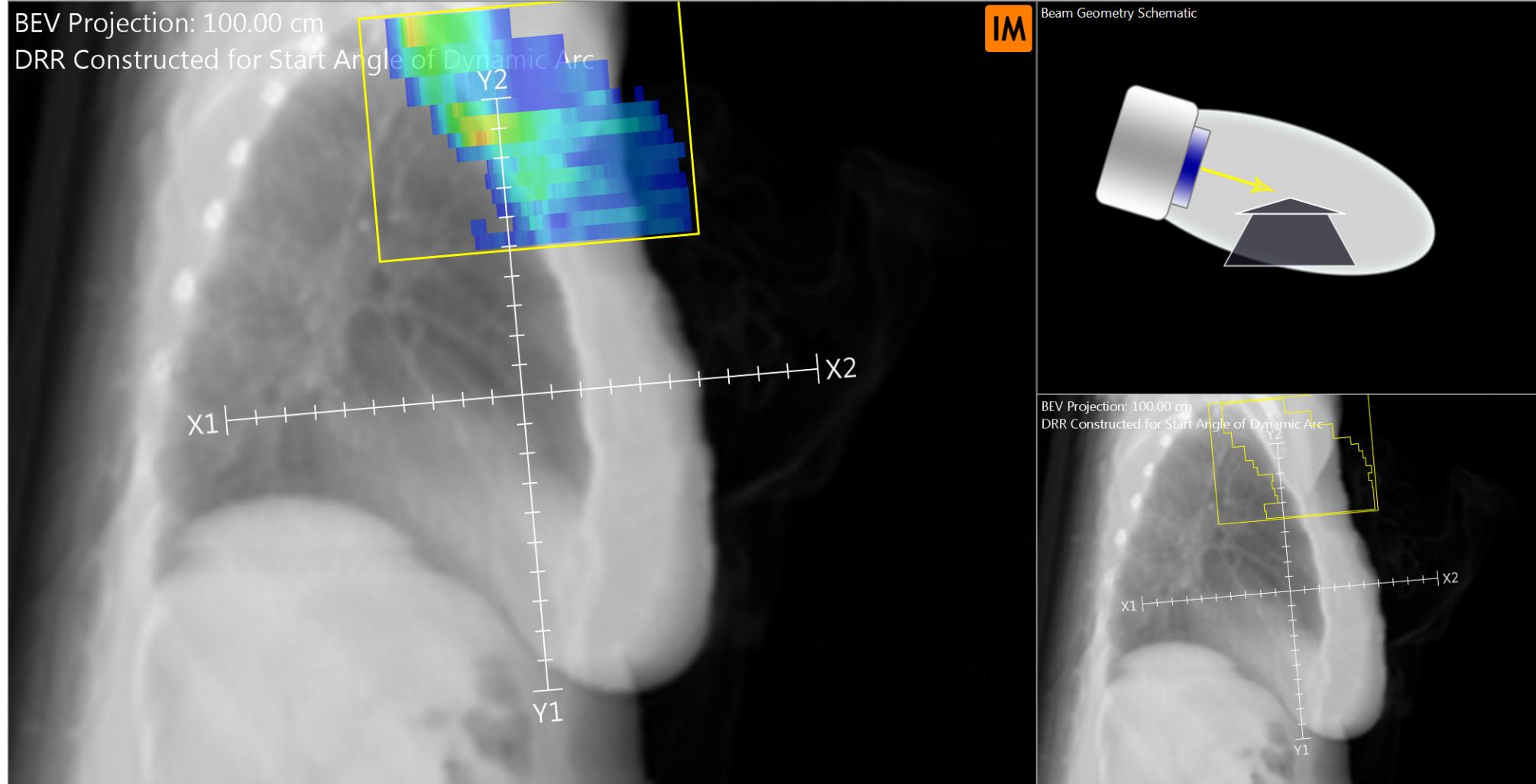
Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[1] Name: Field 1 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 293.9-to-75 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: 0.00 mm, X2: 81.98 mm [Y Jaws] Y1: -111.00 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)	98	282.818 MU

