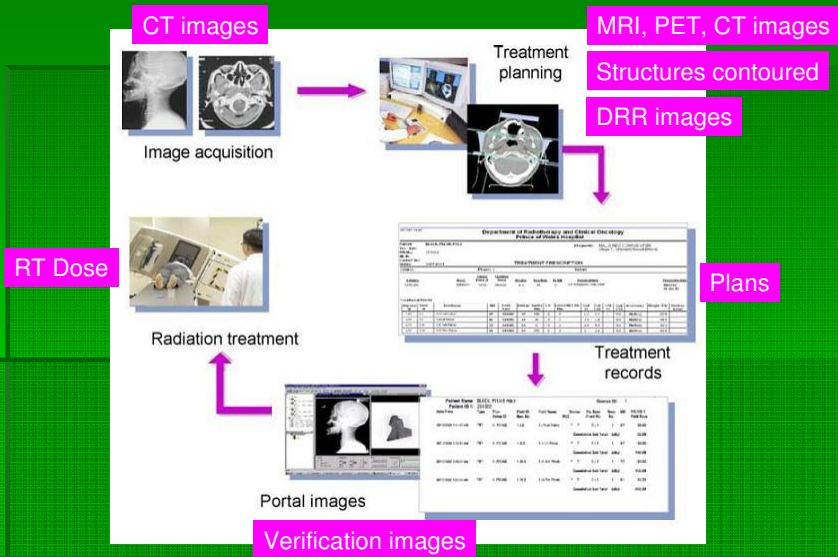# RT PACS

16Aug2014

Joseph Lee
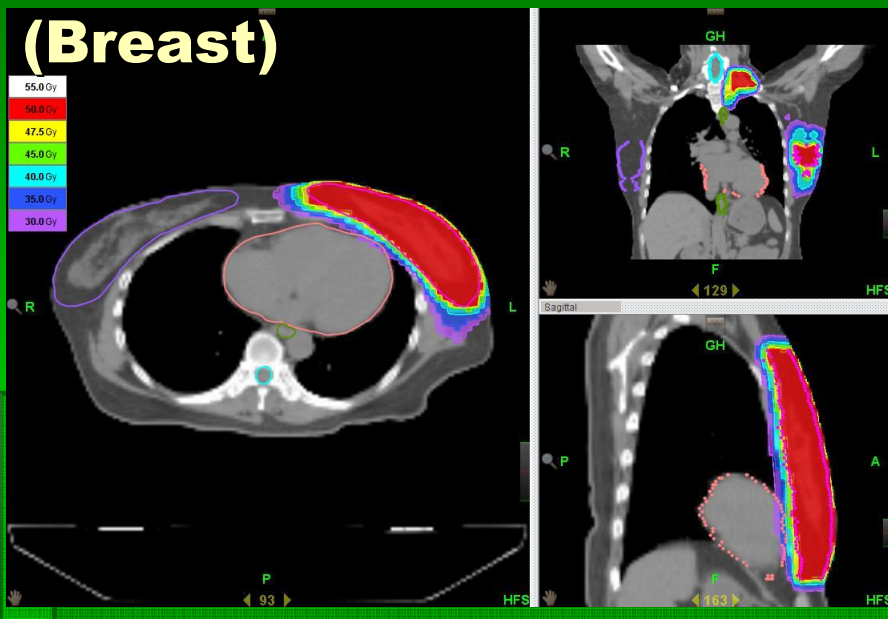
Senior Radiation Therapist, HKS&H

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

CT images
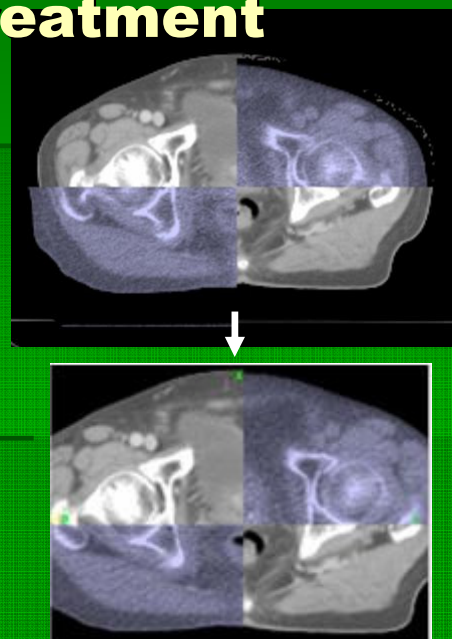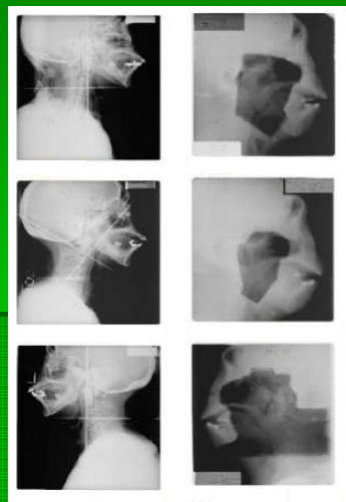
MRI, PET, CT images

Structures contoured

DRR images

Treatment planning

Image acquisition

RT Dose

Radiation treatment

Plans

Treatment records

Portal images

Verification images

RT PACS – Treatment Plan (Breast)

55.0 Gy	
50.0 Gy	
47.5 Gy	
45.0 Gy	
40.0 Gy	
35.0 Gy	
30.0 Gy	

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

CT images — Image acquisition — Treatment planning

Spatial registration
RTSTRUCT
RTIMAGE

RTDOSE
RTPLAN

Radiation treatment — Treatment records

Portal images
RTIMAGE

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		1 Aug 02	2 Aug 02	3 Aug 02	4 Aug 02	5 Aug 02	6 Aug 02	7 Aug 02	8 Aug 02	9 Aug 02	10 Aug 02	11 Aug 02	12 Aug 02	13 Aug 02	14 Aug 02	15 Aug 02	16 Aug 02	17 Aug 02
Patient name	Chan Mei Mei																	
Patient ID	A123456																	
Sex	Female																	
Age	45																	
Telephone	987654																	
Address	10 Peter street, Hong Kong																	
Course	1																	
Region	Breast Axilla																	
DICOM image																		
CT/CT sim		x																
MR																		
RT Image																		
Simulation image			x															
DRR																		
Portal image									x									
Treatment plan (RT Structure Set, RT Plan, RT Dose)						x												
RT Beams Record						x												
No. of treatment								1	2	3			4	5	6	7	8	
Brachy Record																		
Treatment Status										Continue RT							Continue RT	
Treatment comment																		
Treatment Summary Record		x	x		x			x	x	x			x	x	x	x	x	

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

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!