Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

The analyses were refitted after inverse probability treatment weighting (IPTW) was performed for age, year of EBRT, Gleason score, cT-stage and time from biopsy to EBRT.

Results: Of 932 eligible patients, 635 (68%) and 297 (32%) had intermediate- and high-risk prostate cancer, respectively. Overall, 53% of patients were trial participants. BCR rates were 11 versus 5% (p=0.27) and 12 versus 14% (p=0.08) in trial participants versus non-participants for intermediate- and high-risk subgroups, respectively. Trial participation was not a predictor of BCR in multivariable Cox regression models in both intermediate- (hazard ratio [HR]: 1.34; 95% confidence interval [CI]: 0.72-2.49; p=0.36) and high-risk patients (HR: 1.03; 95% CI: 0.45-2.34; p=0.90). These results were unchanged in the IPTW cohorts.

Conclusions: Relying on a large prospectively maintained database, clinical trial participation does not affect biochemical recurrence in EBRT-treated intermediate- and high-risk prostate cancer patients after accounting for potential confounders.

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CLINICAL INNOVATION: INTEGRATION OF PATIENT PARTNERS WITHIN THE MULTIDISCIPLINARY ONCOLOGY TEAM

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Purpose: Inclusion of Patient Partners (PP) who have experienced an oncologic care trajectory to the oncology multidisciplinary healthcare team engages patients into their own care trajectory, improves patient care experience while improving the quality of care and thus, contributing to a more patient centered approach. The PPs, are selected and trained to support the patients as well as to contribute as an integral part of the oncology healthcare team. This project aimed for oncology patients to have an PP included into their healthcare team.

Materials and Methods: This is a mixed longitudinal observational and descriptive study carried out among patients, PPs and health professionals (radiation oncologists, oncologist, surgeons, nurses). Validated questionnaires measuring distress (K6) and ability to cope with cancer (CASE) were administered to the patients. Descriptive analysis and Chi2 analysis were performed. Qualitative analysis from interviews with PPs and professionals were carried out.

Results: Since December 2019, 501 patients were supported by 24 PPs following the referral of 20 professionals in 2 healthcare centres. Questionnaires highlighted that the PP intervention reduced patients anxiety by sharing their experiences (92,3%), helped them prepare for medical appointments (84,6%), were more proactive in decision-making (53,8%) and ultimately had a better quality of life (69,2%). The initial PP appointment (T1) allows a better patient comprehension and participation in care (59.2%) and allowed them to seek and obtain more information (59.2%). One month later (T2), the PP intervention gave patients a better comprehension and participation in their care (65.5%). There was no significant difference in stress level in patients between T1 and T2. For professionals, a questionnaire taken during the intervention and 2 years later showed that they were more willing to work with PPs (83.3%). PPs also contributed a unique and complementary perspective for patients while improving healthcare services (83.3%). For PPs, this gave meaning to their oncologic care trajectory (62,5%) while allowing them to give back to others (62,5%).

Conclusions: The integration of PPs into oncology healthcare teams benefits both patients, PPs as well as the care team. This constitutes an innovative model allowing a more patient-centered and humanistic approach in oncology.

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A FRAMEWORK FOR REAL-WORLD CLINICAL IMPLEMENTATION OF TECHNICAL INNOVATIONS IN RADIATION ONCOLOGY

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Purpose: To develop a standard implementation methodology for clinical implementation of technical innovations in radiation oncology.

Materials and Methods: A systematic clinical implementation framework was developed to compliment the R-IDEAL framework (1) for clinical evaluation of technical innovations in radiation oncology. The development of the clinical implementation framework was grounded in principles of process design, knowledge-to-action theory and models of sustainability, scale-up and spread. To understand and define the phases of development work required for successful clinical implementation, a prospective observational design was used with the MR-Linac as the test case. Disease site clinical leads collaborated with the interdisciplinary MR-Linac technical team to plan and deliver MR-guided adaptive radiotherapy (MRgART) on the MR-Linac. As new patient cohorts were introduced into the MR-Linac clinical workflow, an iterative process was leveraged to further refine the phases of work with feedback from operational team members.

