Tomotherapy and Patient QA (Part 2)

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Medical Physicist

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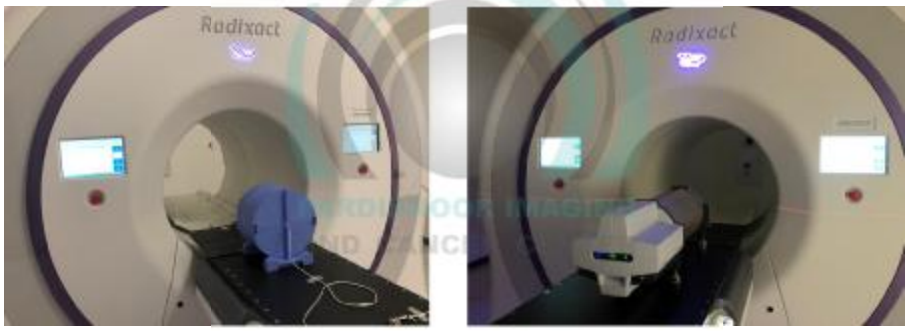
Tomo Patient Specific QA

Cheese Phantom **Delta4+ Phantom**



2

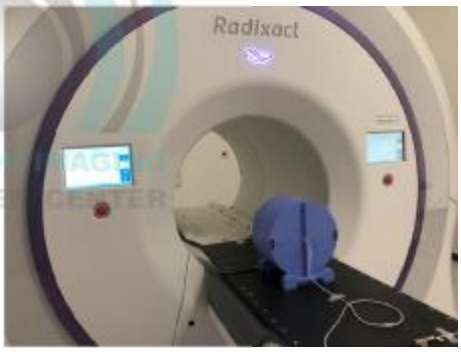
Tomo Patient Specific QA (Cheese Phantom)

Standard Imaging A15L
"Slimline Miniature Shonka Chamber"

3

Tomo Patient Specific QA (Cheese Phantom)

- **It is Possible to measure 8 points in one radiation ,but it's not practical.**
- **Measure the dose in horizantal and vertical direction of phantom's center.**



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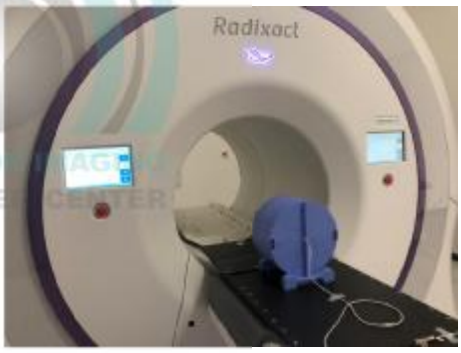
Tomo Patient Specific QA (Cheese Phantom)

- **It is Possible to measure the dose distribution on the film.**



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Other Uses

- CT number calibration

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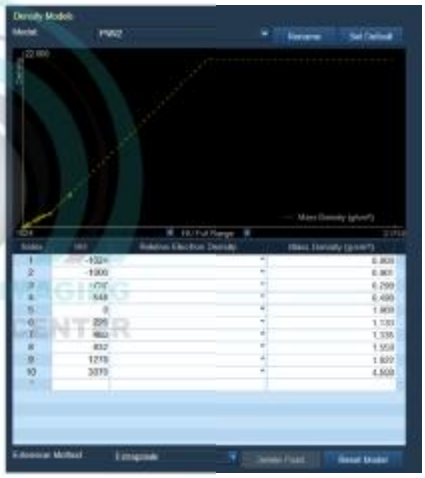
Other Uses

- HU-Density Curve



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Tomo Patient Specific QA

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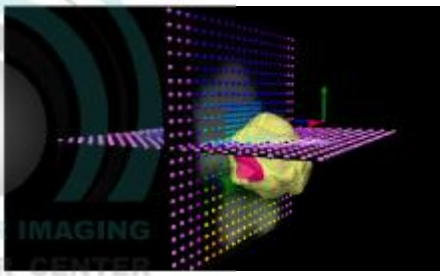
Tomo Patient Specific QA (Delta4+ Phantom)

