


Breast radiotherapy: TomoDirect vs TomoHelical rationale

Advantages of TomoDirect Treatment

- Decreased dose to contra-lateral structures
- Beam-on dose sparing
- Decreased integral dose
- Decreased planning effort

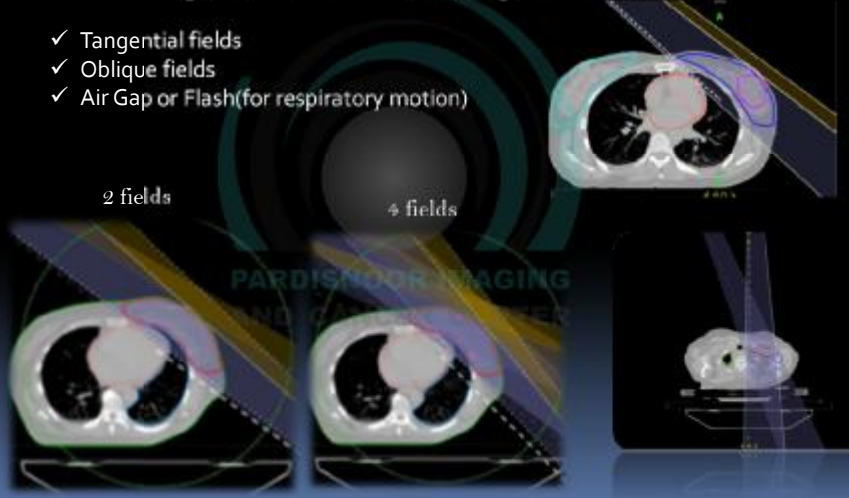


55 Gy
45 Gy
35 Gy
25 Gy
15 Gy
5 Gy

TomoDirect Breast Planning

1. Choosing the best beam angles is critical

- ✓ Tangential fields
- ✓ Oblique fields
- ✓ Air Gap or Flash (for respiratory motion)



TomoDirect Breast Planning

2. Pitch is per projection and not per rotation

Pitch !!!

Hot to Muck

Target not at isocenter

Target at isocenter

0 degrees

Example of a non-optimal pitch

The same "optimal" pitch as before...

