

Audit on the use of IGRT by an independent UK provider

Karol Sikora¹, John Pettingell², Sarah Hynd²

¹CancerPartnersUK, 21 Barrett St, London W1U 1BD

²CPUK Elstree, London

Purpose

CancerPartnersUK is rapidly establishing a network of independent cancer centres around Britain. Our first unit opened in August 2009 and we have since treated over 500 radiotherapy patients at our first four centres, with more sites on the way.

Aims

- provide patients in the UK access to world-class radiotherapy treatment and integrated cancer care
- revolutionise the working lives of our consultants by allowing them to work remotely
- prove that single LINAC facilities could work well in the UK
- show that we could dramatically reduce the time taken to build and commission radiotherapy facilities
- deliver IMRT for every radical plan
- use IGRT with every fraction and assess its impact:
 - ensuring precision in delivery
 - reducing side effects
 - giving clinicians confidence in prescribing higher and potentially more efficacious doses

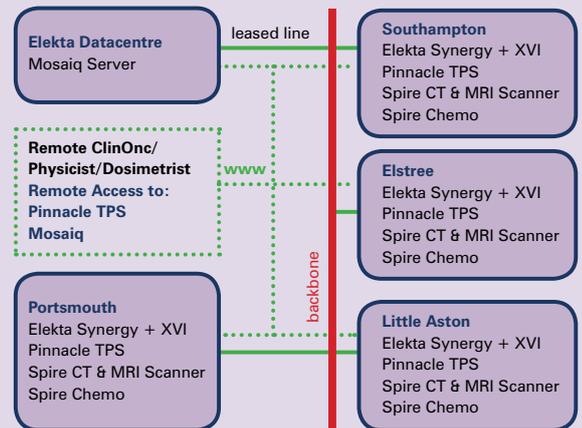
Implementation

- four radiotherapy centres, opening:
 - Aug 2009 – Portsmouth**
 - Feb 2010 – Southampton**
 - July 2010 – Elstree**
 - Mar 2011 – Birmingham**
- 9 months from first day of construction to first treatment
- all sites have one LINAC
- all sites deliver latest techniques
 - IMRT, IGRT, breath-hold, MR fusion etc.
- all sites networked to central servers
 - patients can be treated at any centre
 - centres can be opened quickly
 - introducing IMRT and IGRT immediately
 - local & centralised planning services

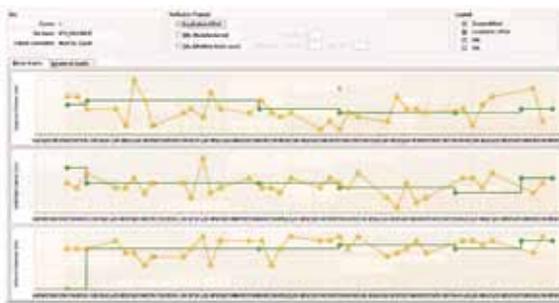
IMRT & IGRT

- 64%** of our patients are treated with IMRT, compared to UK average of 10%
- 95%** of our patients are treated with IGRT + daily online correction

Current network of CPUK centres



IGRT in action: correcting for setup



session offsets (yellow) = daily isocentre corrections / couch shifts
localisation offsets (green) = systematic isocentre corrections

IGRT in action: correcting for internal anatomy changes



gas in the rectum cannot be corrected by a couch shift, so... patient off the bed > walk around > visit bathroom > back to Linac > re-scan... set-up is approved and ready to treat

Bottom line on IGRT

- Our early data, at one year, assesses the utility of IGRT in different clinical situations based on:
 - frequency of radiographer intervention on daily treatment with daily online correction in couch position / patient setup
 - frequency of changes to the planned isocentre setup
- A couch shift was made at the delivery of 91% of fractions and an iso-centre shift made in 15% of treatments during a course. There were major differences between tumour types

IGRT audit in first 223 patients

	Breast	Prostate	Lung	Brain	Bladder	Other	Total
Patients	102	29	11	9	4	68	223
% IGRT used	92	100	82	100	100	81	93
% fractions requiring couch shifts	76	97	96	93	93	94	91
% treatments requiring iso shifts	20	10	17	22	12	12	15

Conclusion

- IGRT made a significant difference to the Target Volume actually treated in over 90% of patients
- Web-enabled distance computer planning has led to more efficient ways of working including:
 - centralised planning service
 - consultant approval for plans from remote locations, ensuring shorter patient pathways with minimal disturbance to consultants work patterns
- A rapid expansion of our network is now envisaged and, along with more independent centres, could include joint ventures with NHS providers and the formation of an international group to improve the global quality of radiotherapy.