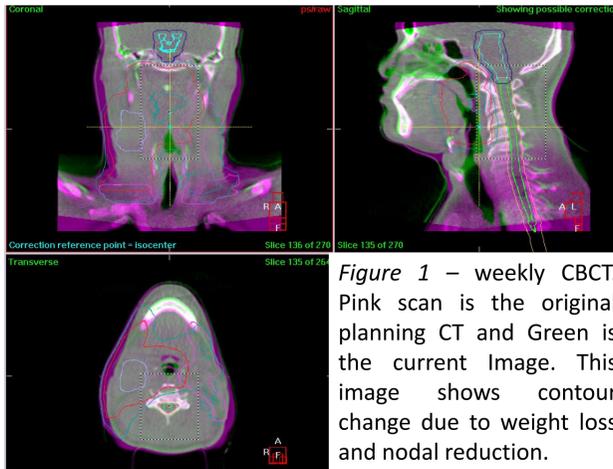


Repeat CT Planning Scans During Head and Neck Radiotherapy

J Osborn, N Begum, Dr O Donnelly, L Eley and S Chapman
Radiotherapy Department, University Hospital Southampton

Aims

To collect data on the proportion of repeat CT scans undertaken for HN patients undergoing radical radiotherapy. To evaluate the factors resulting in the repeat scan, and together with a review of the current literature in this field, provide recommendations to inform a local adaptive radiotherapy strategy for HN cancer patients.



Method

A retrospective audit was undertaken for all HN patients treated with 6 weeks of radiotherapy between 2015 - 2016. Data was collected on any HN patient requiring a rescan during treatment. Tumour site, time point of rescan and outcome following rescan were all collected for analysis.

Background

During radiotherapy (RT) for Head and Neck (HN) cancer patients, it is common for changes to occur in patient positioning and external body contour. The reasons include decrease in tumour or nodal volumes and weight loss¹ (see figure 1 – CBCT of contour change). These changes impact on set-up accuracy and risk potential geographical miss due to the highly conformal dose distributions of IMRT.² Often patients require repeat CT scans and re-plans to assess and adjust for these changes which introduces unpredictable workload for pre-treatment and medical physics teams. The national adaptive radiotherapy strategy acknowledges the challenges of the HN cohort and recommends developing a local protocol according to equipment characteristics³. This poster displays the initial work undertaken towards the development of a local protocol.

Results

45% of patients undergoing chemoRT required a rescan compared to 17% who received RT alone.

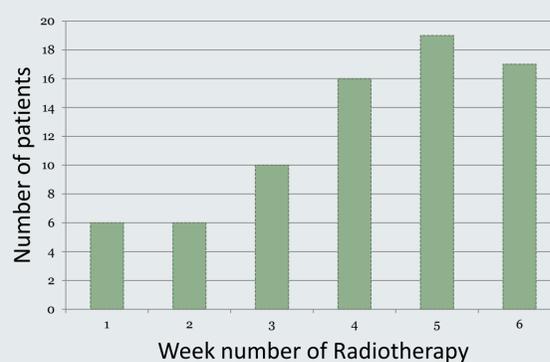
The table shows sites treated. 45% of oropharynx patients required a rescan, accounting for 45 of the 74 rescanned in a 2 year period.

| Site | Total Population treated | No. requiring 2nd CT Scan |
|--------------------------------|--------------------------|---------------------------|
| Oropharynx | 99 | 45 |
| Oral Cavity | 30 | 6 |
| Larynx | 21 | 4 |
| Hypopharynx | 18 | 6 |
| Parotid & salivary glands | 13 | 5 |
| Nasal cavity & paranasal sinus | 11 | 2 |
| Unknown primary | 7 | 4 |
| Nasopharynx | 3 | 2 |
| Total | 202 | 74 (36.8%) |

The two main reasons for rescan requests were weight loss (57%) and set-up error (22%) observed on the weekly CBCT imaging.

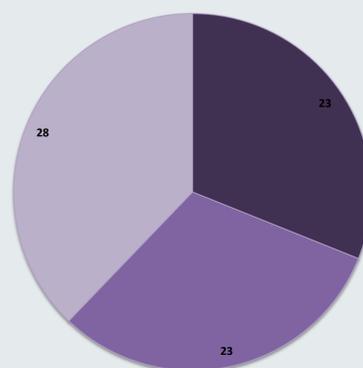
All re-scans underwent a dose check with the original treatment plan however only 38% required a re-plan.

Time point of 2nd CT scan



Outcome of Rescan

■ Iso Shift ■ No action ■ Replan



Recommendations

Literature supports our finding that those requiring a 2nd CT scan are patients with oropharynx cancer and locally advanced disease undergoing chemoRT. This subgroup of patients could benefit from a pre-scheduled 2nd CT scan⁴⁻⁶.

The average time point in literature for a 2nd CT scan was between 3-4 weeks during RT; a week earlier than our findings. This could be due to our reactive response to contour change; therefore we need to explore optimum time point of the pre-scheduled CT scan⁴⁻⁶.

Not all patients required a re-plan which is similar to current literature. Therefore we recommend continued data collection with change in practice implemented to establish impact on pre-treatment and medical physics⁶.

References:
[1] Gastadot P, Lee JA, Geets X, Gregoire P. Adaptive Radiotherapy of Head and Neck Cancer. *Seminars in Radiation Oncology* 2010;20:84-93
[2] Barrett A, Dobbs J, Morris S, Roques T. Practical radiotherapy planning. 4th ed. London: Hodder Arnold; 2009.
[3] National Cancer Action Team. National radiotherapy implementation group report: image guided radiotherapy (IGRT) guidance for implementation and use. Available on: https://www.nca.gov.uk/sites/default/files/document_versions/National%20Radiotherapy%20Implementation%20Group%20Report%20IGRT%20Final.pdf; 2012.
[4] Brown E, Owen R, Harden F, Mengersen K, Oestreich K, Houghton W, et al. Predicting the need for adaptive radiotherapy in head and neck cancer. *Radiation Therapy and Oncology* 2015;116:57-63.
[5] Bhide SA, Davies M, Burke K, McNair HA, Hasen V, Barbachano Y, El-Hariry IA, Newbold K, Harrington KJ, Nutting CM. Weekly volume and dosimetric changes during chemoradiotherapy with intensity-modulated radiation therapy for head and neck cancer: a prospective observational study. *Int. J. Radiation Oncology Biol. Phys* 2010;76:1360-1368.
[6] Ahn PH, Chen CC, Ahn AI, Hong L, Sripes PG, et al. Adaptive planning in intensity-modulated radiation therapy for head and neck cancer: single-institution experience and clinical implications. *Int. J. Radiation Oncology Biol. Phys* 2011;80:677-685.



University Hospital
Southampton
NHS Foundation Trust

Contact Info:

I am keen to hear from others and share ideas for best practice. Please do get in touch with any comments or questions or if you would like a PDF copy of this poster:

Joanne Osborn, Head and Neck Advanced Practitioner
Tel.: 023 8120 5442 Email: joanne.osborn@uhs.nhs.uk