

RT PACS

16Aug2014

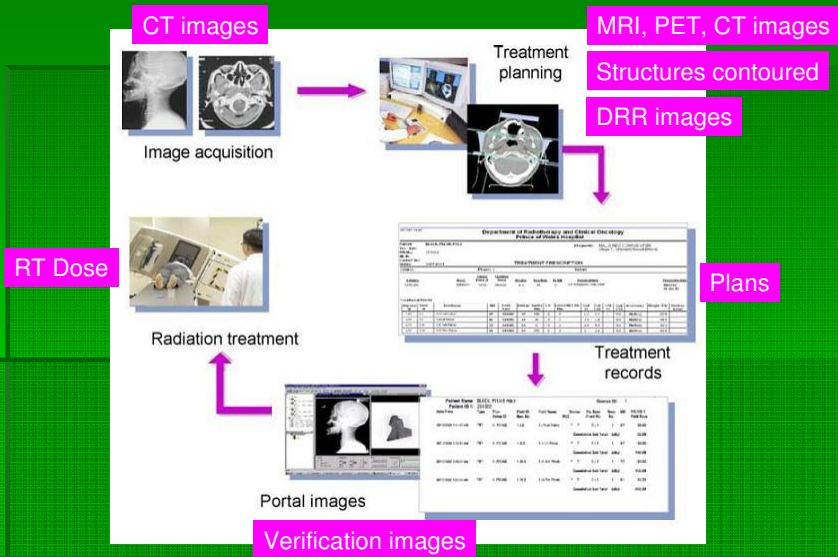
Joseph Lee

Senior Radiation Therapist, HKS&H

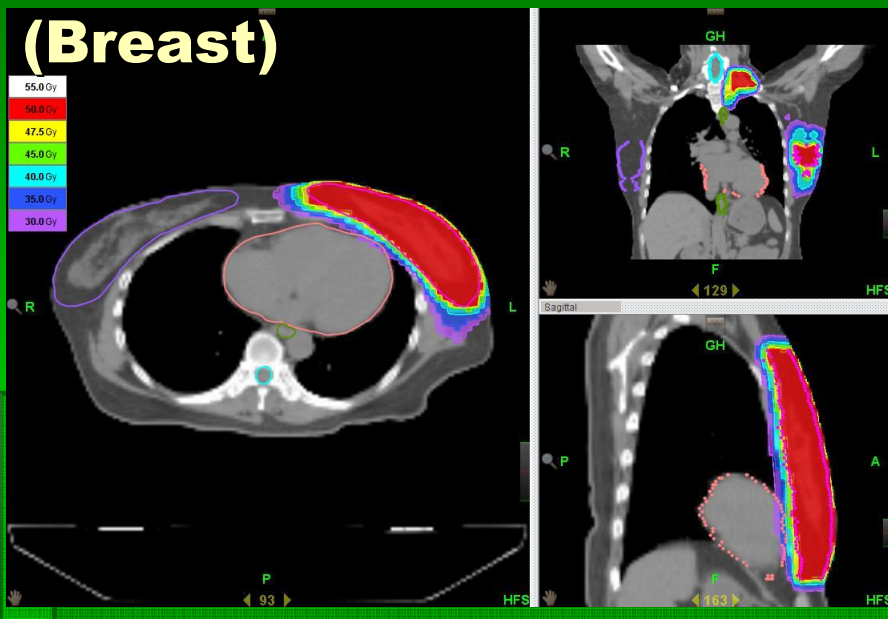
RT PACS

- Radiation Therapy (RT) uses radiation for treatment of malignant disease.
- Delivering commonly 6 Mega Voltage (MV) X-ray beam for treatment purpose.
- Careful treatment **plans**, daily **verification** of treatment positioning and monitoring of **dose** .

RT PACS



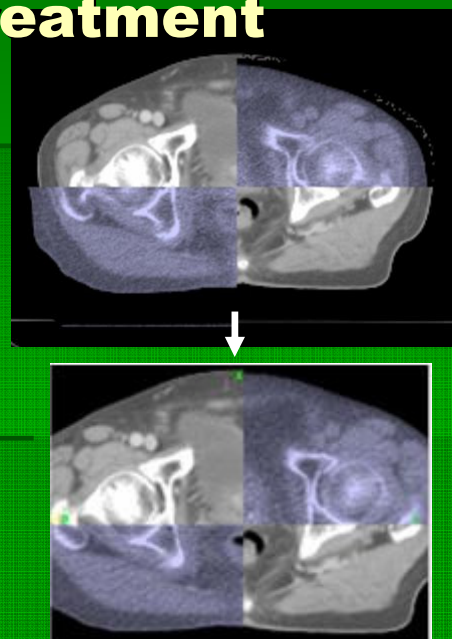
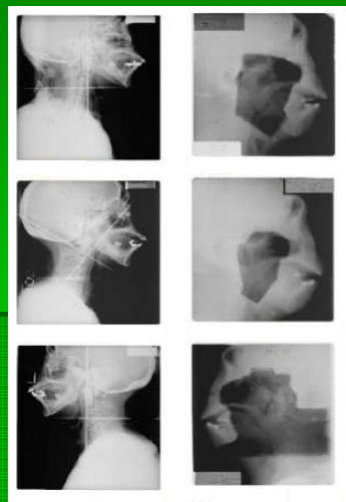
RT PACS – Treatment Plan (Breast)



RT PACS – Treatment Plan (Head and Neck)



RT PACS – Treatment Verification



Object	Description
Spatial registration	Stores the relation between the frames of reference of two image sets (image registration)
RTSTRUCT	Structures contoured on images. Enclosed the target volume or critical organs to be avoided. Contains no pixel (image) data.
RTPLAN	Rx delivery details and geometry. Contains no pixel (image) data.