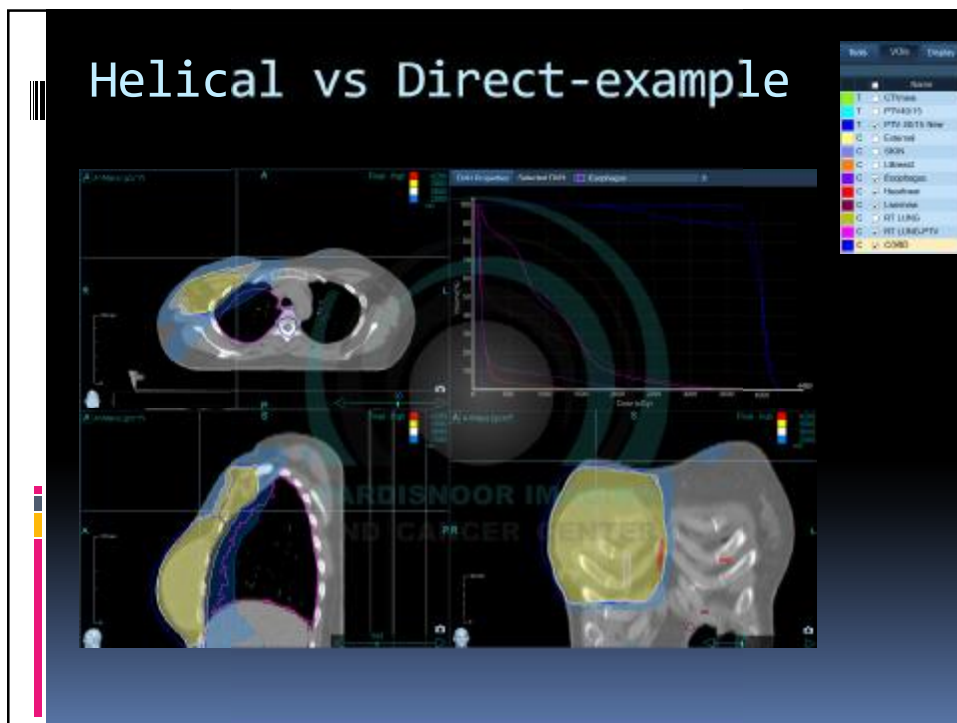
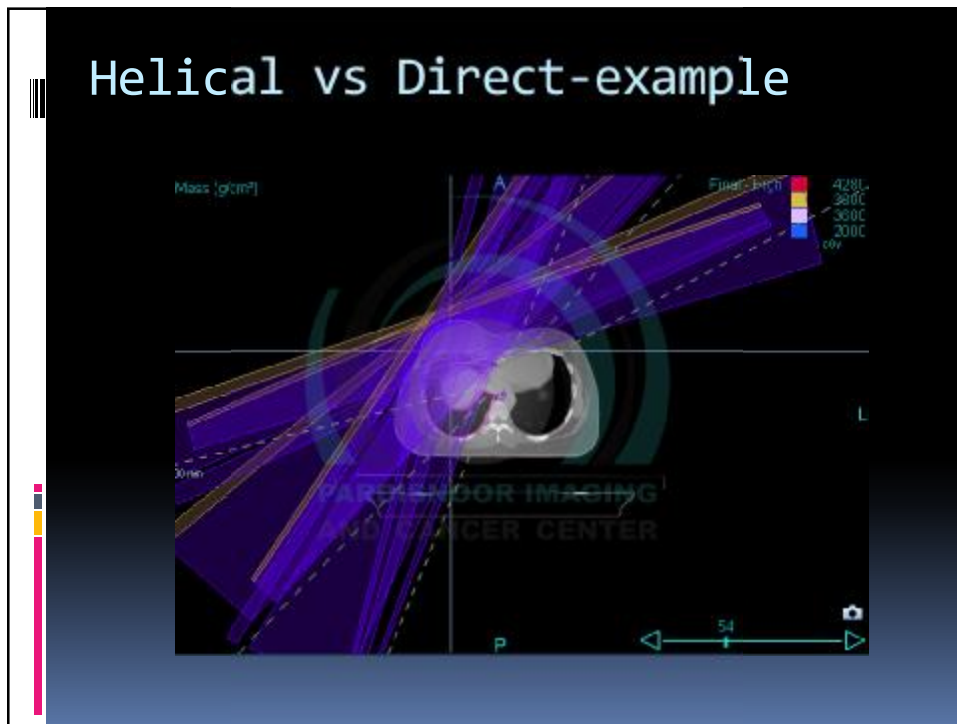
Note how adding a block changes the homogeneity! (tighter pitch should be selected)