BEV Projection: 100.00 cm  
DRR Constructed for Start Angle of Dynamic Arc



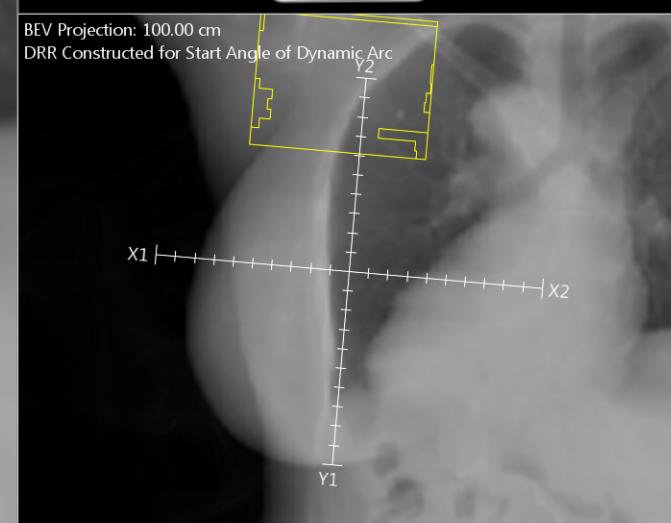
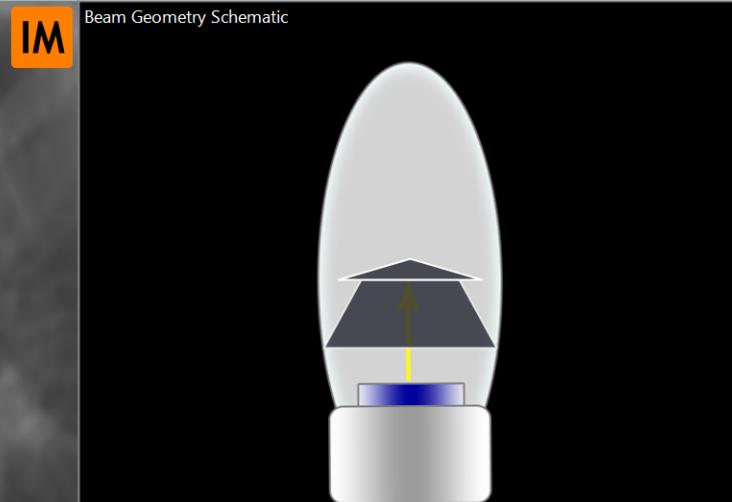
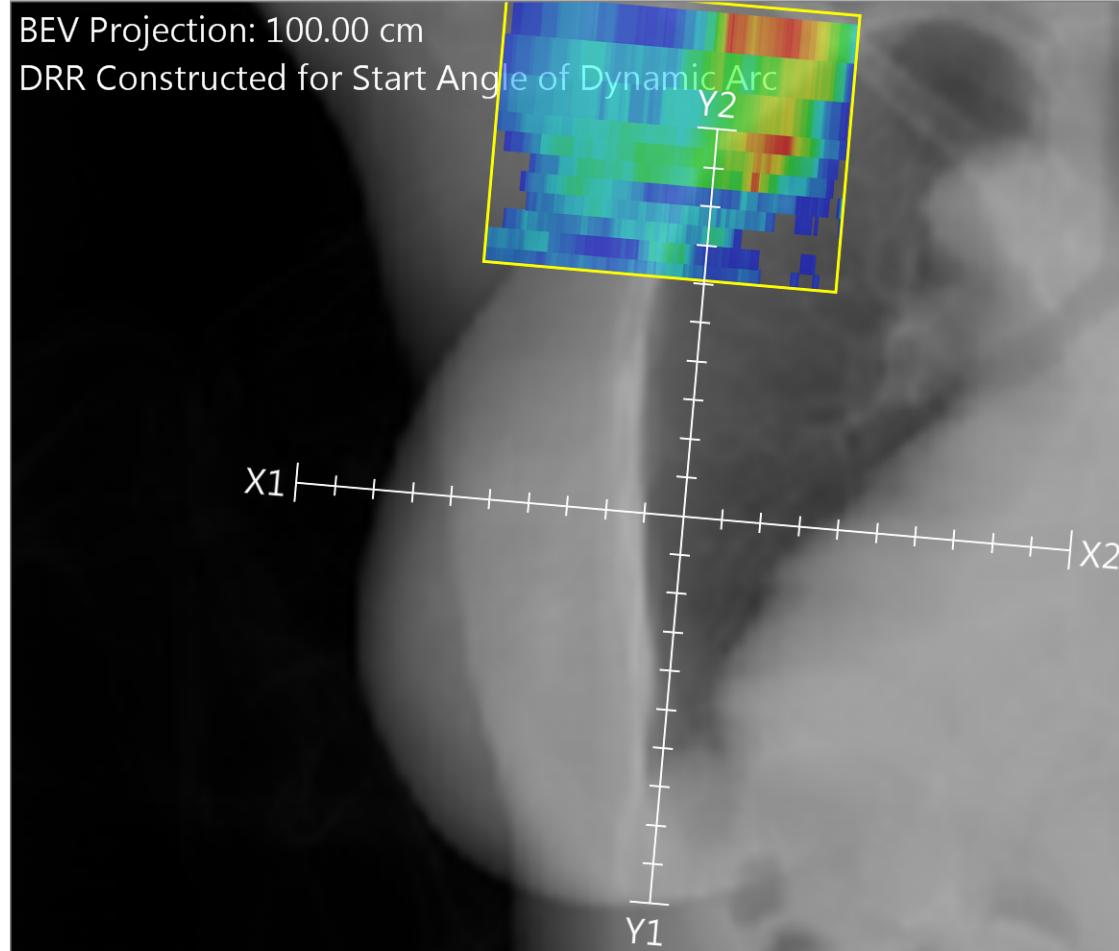
**Beam Summary [Number: 3, Name: Field 3]**

Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[3] Name: Field 3 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 287-to-46 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -44.00 mm, X2: 64.00 mm [Y Jaws] Y1: 49.00 mm, Y2: 131.00 mm Multi-Leaf Collimation (X)	98	245.993 MU



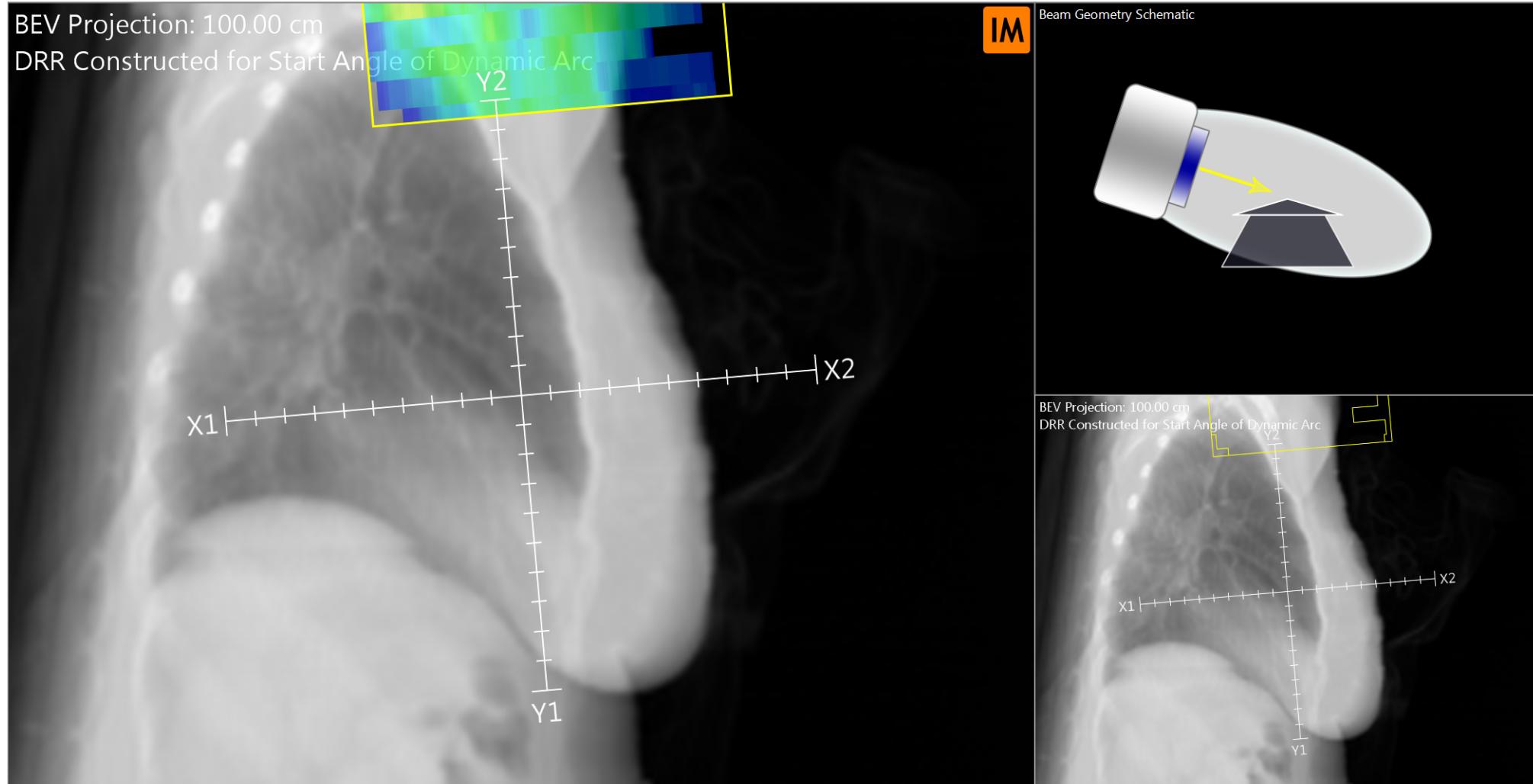
**Beam Summary [Number: 4, Name: Field 4]**

Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[4] Name: Field 4 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 179.6-to-67.9 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -57.00 mm, X2: 34.00 mm [Y Jaws] Y1: 61.00 mm, Y2: 132.50 mm Multi-Leaf Collimation (X)	98	385.218 MU



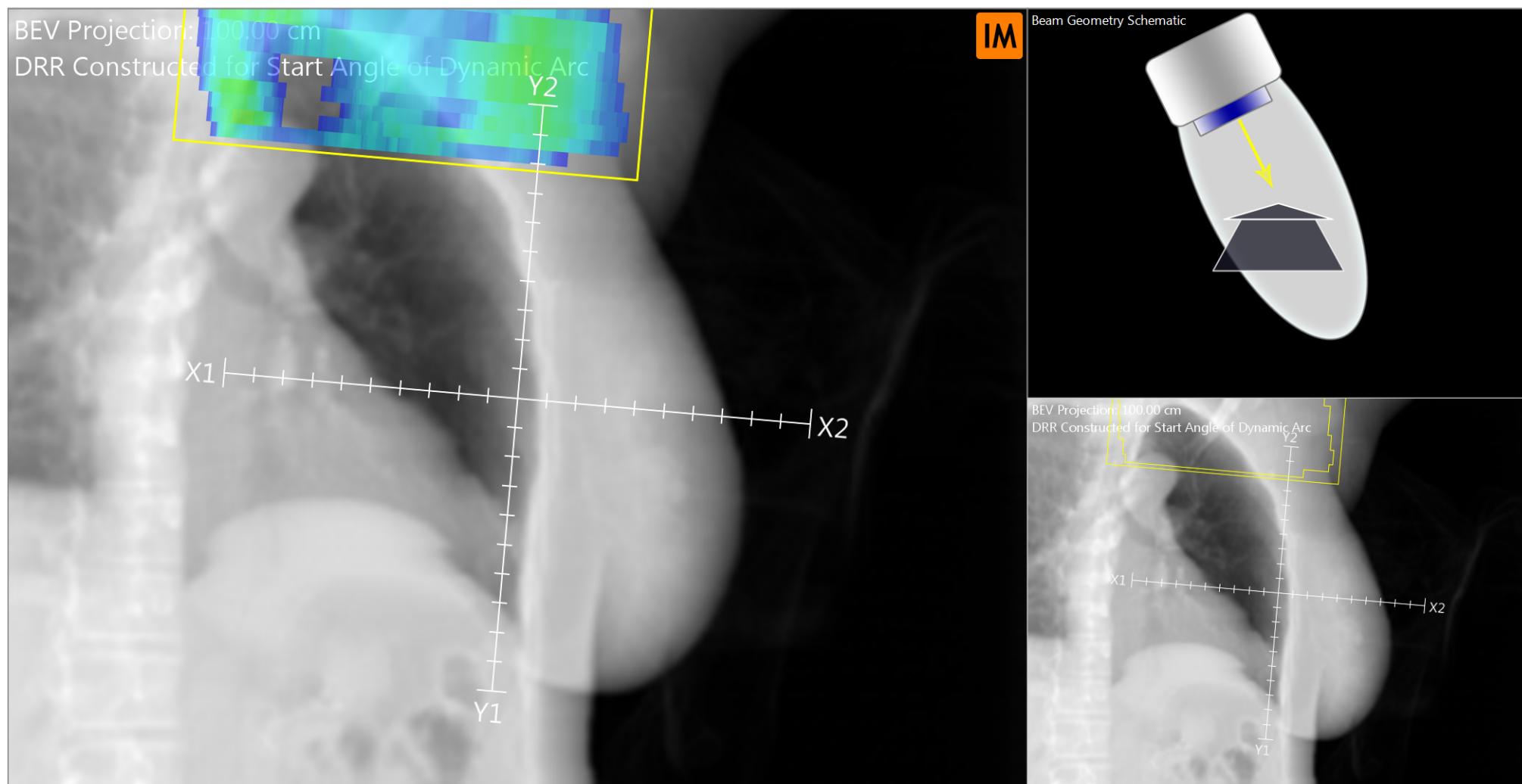
**Beam Summary [Number: 5, Name: Field 5]**

Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[5] Name: Field 5 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 288-to-131.5 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -42.00 mm, X2: 79.48 mm [Y Jaws] Y1: 95.00 mm, Y2: 172.50 mm Multi-Leaf Collimation (X)	114	426.292 MU