1069 P-type Diods



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Tomo Patient Specific QA (Delta4+ Phantom)

Distance between detectors	
Central area (6 x 6cm2)	5 mm (or 2.5 mm in longitudinal direction with merging of two consecutive measurements)
Outer area	10 mm
Size (radial x axial)	1 x 0.05mm3= 0.00004 cm3
Max field size	20 x 38 cm2 (when merging two consecutive measurements, otherwise 20 x 20 cm2)

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Create a Patient QA in Delta4 Phantom

Create a new Plan

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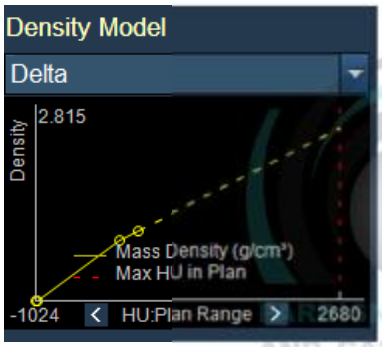
Density Model
Delta
2.815
Density
Mass Density (g/cm³)
Max HU in Plan
-1024
HU:Plan Range
2680

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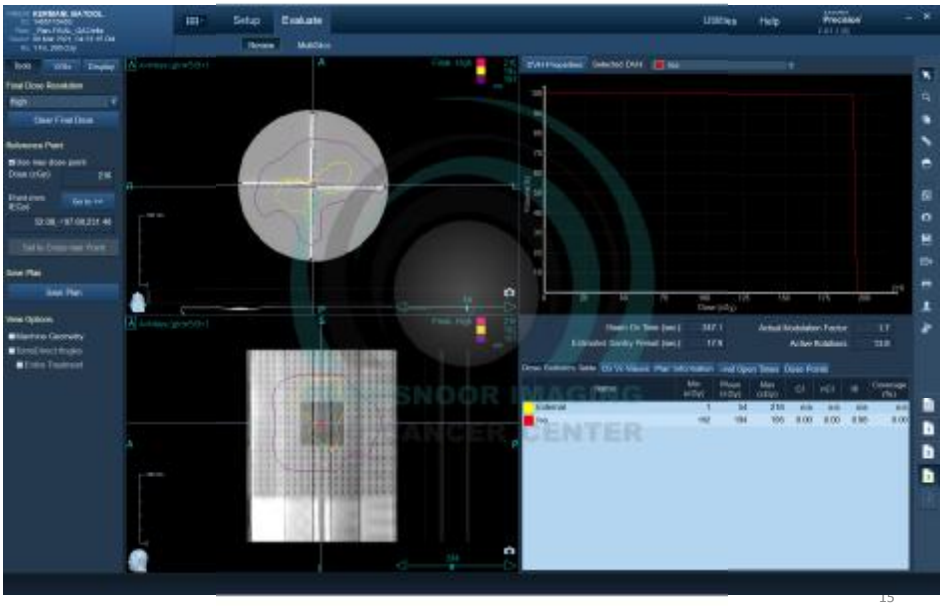