Results: The knowledge required and activities involved, for simulation, treatment planning and adaptive treatment delivery, were identified and refined in order to safely and effectively deliver MRgART on the MR-Linac. The phases of the framework include (1) Process Identification, (2) Process Development, (3) Process Prototyping, (4) Implementation, Normalization and Evaluation and (5) Monitoring and Improvement. Each phase is executed consecutively with checkpoints and deliverables associated with the process, along with ongoing monitoring and evaluation of identified measures and key quality indicators. Observations during the implementation of 3 patient cohorts have highlighted the need for: building technical team expertise; actively creating opportunities for knowledge exchange and collaborative protocol development with the disease site leads and technical team; and clarity of roles and responsibilities of the interdisciplinary team. Additionally, observations demonstrated the need to have a robust process to efficiently refine clinical protocols and operational tools based on audit findings and feedback mechanism to ensure the operational team is appropriately supported during Phase 3 and 4.

Conclusions: A methodical, multi-phased implementation strategy is associated with successful clinical implementation of MRgART on the MR-Linac across patient cohorts. The development and execution of the phases within the framework suggests that a framework grounded in theory can be used to practically drive sustained clinical use and scale up of novel radiation technologies to improve patient access.

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EVALUATING THE ONCOLOGY RESEARCH INTERNSHIP (ORION) DURING THE COVID-19 PANDEMIC: A COMPARISON OF VIRTUAL AND IN-PERSON ITERATIONS

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Purpose: The Oncology Research Internship (ORIoN), a novel resident-supervised initiative for medical students (MS), was first established in 2018 and found to be mutually beneficial to both residents and MS. The COVID-19 pandemic halted many scholarly programs, including ORIoN, which relied heavily on mentorship through in-person interactions. We report results of

the first virtual program, adapted to the COVID-19 pandemic, and compare participant feedback to previous in-person iterations.

Materials and Methods: ORIoN application details were published online and emailed to first- and second-year MS. A panel of three physicians reviewed and scored applications independently. Successful MS applicants were paired with volunteer resident supervisors; each pair supervised by a staff oncologist. Compared to previous years, all meetings, correspondences and presentations between MS, residents, and supervising oncologists were conducted exclusively remotely. Only chart reviews were conducted on-site by MS. At the program's conclusion, each MS delivered a live virtual oral presentation of their completed case report, previously done in-person. Resident and MS participants completed questionnaires pre-/post program. Responses were collected on a 5-point Likert scale with open-ended free-text responses. Survey results from this virtual and the previous in-person programs were compared.

Results: Of 54 applications (previously 32 in 2018), 9 MS (three first-year, six second-year) were accepted and assigned to nine volunteer residents (six radiation oncology, two medical oncology, one pathology). To date, nine manuscripts have been completed with two submitted for publication (one published, one under review). Survey response rates were 100% (9/9) for residents and 89% (8/9) for MS. In the post-program surveys comparing the virtual and prior in-person programs, 87.5% (7/8) MS felt comfortable completing a clinical research project (22% strongly agree (SA), 62.5% agree (A), previously 25% and 75% respectively) and 100% (8/8) felt comfortable writing a case report (50% SA, 50% A, previously 75%, 25% respectively). All MS felt comfortable giving an oral research presentation (37.5% SA, 62.5% A) and teaching another MS to complete a case report (37.5% SA, 50% A). Similar to the in-person program, MS unanimously agreed that ORIoN was a beneficial experience (100%) and felt the program contributed to their career goals (100%, previously 88%). Post-program, all residents felt comfortable as a supervisor (67% SA, 22% A, previously 33%, 67% respectively), reviewing manuscripts (56% SA, 33% A, previously 33%, 50% respectively) and providing constructive feedback to trainees (67% SA, 33% A, previously 17%, 67% respectively).

Conclusions: Compared to the previous in-person program, the virtual ORIoN retained strongly favourable ratings from MS and residents alike. These findings support adapting similar scholarly and mentorship programs to a virtual setting when in-person interactions are not feasible.