Object	Description
RTDOSE	Dose delivered by a specified plan.
RTIMAGE	Planar simulator images, digitally reconstructed radiographs (DRR) of portal images acquired during treatment. It contains more geometric information .
RTRECORD	Record of single session or summary of Rx.

RT PACS

Storage

- CT reference data set: 50-75MB each
- CBCT (Elekta): 80MB each
- CBCT (Varian/Siemens): 35MB each
- EPID: 0.3 - 3MB
- OBI: 1.5 – 3MB
- DRR 6MB
- Patient setup photo: 0.1 – 0.8 MB
- Treatment Plan: 0.02-0.5MB
- Total disk space for 3 yrs of growth (1200patients annually): 2 TB

1	See Example Sheet for instructions	Type in the BLUE CELLS	BLUE CELLS	Calculated				
2	Data Source	Estimated # of Patient's View	# Per Patient	Site Image Size (MB)	Total Data Size (MB)	Impac Size Estimate	Notes / Anticipated Frequency	
3	Future Cone Beam Storage	- these images are stored as ELOBS in the MOSAIC SQL database until MOSAIC v2.10 and above. In MOSAIC v2.10 and above these images are moved out of the database to the external data share.						
4	CT Reference Data Set	2400	1	76000	176781	50-75 MB each	1 - 2 per patient	
5	CBCT Elekta					80 MB each		
6	Brain	0	0	80000	0		1 - 3 per week	
7	HeadNeck	0	0	80000	0		3 - 5 per week	
8	Lung	0	0	80000	0		1 - 3 per week	
9	PeMIs	0	0	80000	0		3 - 5 per week	
10	CBCT Varian / Siemens					35 MB each		
11	Brain	113	2	35000	7725		1 - 3 per week	
12	HeadNeck	144	7	35000	34453		3 - 5 per week	
13	Lung	204	7	35000	48809		1 - 3 per week	
14	PeMIs	336	7	35000	80381		3 - 5 per week	
15	Total Future Cone Beam Storage				347158	MB	AVS Files increase CBCT related performance, but approx double storage requirements	
16								
17	Future External Image Storage	- these images are stored outside of the database in the external data share.						
18	EPID	312	2	3000	1828	300 k-3 MB	Avg of 3 per patient per week, excluding the IMRT OBI patients.	
19	OBI	1200	48	3000	168750	1.5 MB - 3 MB	2 per IMRT patient per day, every day	
20	Kodak CR	0	0	1000	0	300k-1 MB	Avg 2.5 per patient per week	
21	Accurion/Orex CR	0	0	3500	0	700k-1.5 MB	Avg 2.5 per patient per week	
22	Fuji CR	0	0	4000	0	4 MB	Avg 2.5 per patient per week	
23	DRR	1200	3	4000	14063	300 k-750 k with some hires up to 4 MB	Avg 3 per patient. Probably 90% of patients.	
24	Acuity DRR	312	2	8000	3856	As big as 8 MB		
25	Digital Radiograph	0	0	800	0	300 k-800k		
26	Vidar scanned image	0	0	1000	0	750 k-1.25 MB		
27								
28	Total Future External Image Storage				189297	MB		
29								
30								
31	Future External Documents Storage	- these scanned images and text documents are stored outside of the database in the external data share.						
32	Patient Setup-ID Photos from digital camera	2400	2	500	2344	100-500 k depending on camera resolution	Elekta recommends lowest mega pixel resolution to reduce image size as much as appropriate.	
33	Treatment Plans exported as PDF files	2400	1	500	1623	20 - 500 k	Exported from ADAC, CMS, or Elekta as PDF files and imported into aDCAM.	
34	eSCAN - Text documents	2400	10	100	2344	100K	IMPAC recommends ds: black/white, Group 5M compressed TIF, 200 DPI. Higher resolution or color/gray-scale will greatly increase file size.	
35	eSCAN - Graphics	2400	10	300	7031	300k		
36	eSCAN - PDF	2400	10	100	2344	Variable 100kb - 4MB	Standard MS-Word Document	
37	eSCRIBE	2400	1	80	244	80-100k		
38	Structured Noting (PhasNote)	2400	5	30	352	30-80k	Rich-Text Document	
39	Total Future External Document Storage				16181	MB		
40								

	A	B	C	D	E	F	G
41	Current MOSAIQ Data (enter value in GB)		0		0	MB	Current amount of data in the MOSAIQ_DATA directory
42	Current CBCT in SQL DB (enter value in MB)		138240000		135000	MB	Amount of CBCT data currently in the MOSAIQ SQL DB and being migrated to MOSAIQ_DATA. This value is in MB and can be obtained by executing the following SQL query against the MOSAIQ_DB. The value in MB represents the RESERVED column SP_SPACUSED
43							
44	Total Of Current MOSAIQ Data + Current CBCT				135000	MB	
45							
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
61							
62							
63	MOSAIQ				1,996,442	MB	Total disk space requirement for 3 years worth of growth in MB.
64					1,949.65	GB	Total disk space requirement for 3 years worth of growth in GB.
65					1.9	TB	Total disk space requirement for 3 years worth of growth in TB.
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							
81							
82							
83							
84							
85							
86							
87							

Manufacturer
 Delta Business Area Software Systems
 IMAC Medical Systems, Inc.
 100 Mathilda Place
 8th Floor
 Sunnyvale, CA 94098
 USA

Bibliography

- Shakeshaft J, PACS in Radiotherapy. RAD Magazine, 433, 13-14.
- Law MYY, A model of DICOM-based electronic patient record in radiation therapy. Computerized Medical Imaging and Graphics 29(2005) 125-136.

THANK YOU!