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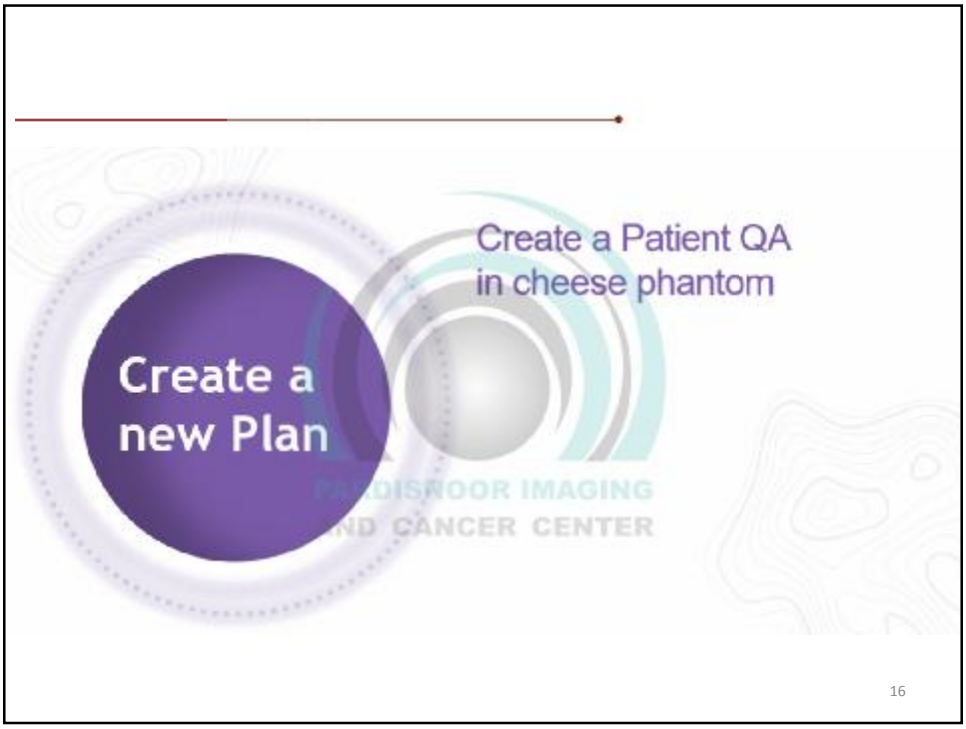

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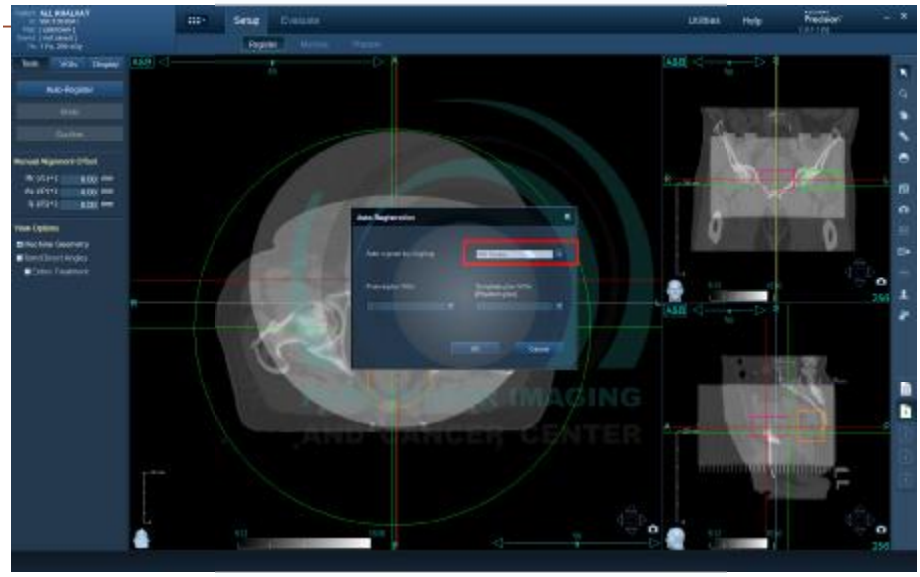

