

OC-0563

Investigating stress, burnout and job satisfaction within New Zealand radiation therapy departments

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Purpose/Objective: International research indicates that oncology care workers are exposed to a variety of unique occupational stressors that put them at significant risk of burnout. This has severe implications for job satisfaction, the retention of staff and arguably the quality of care cancer patients receive whilst on treatment. The current study aimed to obtain a national indication of stress associated with occupational stressors, burnout and job satisfaction within New Zealand (NZ) Radiation Therapy departments. Potential indicators of burnout and job satisfaction were explored, as well as job satisfaction initiatives.

Materials and Methods: All staff currently practicing in the eight Radiation Therapy departments in NZ were invited to participate anonymously in a questionnaire hosted on SurveyMonkey via email. The questionnaire contained questions addressing participant characteristics, such as age, work experience and position. The Maslach Burnout Inventory (MBI) was incorporated in order to make direct comparisons with previously published studies, and scales measuring the intensity of stress associated with specific occupational stressors, stress reduction strategies and job satisfaction were included. Incomplete responses were excluded and a total of 171 (out of 349) complete responses were analysed with SPSS 19.

Results: Of the 171 responses, 23 identified as oncologists (Os), 111 identified as radiation therapists (RTs), 22 identified as radiation nurses (RNs) and 15 identified as radiation physicists (RPs).

All participants, regardless of profession, reported high stress levels associated with both patient-centred and organisational stressors. Participants scored high in all three domains of burnout: emotional exhaustion, depersonalisation and personal accomplishment. Interestingly, although organisational stressors and emotional exhaustion predicted lower job satisfaction, patient stressors were associated with higher job satisfaction. Job satisfaction initiatives such as on-going education, mentoring and role extension were supported by many participants as was addressing organisational stressors, such as lack of recognition and support from management and unrealistic expectations and demands.

Conclusions: Staff in NZ exhibit higher levels of burnout than MBI medical norms and international studies conducted in Europe, North America and Australia. In contrast to previous studies, indications of personal accomplishment and job satisfaction were incredibly high. In NZ staff in Radiation Therapy departments may be more at risk of compromising their wellbeing, compelled by the sense of personal accomplishment and satisfaction they derive from their chosen profession.

POSTER DISCUSSION: YOUNG SCIENTISTS 6: DOSIMETRY, DOSE CALCULATIONS AND QA

PD-0564

National dose audit of the quality of head and neck IMRT in the Danish Head and Neck Cancer Group (DAHANCA)

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Purpose/Objective: Head and neck (HN) radiotherapy within the Danish Head and Neck Cancer Group (DAHANCA) has changed in the last decade from 3D conformal radiotherapy to exclusively intensity modulated radiation therapy (IMRT). The steep 3D dose gradients in

IMRT call for a high geometric and dosimetric accuracy in the entire chain from treatment planning to treatment delivery. The purpose of the DAHANCA RT-QA group is to monitor the quality of the IMRT delivery at all six radiotherapy departments participating in DAHANCA protocols. The geometric and dosimetric accuracy of the IMRT delivery was verified by means of an external, independent dose audit.

Materials and Methods: The M. D. Anderson Phantom Lab (MDAPL) of the M. D. Anderson Cancer Center provided each DAHANCA center with an anthropomorphic HN phantom equipped with Thermoluminescence Dosimeters (TLD) and radiochromic films [A. Molineu, IJROBP 2005]. At each center, the phantom went through the standard clinical treatment chain similar to an actual patient, i.e. CT scan, treatment planning, and treatment delivery including cone beam-CT or kV image setup. Three centers used sliding window IMRT technique, two centers used segmental step and shoot IMRT technique and one center used volumetric modulated arc therapy technique (VMAT). According to MDAPL, the treatment planning should follow RTOG protocols where at least 95 % of the target must receive the prescribed dose. The DAHANCA guidelines, which adheres to ICRU, states that at least 95 % of the prescribed dose should be delivered to the entire target. This difference made the dose planning non standard for the centers. The films were analysed by gamma evaluation and the TLD measured doses were compared to the doses reported by the planning systems.

Results: All centers met the MDAPL pass criteria of 85 % with gamma criteria of 7 % and 4 mm. The average pass rate for axial and sagittal films were 99.6 % (range 99-100 %) and 99.2 % (97-100 %), respectively. Using a more strict gamma criteria of 3 % and 3 mm, the average pass rates for the axial and sagittal films were 93 % (86-99 %) and 89 % (83-96 %), respectively. The average ratio of the measured RCP TLD doses to reported doses was 0.99 ± 0.016 (1SD) across the centers. The average displacement of the steepest dose gradient between primary PTV and organ at risk was 0.7 mm (0-2 mm).

Conclusions: All 6 centers in DAHANCA passed the external dose audit. The analyses showed a high correlation between treatment plan and treatment delivery, indicating high and consistent quality of the IMRT delivered in the DAHANCA centers.

PD-0565

Evaluation of the QA process for a UK HNC IMRT trial and a comparison of its IMRT techniques.

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Purpose/Objective: To assess efficacy of planning QA for the ART DECO trial (CRUK/10/018) and identify any significant differences between static (sIMRT) and rotational (rIMRT) forms of IMRT in the trial.

Materials and Methods: A randomised multicentre accelerated radiotherapy study of dose escalated IMRT vs. standard dose IMRT in patients receiving treatment for locally advanced laryngeal/hypopharyngeal cancers (ART DECO) is currently recruiting. The experimental arm of 67.2Gy/28 fractions to the radical target (PTV1) and 56Gy/28 fractions to the elective target (PTV2) is being tested against a UK standard of 65Gy/30fractions to PTV1 and 54Gy/30fractions to PTV2.

As part of the UK RTTQA IMRT credentialing program, the QA team reviews a hypopharynx test case planned by the centre at the experimental dose level for each planning system and delivery technique used. Non-compliant or sub-optimal plans require resubmission. Evaluations have been carried out on PTVs edited back from the skin surface. Local CTV-PTV and OAR-PRV margins were used.

Results: To date, there have been 32 protocol compliant hypopharynx submissions from 27 centres; 14 using rIMRT and 18 sIMRT.

Table 1 shows differences between the initial and approved plans for each centre. PTV1 coverage improved based on all DVH criteria investigated. PTV1 D_{5%} improved, whilst no change was seen in D_{2%}. PTV2 showed a statistically significant improvement at D_{95%} and no degradations.

There was an overall increase in dose to the brainstem (BS) and spinal cord (SC) PRVs at the D_{1cm3} level, all approved plans were within the tolerance of 55Gy and 48Gy respectively. No statistically significant changes were seen in all other constraints. 74% of plans met the 24Gy contralateral mean dose constraint in their final submission.

In terms of target coverage, sIMRT and rIMRT plans were comparable. There were statistically significant differences at the PTV1 D_{50%}, D_{5%} and D_{2%}, with rIMRT techniques being lower on average by 0.2Gy (p=0.014), 0.8Gy (p<0.001) and 0.6Gy (p=0.009) respectively. BS D_{max} and BS PRV D_{1cm3} were the only OAR or PRV constraints showing statistically significant differences, being on average 5.0Gy (p=0.046) and 5.1Gy (p=0.026) lower in the rIMRT plans.