**Beam Summary [Number: 6, Name: Field 6]**

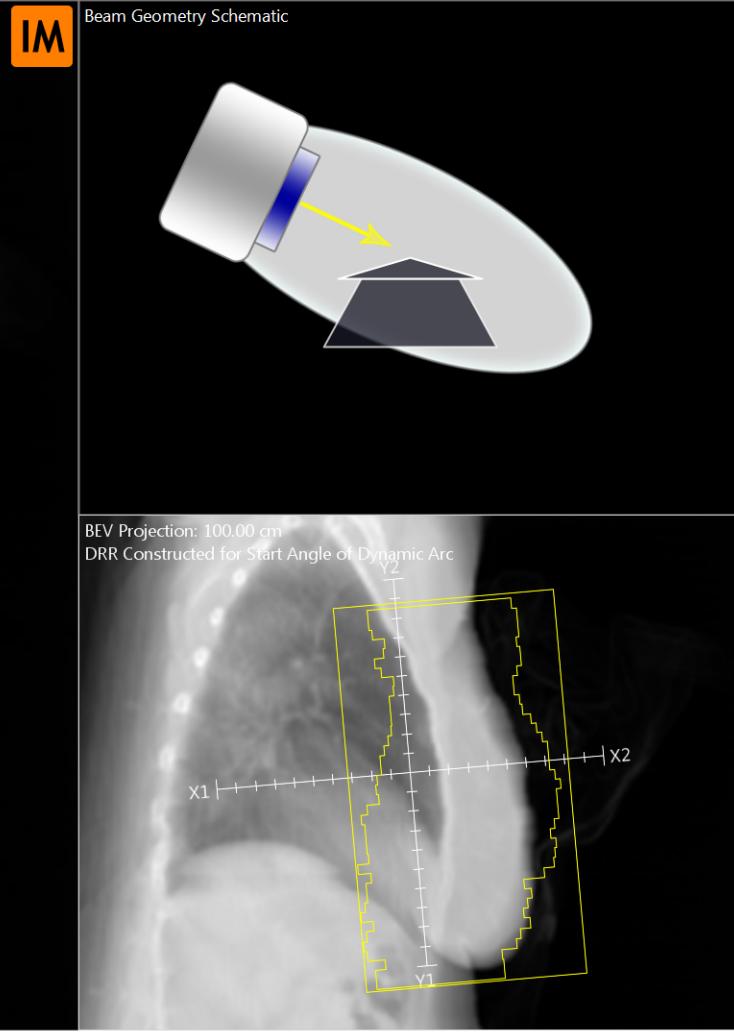
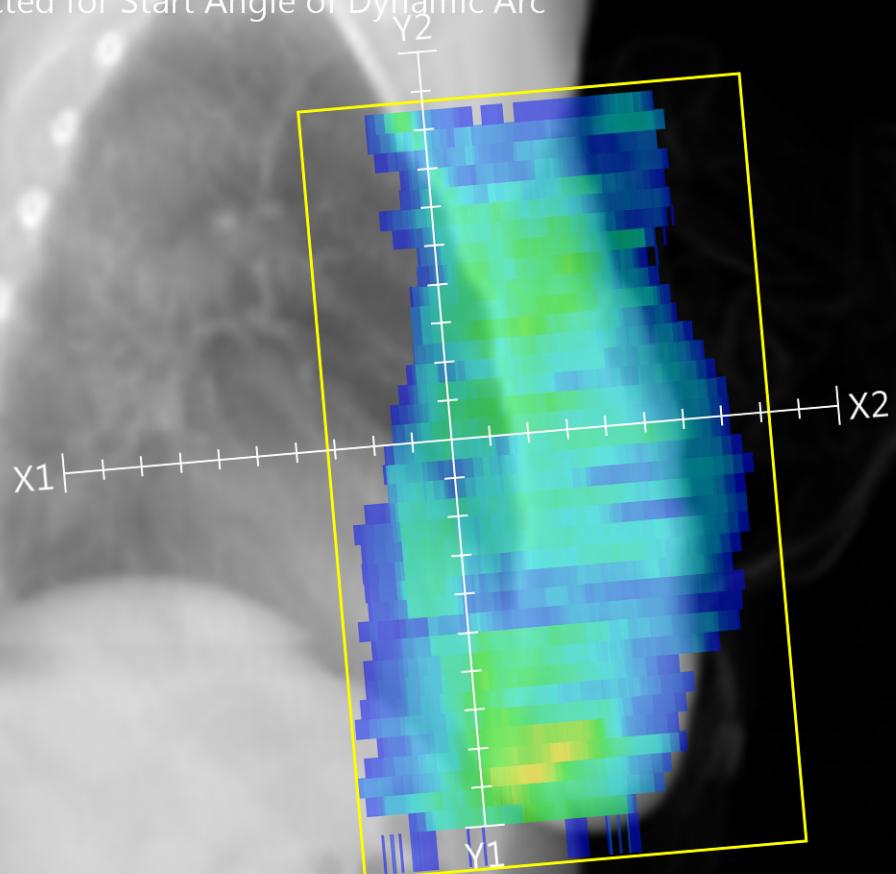
Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[6] Name: Field 6 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 333.7-to-109 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -124.48 mm, X2: 34.00 mm [Y Jaws] Y1: 77.50 mm, Y2: 152.50 mm Multi-Leaf Collimation (X)	98	374.818 MU



**Beam Summary [Number: 7, Name: Field 7]**

Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[7] Name: Field 7 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CW Gantry Start-to-End (deg): 295.4-to-75 Collimator (deg): 5 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -32.00 mm, X2: 81.98 mm [Y Jaws] Y1: -111.00 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)	98	246.077 MU