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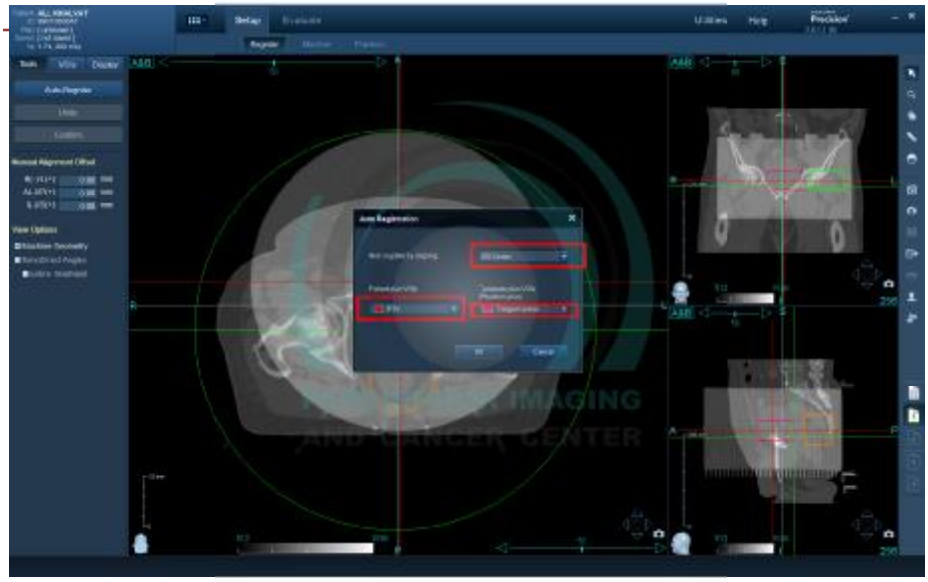

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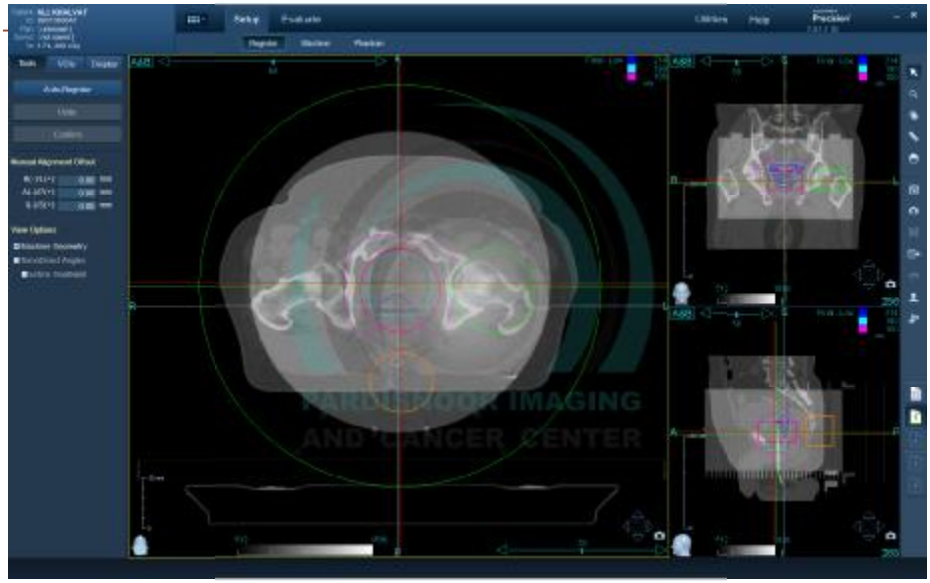

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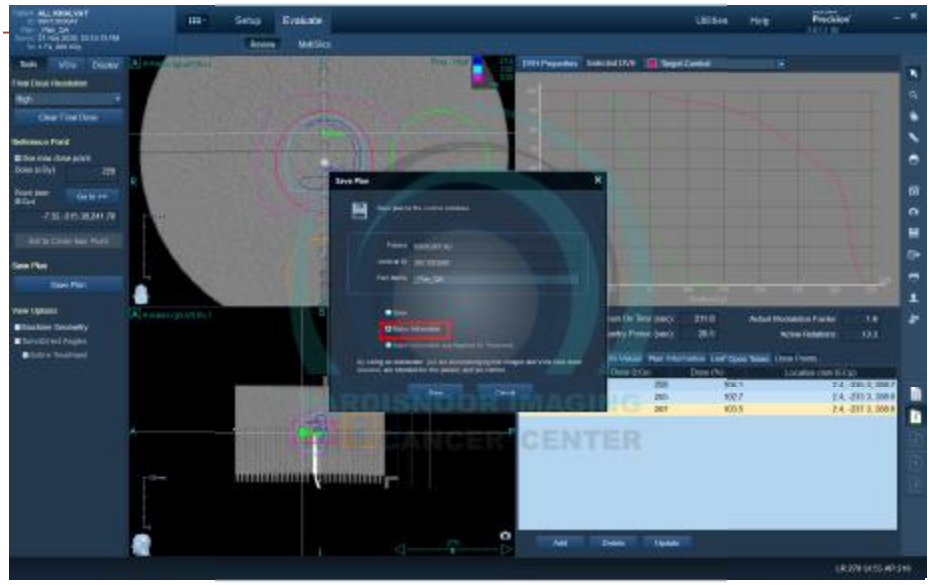