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THE ROLE OF CAPRA SCORE AS A PREDICTOR OF OUTCOMES IN HIGH-RISK PROSTATE CANCER PATIENTS TREATED WITH EBRT PLUS HDR BRACHYTHERAPY BOOST

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Purpose: This study aims to report clinical outcomes of high-risk prostate cancer (PCa) patients treated with external beam radiation therapy (EBRT) and high dose-rate boost (HDRB) according to CAPRA score.

Materials and Methods: The study sample consisted of 361 high-risk PCa patients according to D'Amico classification and treated with EBRT and HDRB and antiandrogen therapy (ADT) between 1999 and 2016. We conducted retrospective competing-risk survival analyses to compare individuals with a CAPRA score lesser than or equal to five and greater than five on biochemical relapse (BCR) and metastasis incidence. Kaplan-Meier analysis was performed to assess overall survival (OS). Subsequently, we used ROC curves to compare the performance of the CAPRA model to an adapted form of the MSKCC stratification tool on BCR and metastasis incidence.

Results: The mean age of the patients at treatment time was 69.6±7.3 years. The median follow-up was 55.5 months. Of the 361 individuals, 52,4 % (n=189) had a CAPRA score above five. In comparison to individuals with a CAPRA score lesser than or equal to five, individuals with a CAPRA score above five were deemed at higher risk of BCR (sHR = 2.74, 95% CI: 1.12-6.66, p=0.027) and demonstrated a tendency towards significance in their metastasis incidence (sHR 2.33 95% CI: 0.89-6.12, p=0.085). For 10-year OS, there was a HR for mortality of 1.89 (95% CI: 1.04-3.43, p=0.036) for individuals with a CAPRA score above five. There was no significant difference between either risk stratification strategy in ROC curves analysis.

Conclusions: The data suggest that patients' tumours classified as high-risk using the CAPRA score correlated with a higher risk of BCR, metastasis, and mortality when compared to lower-risk tumours. Further studies are needed to validate the use of the CAPRA score to predict cancer-specific mortality (CSM) as an additional risk stratification tool.

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CALCIFICATION AND IMAGE GUIDED RADIOTHERAPY FOR LOCALIZED HIGH-RISK PROSTATE CANCER

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Purpose: Fiducial markers have been used in hypofractionated image-guided radiotherapy (HIGRT) of prostate cancer to improve localization of the target and accuracy of treatment delivery. However, their insertion is an invasive procedure with some associated risks and increased costs. Calcification inside the PTV (CIP) may be a natural fiducial marker. We reviewed CT scan images of prostate cancer patients treated with HIGRT without fiducial markers, to determine the frequency of CIP and to compare potential differences in toxicity between patients with and without CIP.

Materials and Methods: We retrospectively reviewed planning CT and CBCT scans of high-risk prostate cancer patients treated in our institution with moderate HIGRT (60Gy/20 fractions in 4 weeks), all without fiducial markers. CT slice thickness measured 3 mm. The PTV margin was 7mm from prostate. The presence of CIP should be visible in both the planning CT and CBCT scans. GU and GI toxicity were prospectively scored according to the CTCAE.v3.

Results: Between November 2012 and August 2015, 100 consecutive cases that had CBCTs were reviewed. We observed 16 cases (16%) without and 84 (84%) with CIP in both the planning CT and CBCT images. In two-thirds of patients, two or more CIP were seen on the imaging studies. Median follow-up was 64 months.

Acute Grade 2 or greater toxicity in patients with or without CIP was as follows: GI 10% and 11%, and GU 2% and 20%, respectively. Similarly, late Grade 2 or greater toxicity was as follows: GI 4% and 2%, and GU 4% and 3%, respectively.

Conclusions: In patients undergoing radiotherapy for prostate cancer, the presence of CIP was high (84%). This observation is consistent with other publications. Acute and late GU or GI toxicity were similar in patients with or without CIP. Maybe routine insertion of fiducial markers can be avoided in HIGRT.