BEV Projection: 100.00 cm  
DRR Constructed for Start Angle of Dynamic Arc

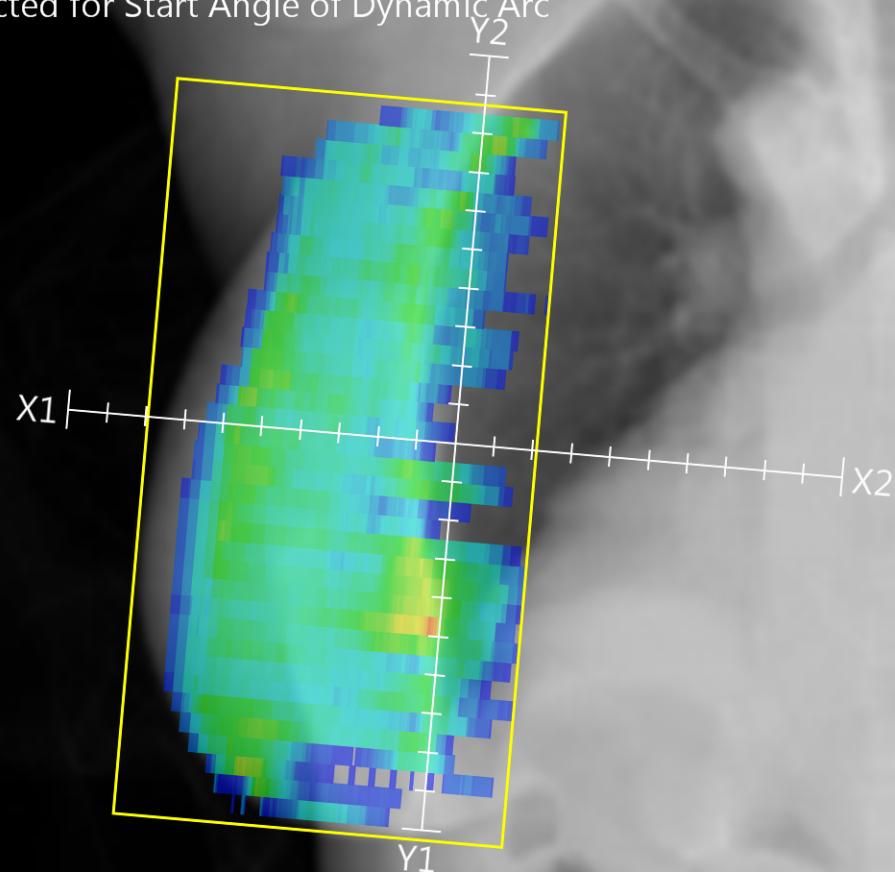


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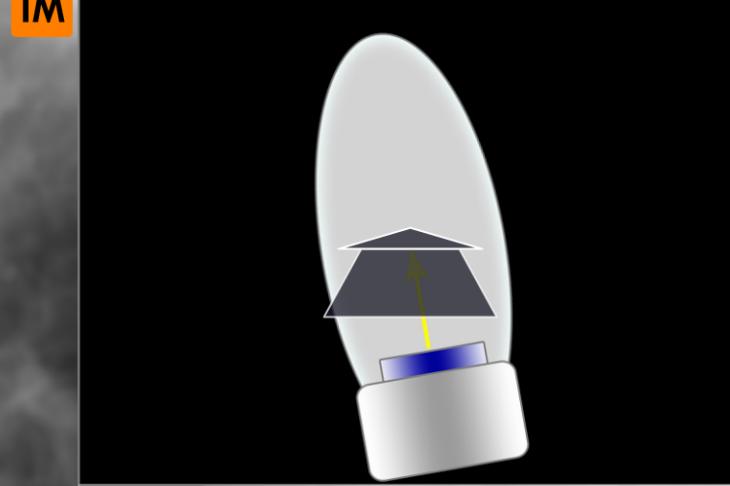
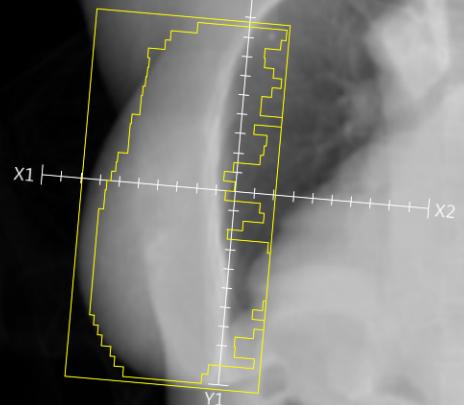
Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[8] Name: Field 8 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 170.1-to-82 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -79.48 mm, X2: 21.00 mm [Y Jaws] Y1: -102.50 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)	66	299.918 MU

BEV Projection: 100.00 cm

DRR Constructed for Start Angle of Dynamic Arc



Beam Geometry Schematic

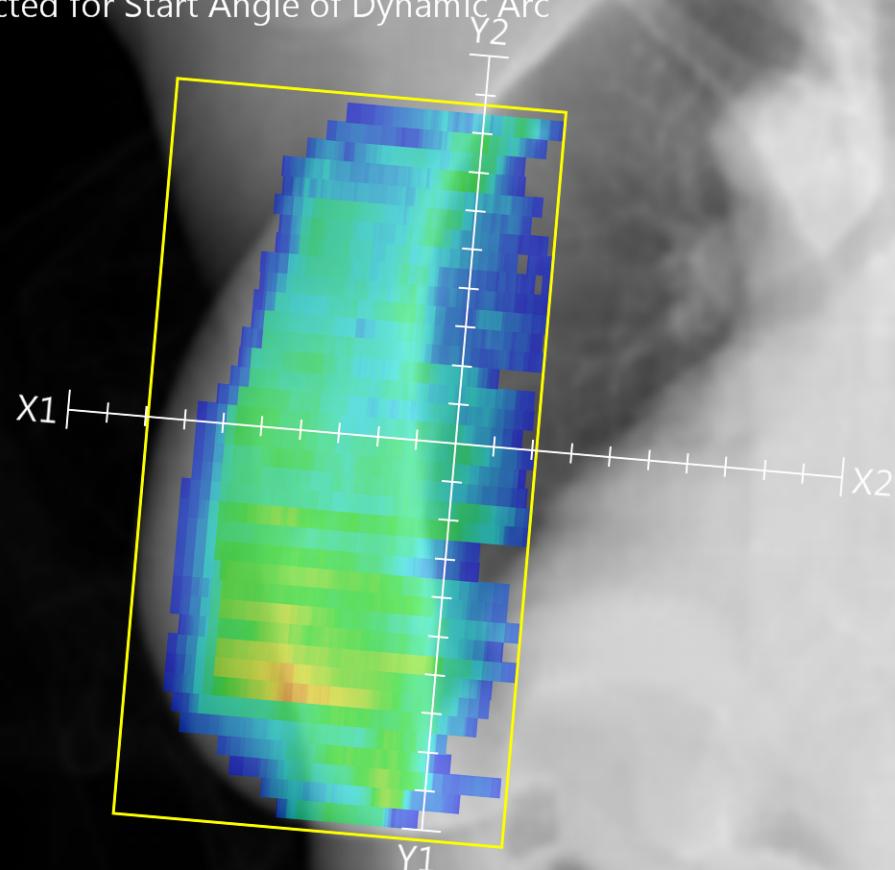
BEV Projection: 100.00 cm  
DRR Constructed for Start Angle of Dynamic Arc