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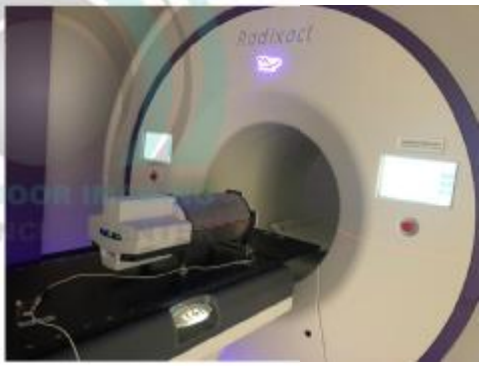
Patient Specific QA

What We need to do before Using Delta4+ for Tomo Patients QAs:

- Delta4 Phantom+ calibration:
  1) Relative
  2) Directional
  3) Reference
  4) Absolute



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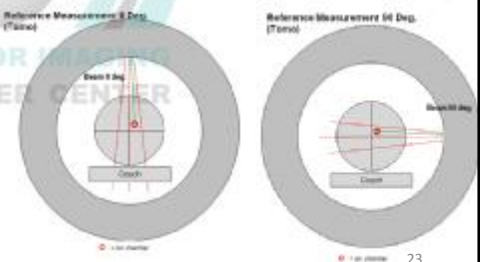
Patient Specific QA

What We Did to Use Delta4+ for Tomo Patients:

- Delta4 Phantom+ calibration:
  1) Relative
  2) Directional
  3) Reference
  4) Absolute



Field Size: 20 x 5 cm field static beam
Gantry: 0 and 90 degree
Beam duration: 60 S

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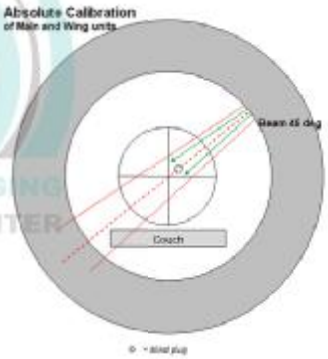
Patient Specific QA

What We Did to Use Delta4+ for Tomo Patients:

- Delta4 Phantom+ calibration:
  1) Relative
  2) Directional
  3) Reference
  4) Absolute



Field Size: 20 x 5 cm field static beam
Gantry: 45 degree
Beam duration: 60 S

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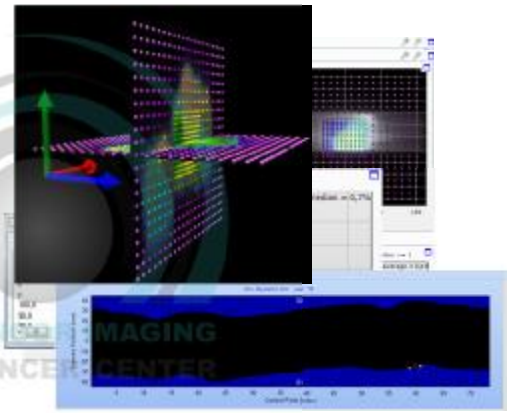
Delta4+ Software Capabilities

- Algorithms
  - 3D Gamma,
  - 3D DTA,
  - Dose deviation
- Display
  - 3D,
  - 2D,
  - 1D
  - Histograms
  - Tables
  - Together with Patient structures