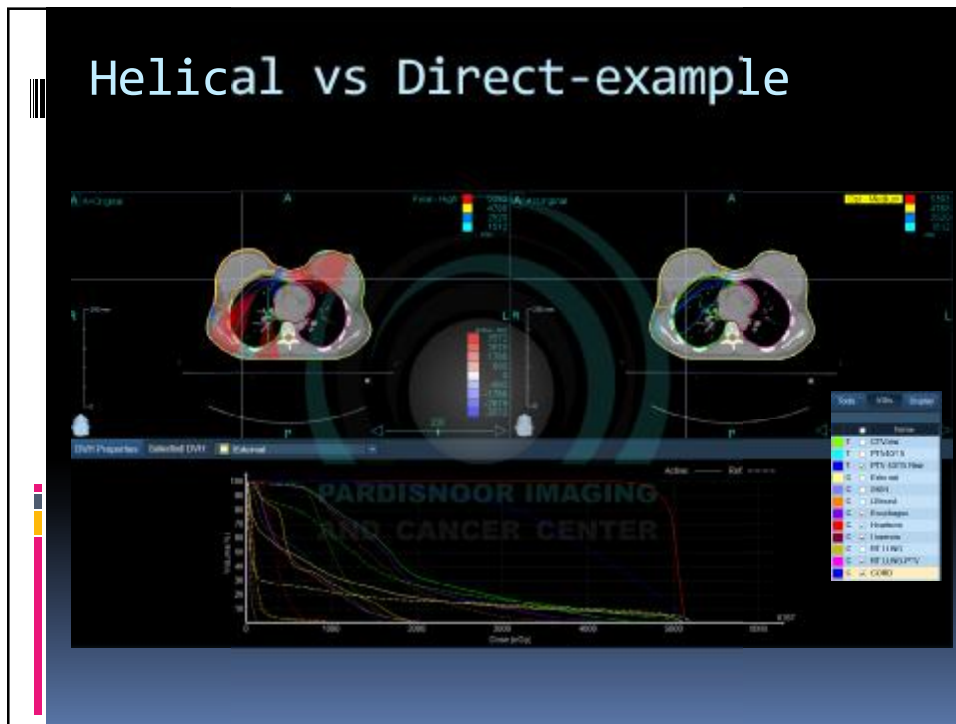
BLOCK

180 degrees

TomoDirect Breast Planning

3. More beams doesn't necessarily mean longer treatment time





Helical vs Direct-example

Name	CRW	Min (cGy)	Max (cGy)	Mean (cGy)	Min (cGy)	Max (cGy)	Mean (cGy)	CI	CI1	CI2	CI3	CI4	CI5	Coverage (%)	Coverage1 (%)
PTV	No	2586	3061	4906	5981	5294	5841	1.04	1.01	3.76	2.21	1.15	1.35	35.80	78.83
PTV1	Yes	1800	2017	4307	4615	5282	6137	1.18	1.07	3.83	1.71	1.15	1.23	28.71	62.51
Esophagus	Yes	13	6	1372	810	8380	3617	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Heart	Yes	369	33	736	31	7900	343	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Heart1	No	188	27	372	131	2592	1826	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Heart2	No	192	29	1304	31	2055	1273	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Lung (Total)	Yes	52	14	126	45	2354	211	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Lung (Total)	Yes	34	43	1405	151	4371	2256	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Spleen/Gad (Thorax)	Yes	88	27	727	170	2388	1818	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
AVOID	No	180	182	1255	2381	5104	5436	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
SPIN	13	1866													
LT.LUNG-PTV	34	1722													
VO	373	2884													
PTV (PTV)	1805	4305						1.1	2.76	1.15				43.35	

Helical IMRT Breast Planning

WHY?

80-90 breast RT patients/yr

30% Whole Breast
20% WB w/ LN

Concerns

- Low Dose
- Skin Dose-respiratory issue
- Complex treatment planning

Clinica Luganese monacco

Case study #1

Tool: VOI, Display

- CTV/LOM
- PTV Heparic
- PTVADITS
- Galena
- BODY-4mm
- Wedge 10
- Blue Form
- Inner couch
- Outer couch
- Long (Left)
- Long (Right)
- SternalCord (Th...
- Heart
- Larynx
- PTV40 5
- PTV+30mm
- PTV+15mm
- PTV-14
- Scapula
- L-LUNG+PTV
- L-LUNG-PTV15
- L-LUNG-PTV30
- L-LUNG-IMRT
- HEART-PTV30mm
- HEART-PTV15
- HEART-PTV30
- HEART-BASE
- Skull-eyes
- Contrastive B...
- Skull-cond. brn

Item	Density Priority	Rears Intersection	Use	Importance	Max Dose (Gy)	Max Dose Penalty	Q/N UM (%)	D/N Dose (Gy)	D/N Penalty
ISO 450Gy	1	Allowed	✓	10	4500	750	1.00	1	1
Heart	10	Never	✓	10	400	100	8.00	120	200
L-LUNG-DAGE	3	Allowed	✓	5	3000	100	90.00	50	500
L-LUNG-PTV30	4	Allowed	✓	5	3500	100	90.00	400	500