**Beam Summary [Number: 9, Name: Field 9]**

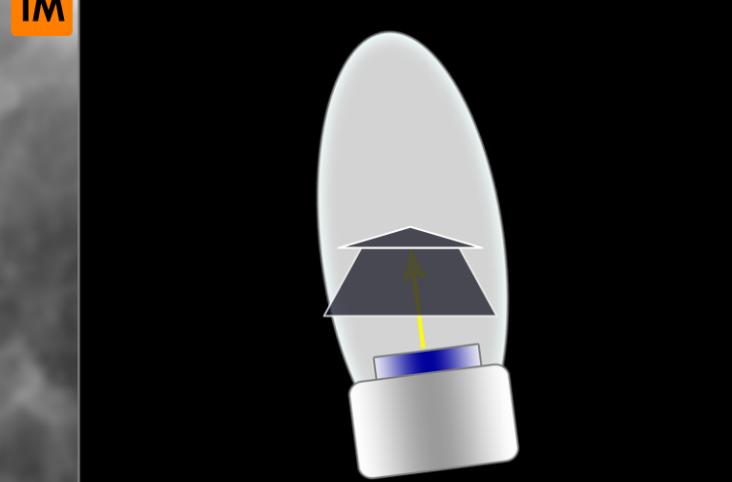
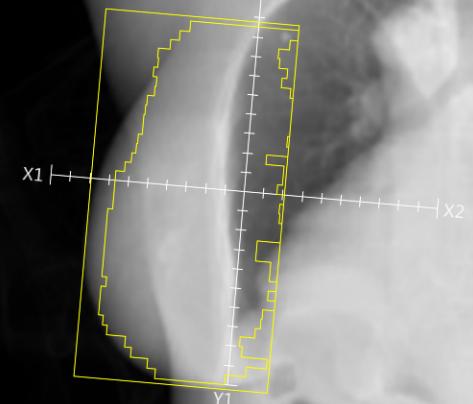
Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[9] Name: Field 9 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 172.7-to-82 Collimator (deg): 355 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -79.48 mm, X2: 21.00 mm [Y Jaws] Y1: -102.50 mm, Y2: 87.50 mm Multi-Leaf Collimation (X)	98	245.341 MU

BEV Projection: 100.00 cm

DRR Constructed for Start Angle of Dynamic Arc

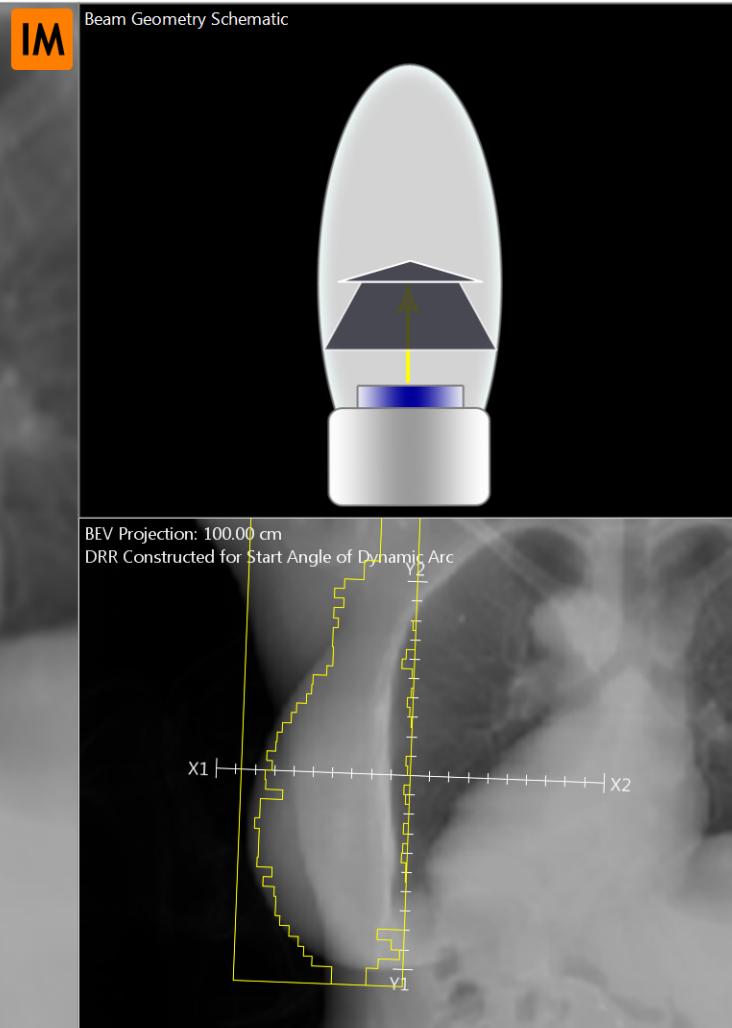
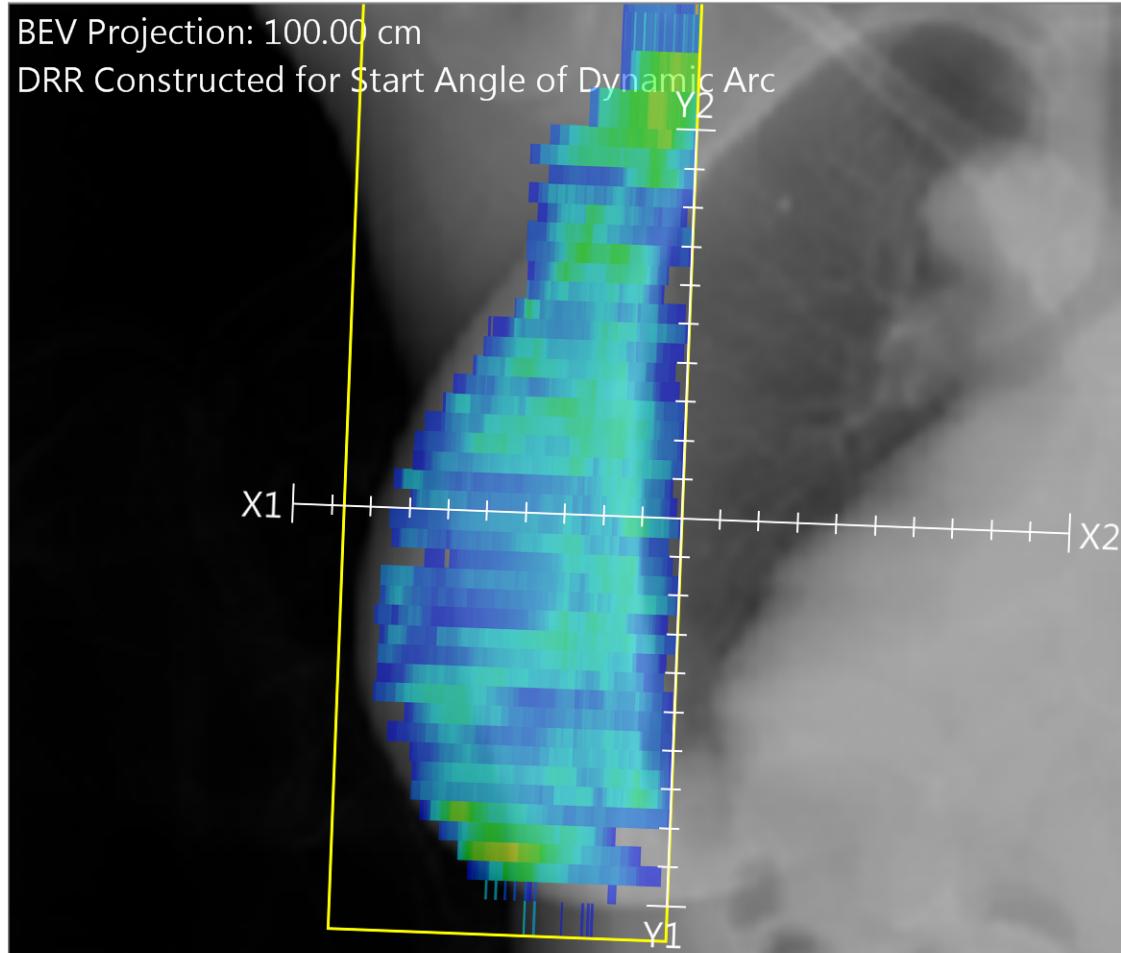