ScandiDos

Patient Specific QA

Case #1

- 47 years female
- Oral Tongue
- LN positive
- CTV54 – CTV60 – CTV64
- Duration: 240 sec

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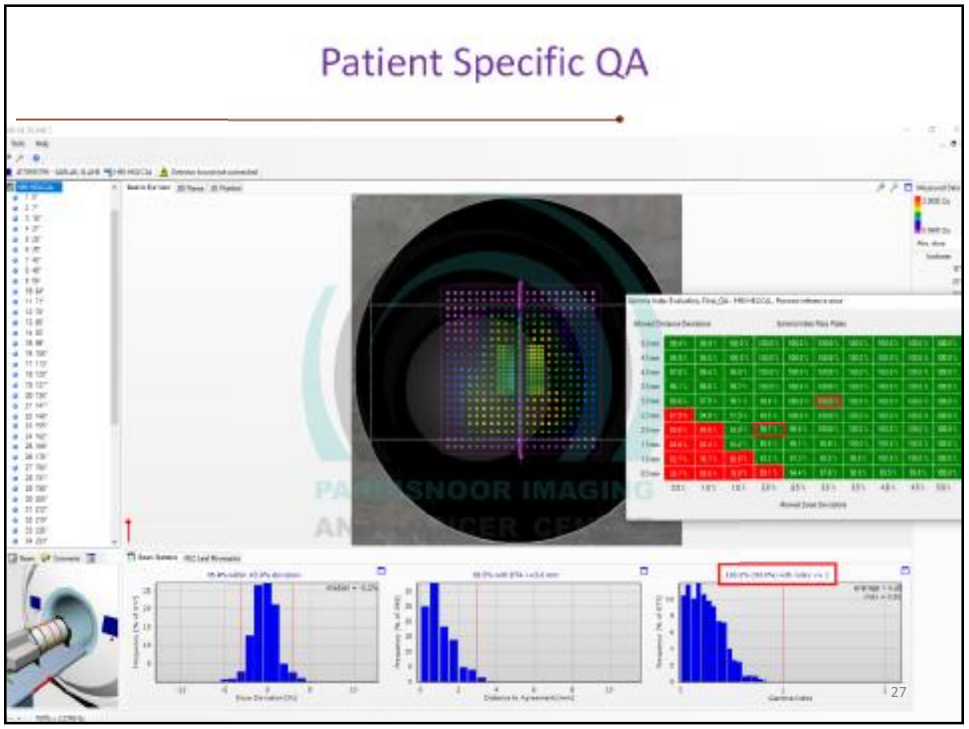
Patient Specific QA
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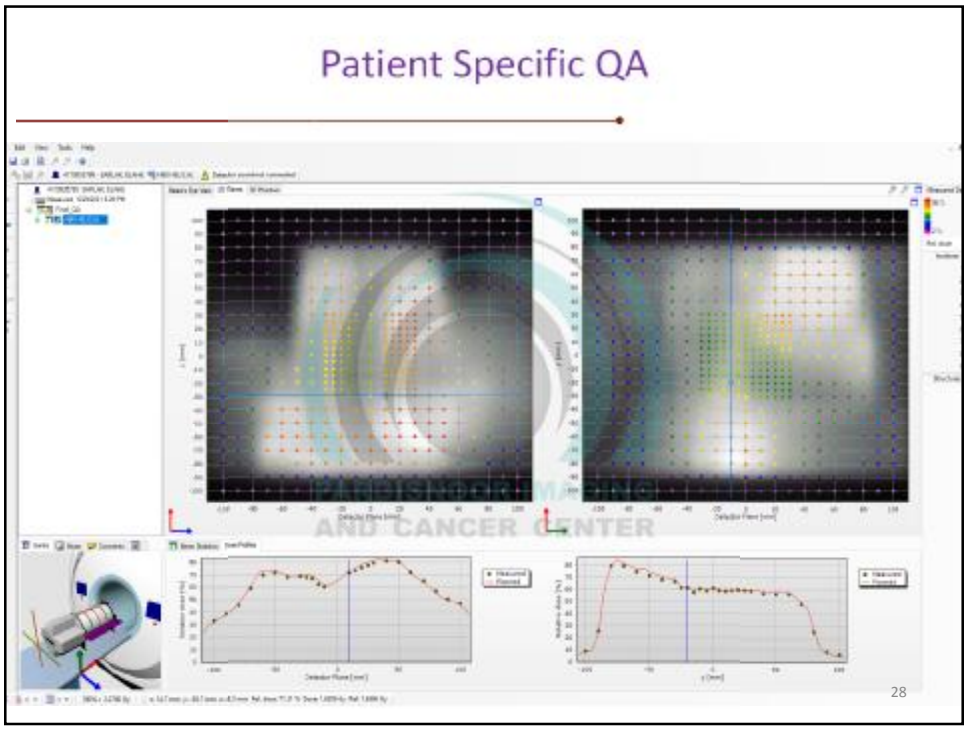
Patient Specific QA
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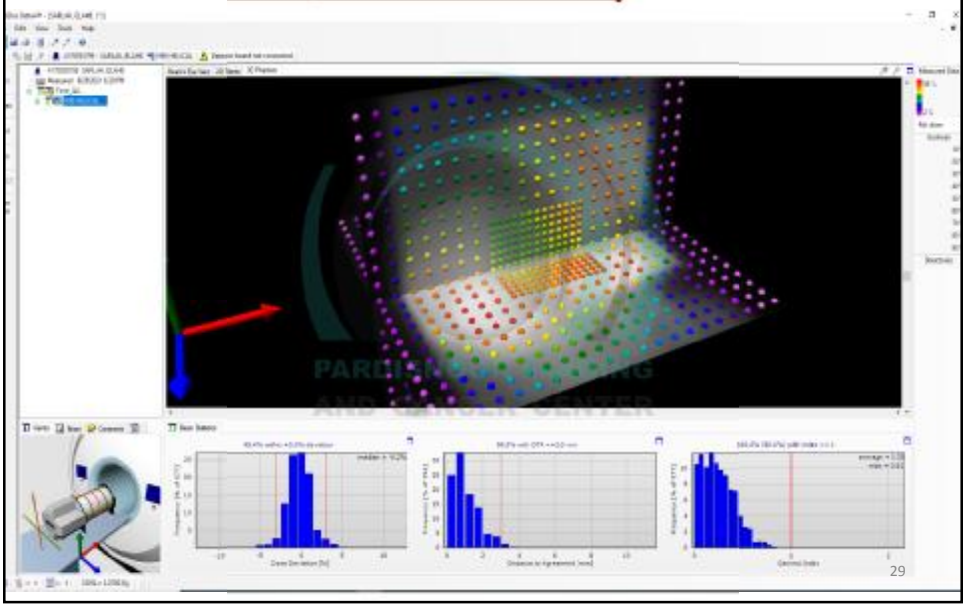
Patient Specific QA



Patient Specific QA in Pardis

We in Pardis Noor niloo cancer center :

Have treated 250 cancer patients with Radixact .

The average gamma pass rate :

98.75% , 3% 3mm

88.47% , 2% 2mm

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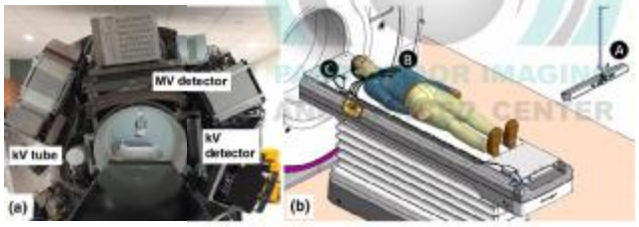
Synchrony

- Real-time tracking technology.
- This technology using image guidance and camera to model the motion of the target and synchronizes the delivery of radiation with this motion using the jaws and multi-leaf collimators (MLCs).



4D Patient QA (HexaMotion)

- Simulates patient breathing motion in PSQA
- 6 degrees of freedom

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Thank You For Your Attention

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