Conclusions: Dosimetric impact of swallowing is insignificant as this motion is rare, rapid and easily suppressed by patients. There is however a risk of systematic miss-targeting if the planning CT is not acquired with the larynx in rest position. Anatomic changes during treatment are associated with a laryngeal shift in a significant proportion of patients, which can justify the use of daily soft-tissue imaging in laryngeal IGRT. An 8 mm ITV margin accounting for non-swallowing laryngeal motion in PL-IMRT would allow for a safe and significant dose reduction to organs at risk.

4 PATTERNs OF CARE AMONG CANADIAN RADIATION ONCOLOGISTS AND UROLOGISTS RELATED TO POST-OPERATIVE RADIOTHERAPY FOR PATIENTS WITH PROSTATE CANcer

Bonnie Bristow1, Mohammed Aldehaim2, Katija Bonin3, Chee Ka Candice Lam1, Xingshan Cao2, Ewa Szumacher1
1Odette Cancer Centre, Toronto, ON
2Sunnybrook Health Sciences Centre, Toronto, ON
3University of Toronto, Toronto, ON

Purpose: The American Society for Radiation Oncology (ASTRO) and American Urological Association (AUa) developed post-prostatectomy radiotherapy (RT) guidelines to aid patient counselling regarding adjuvant (ART) and salvage radiotherapy (SRT). The objective of this study was to examine awareness and compliance of these guidelines among Canadian radiation oncologists (RO) and urologists (U).

Methods and Materials: An online 28-item survey was developed, pretested and distributed by Canadian Association of Radiation Oncology (CARO) and Canadian Urology Association (CUA) to RO and U that treat prostate cancer. Similarities and differences between RO and U were examined using Wilcoxon rank sum test and Chi-square test. Only p-values for significant findings reported.

Results: Fifty-two out of 87 RO and 76/570 U responded to the survey. Ninety percent of RO and 40% U practiced in academic centres. Eighty-two percent of RO and 49% U would always refer patients with seminal vesicle invasion (77% RO, 68% U), extraprostatic extension (72% RO, 35% U; p < 0.001), and positive margin (84% RO, 57% U; p = 0.004). Seventy-six percent RO and 51% U recommended ART > 50% of the time for adverse pathological findings post RP (p = 0.011). Seventy-one percent RO and 49% U agreed that ART provided long-term biochemical control benefit but not overall survival benefit. Sixty-eight percent RO and 56% U suggest RT two to six months post-surgery. Percentage of respondents who always informed patients about possible adverse pathological findings post radical prostatectomy (RP). Sixty-one percent RO and 48% U inform patients about uncertainty of using ART on development of metastatic disease and overall survival (p = 0.025). ART was considered for seminal vesicle invasion (77% RO, 68% U), extraprostatic extension (72% RO, 35% U; p < 0.001), and positive margin (84% RO, 57% U; p = 0.004). Seventy-six percent RO and 51% U recommended ART > 50% of the time for adverse pathological findings post RP (p = 0.011). Seventy-one percent RO and 49% U agreed that ART provided long-term biochemical control benefit but not overall survival benefit. Sixty-eight percent RO and 56% U suggest RT two to six months post-surgery. Percentage of respondents who always informed patients about detectable or rising PSA post-RP were associated with metastatic disease (36% RO, 46% U) or death from disease (21% RO, 19% U). Seventy-seven percent of RO and 93% of U always monitored post-RP PSA to enable early SRT (p = 0.016). Seventy-three percent RO and 84% U agreed that biochemical recurrence should be defined as detectable or rising PSA ≥ 0.2 ng/ml with second confirmatory level ≥ 0.2 ng/ml after RP (p > 0.199). Fifty-nine percent of RO and 43% U would always refer patients with biochemical recurrence without evidence of distant metastases for SRT, but 24% of RO and 3% of U would not. Ninety percent of RO and 70% U would inform patients that the effectiveness of RT for PSA recurrence is greatest when given at lower PSA values (p = 0.011).

Conclusions: Considerably less U had read the guidelines compared to RO. There was concurrence about the level of awareness for some parts of the guidelines; however, other areas had low compliance.

5 DOES PEER REVIEW OF RADIATION TREATMENT PLANS IMPACT CLINICAL CARE? A SYSTEMATIC REVIEW OF THE LITERATURE

Kelsey Brunskill1, Gabriel Boldt2, Timothy K. Nguyen3, Alexander V. Louie4, David A. Palma
1University of Western Ontario, London, ON

Purpose: Peer review of radiation plans is recommended as an approach to improving patient safety and quality of care. However, peer review rounds are resource-intensive, and their impact on clinical care is not well-quantified. The objective of this study was to undertake a systematic review of the literature to assess the impact of peer review on clinical care.

Methods and Materials: A systematic review of the literature was conducted according to PRISMA guidelines, including MEDLINE, EMBASE, and abstracts from relevant radiation oncology meetings. For inclusion, studies were required to report the impact of physician peer review on at least one element of treatment planning (e.g. target volume/organ at risk delineation, dose prescription, or dosimetry). Surveys in which radiation oncologists were asked to estimate the impact of peer review on treatment planning were also included to ascertain physician perspective on the clinical impact of peer review.

Studies reporting central review of contours in clinical trials were excluded. All proportions reported represent weighted averages across studies.

Results: The initial search yielded 882 potentially eligible studies. Full-text review was performed independently by two researchers, with discrepancies settled by a third. In total, 16 studies met inclusion criteria and were included in the final analysis. Twelve studies, involving 12,239 patients, reported patient outcomes whereas, four surveys reported oncologists’ estimates of clinical impact. Studies were recent, with the majority (75%) published since 2010. Twelve studies reported on multiple tumour sites, whereas single-site studies included head and neck (n = 1), lung (n = 2), and breast (n = 1). In most studies, peer review occurred before the start of radiotherapy or within the first few fractions. Overall, peer review resulted in modifications to 10.7% of patient plans. Five studies differentiated between minor versus major changes and reported averages of 7.5% minor changes and 2.5% major changes. From the survey studies, oncologists estimate that modifications occurred in 6% of treatment plans.

Conclusions: Based on a systematic review of the literature, physicians review results in changes in clinical care and the potential impact of peer review. However, further research is required to determine the essential elements of peer review, and to assess the impact of peer review on clinical outcomes.

6 EPID-BASED IN VIVO DOSIMETRY SYSTEM FOR SBRT-VMAT: MEASURED VERSUS PLANNED DOSE

Peter M McCowan1, Timothy van Beek2, Eric vanUytven3, Jim Butler4, Shaun K Loewen1, Maged Nashed5, Harvey Quon1, Boyd McCurdy1
1University of Manitoba, Winnipeg, MB
2CancerCare Manitoba, Winnipeg, MB

Purpose: Physics-based assessment tools were developed to utilize transmission EPID data acquired during treatment to reconstruct in vivo 3D dose for every fraction of patients treated with stereotactic body radiation therapy (SBRT). This method provides verification of inter-fractional dose delivery to capture treatment delivery errors midway through treatment, allowing potential corrective interventions to reduce the radiobiological impact on patients given the high dose per fraction delivered in SBRT. In this study, the two-year results of our implemented EPID-based dose verification system are presented.

Methods and Materials: Based on our initial experiences, several enhancements were implemented to improve comparison between the EPID and treatment planning system 3D doses including, patient-specific EPID frame averaging optimization,