Beam Geometry Schematic

BEV Projection: 100.00 cm  
DRR Constructed for Start Angle of Dynamic Arc

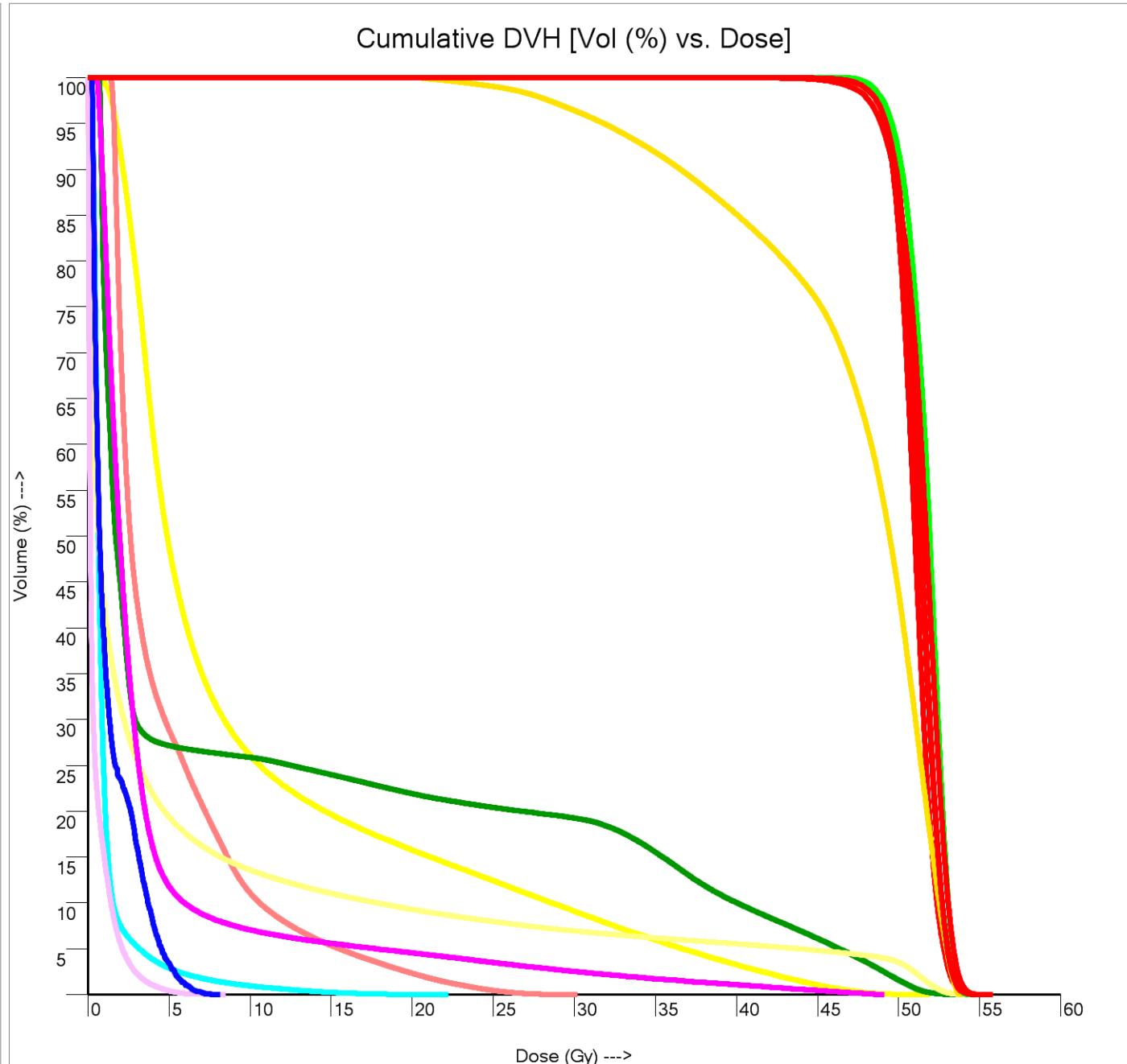
**Beam Summary [Number: 10, Name: Field 10]**

Beam Details	Geometry (IEC)	Modifiers	# CPs	Meterset
[10] Name: Field 10 Type: Photon Treatment (VMAT) Machine: TrueBeamSN1266, Energy: 6 MV # Fractions: 25 (Fx Group 1)	Gantry Motion: CCW Gantry Start-to-End (deg): 179.9-to-95 Collimator (deg): 357.8 Couch (deg): 0 Isocenter [DICOM] (mm): (111.6,32.5,-80.4) Isocenter [Couch] (mm): (0.0,0.0,0.0)	[X Jaws] X1: -87.00 mm, X2: 0.00 mm [Y Jaws] Y1: -109.00 mm, Y2: 150.00 mm Multi-Leaf Collimation (X)	66	215.984 MU



**DVH Summary**

<u>Structure (Vol)</u>	<u>Min; Mean; Max (Gy)</u>
BODY (27517.5cc)	0.00; 5.54; 55.80
BREAST_RIGHT (889.9cc)	0.00; 0.47; 8.51
CTV-LUMPECTOMY (40.4cc)	45.83; 51.75; 54.39
ESOPHAGUS (22.2cc)	0.65; 10.35; 53.69
HEART (688.0cc)	0.49; 3.90; 49.13
LARYNX (14.1cc)	1.35; 4.76; 30.19
LUNG_LEFT (1177.0cc)	0.70; 9.75; 51.95
LUNG_RIGHT (1345.3cc)	0.06; 1.04; 22.23
PTV_AXILL (146.1cc)	42.03; 51.00; 55.46
PTV_BREAST (877.9cc)	42.92; 51.31; 55.80
PTV_SC (42.5cc)	35.73; 51.51; 55.12
PTV_TOT_EVAL (1090.6cc)	41.71; 51.24; 55.80
SPINAL CORD (51.4cc)	0.23; 1.38; 8.14
THYROID (3.3cc)	20.18; 46.96; 53.94



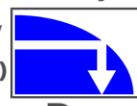
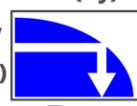
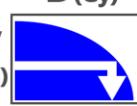
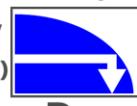
**Plan Quality Scoresheet: 2016 Dosimetric Criteria Sheet**

This is the Plan Quality results spreadsheet for Plan Quality Algorithm: 2016 Dosimetric Criteria Sheet.

Raw PQM / Max PQM: 88.59 / 100.00 PQM (%): 88.6%

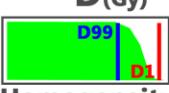
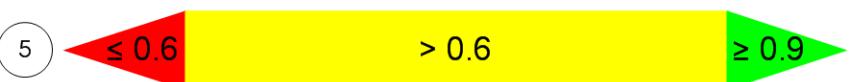
Plan Quality Metric Component	Objective(s)	Result	Raw Score	Max Score	Performance
[PTV_TOT_EVAL] D[99.0%] (Gy)	> 45 [ $\geq$ 47.5]	47.8384	15.00	15.00	100.0%
[PTV_TOT_EVAL] D[95.0%] (Gy)	> 45 [ $\geq$ 50]	49.2207	4.22	5.00	84.4%
[PTV_TOT_EVAL] D[50.0%] (Gy)	< 54 [ $\leq$ 52]	51.3177	5.00	5.00	100.0%
[PTV_TOT_EVAL] D[0.3cc] (Gy)	< 57 [ $\leq$ 55]	54.6899	5.00	5.00	100.0%
[HEART] Mean dose (Gy)	< 5 [ $\leq$ 4]	3.9018	10.00	10.00	100.0%
[HEART] V[15.0Gy] (%)	< 20 [ $\leq$ 15]	5.5774	5.00	5.00	100.0%
[HEART] D[5.0%] (Gy)	< 25 [ $\leq$ 20]	17.7491	5.00	5.00	100.0%
[BREAST_RIGHT] D[0.3cc] (Gy)	< 3 [ $\leq$ 2]	7.3100	0.00	2.00	0.0%
[BREAST_RIGHT] D[5.0%] (Gy)	< 3 [ $\leq$ 2]	2.1143	3.54	4.00	88.6%
[SPINAL CORD] D[0.03cc] (Gy)	< 20 [ $\leq$ 8]	7.5560	5.00	5.00	100.0%
[LUNG_RIGHT] V[5.0Gy] (%)	< 6 [ $\leq$ 3]	2.8963	5.00	5.00	100.0%
[LUNG_LEFT] Mean dose (Gy)	< 15 [ $\leq$ 9]	9.7530	4.37	5.00	87.5%
[LUNG_LEFT] V[20.0Gy] (%)	< 20 [ $\leq$ 15]	15.7463	4.25	5.00	85.1%
[LUNG_LEFT] V[10.0Gy] (%)	< 40 [ $\leq$ 30]	26.1116	5.00	5.00	100.0%
[LUNG_LEFT] V[5.0Gy] (%)	< 70 [ $\leq$ 50]	48.7731	4.00	4.00	100.0%
[PTV_TOT_EVAL] Homogeneity Index [50.0Gy]	< 0.2 [ $\leq$ 0.08]	0.1157	3.22	5.00	64.3%
[PTV_TOT_EVAL] Conformation Number [47.5Gy]	> 0.6 [ $\geq$ 0.9]	0.8987	4.99	5.00	99.7%
Global Max Location (ROI)	[CTV_LUMPECTOMY]	Elsewhere	0.00	5.00	0.0%
Total [18 Metrics]			88.59	100.00	88.6%

## Plan Quality Algorithm: 2016 Dosimetric Criteria Sheet [100 Max Possible] [18 Metrics] (Page 1 of 2)

1		Dose (Gy) covering 99 (%) of the PTV_TOT_EVAL
2		Dose (Gy) covering 95 (%) of the PTV_TOT_EVAL
3		Dose (Gy) covering 50 (%) of the PTV_TOT_EVAL
4		Dose (Gy) covering 0.3 (cc) of the PTV_TOT_EVAL
5	 	Mean dose (Gy) inside the HEART
6		Volume (%) of the HEART covered by 15 (Gy)
7		Dose (Gy) covering 5 (%) of the HEART
8		Dose (Gy) covering 0.3 (cc) of the BREAST_RIGHT
9		Dose (Gy) covering 5 (%) of the BREAST_RIGHT
10		Dose (Gy) covering 0.03 (cc) of the SPINAL CORD



## Plan Quality Algorithm: 2016 Dosimetric Criteria Sheet [100 Max Possible] [18 Metrics] (Page 2 of 2)

<b>11</b>		Volume (%) of the LUNG_RIGHT covered by 5 (Gy)	
<b>12</b>		Mean dose (Gy) inside the LUNG_LEFT	
<b>13</b>		Volume (%) of the LUNG_LEFT covered by 20 (Gy)	
<b>14</b>		Volume (%) of the LUNG_LEFT covered by 10 (Gy)	
<b>15</b>		Volume (%) of the LUNG_LEFT covered by 5 (Gy)	
<b>16</b>		[Dose covering 1% of the PTV_TOT_EVAL - Dose covering 99% of the PTV_TOT_EVAL] (Gy) / [Prescription 50 (Gy)]	
<b>17</b>		[The PTV_TOT_EVAL's volume (cc) covered by 47.5 (Gy)] <sup>2</sup> / [Total volume (cc) covered by 47.5 (Gy) x Total volume (cc) of the PTV_TOT_EVAL]	
<b>18</b>		Location of the global maximum dose point, in terms of the ROI(s) specified in the score function	