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Current Use and Perspectives of Artificial Intelligence in Radiation Oncology: A Statewide Consortium Survey

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Purpose/Objective(s): Artificial Intelligence (AI) shows promise in streamlining clinical workflow in radiation oncology from initial consultation to treatment delivery. Stakeholder input is essential for this potential to be realized. Within the diverse practices of a statewide radiation oncology quality consortium, we sought to assess the current and future state of AI implementation in the radiation oncology clinic.

Materials/Methods: A structured online survey collected demographic information, clinical responsibilities, and workflows. In February 2024, the survey was distributed to the consortium membership using email and a QR code. The primary objective was determining AI use in Radiation Oncology as part of New Consultation, Care Navigation, Treatment Planning, and Plan Quality and Delivery. Secondary objectives included perceived barriers and facilitators to future AI adoption. Summary descriptive statistics were used; somewhat agree and strongly agree were combined to quantify responses.

Results: Of 52 respondents, 40% were physicians (n = 21/52), 21% physicists (n = 11/52), 17% dosimetrists (n = 9/52), 6% radiation therapists (n = 3/52), and 15% administrators (n = 8/52). Average age was 47 with 19 years of experience; 27% were from academic centers (n = 14/52) and 73% were from community and free-standing practices (n = 38/52), with 21 unique centers represented. Only two respondents (5%, n = 2/44) reported AI use outside of Treatment Planning. Within Treatment Planning, however, normal-tissue AI contouring was reported by 51% (n = 22/43). Of those using or piloting automated contouring software (n = 26), 65% (n = 17/26) reported >1 hour of time savings per week and 38% (n = 10/26) endorsed >2 hours per week saved. Respondents agreed that AI tools have potential to increase consistency of normal tissue contouring (93%, n = 39/40), decrease contouring time (88%, n = 35/40), improve consistency of treatment plans (83%, n = 33), and decrease time from simulation to start (70%, n = 28/40). Most (82%, n = 32/39) agreed that they would like to use more automation for patients they treat. To justify implementation, 55% (n = 21/38) desired evidence of oncologic benefit or equivalence. Barriers to implementation included quality concerns (47%, n = 18/38) and administrative challenges regarding billing (50%, n = 19/38). Some (15%, n = 6/39) were concerned about automation threatening their jobs.

Conclusion: Within a diverse statewide Radiation Oncology consortium, the predominant current AI use is concentrated within treatment planning where most respondents agree that AI can enhance workflow consistency and efficiency. The identified barriers to AI adoption highlight the need for further clinical validation, with a focus on quality along with administration and implementation support.

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Patient-Facing Electronic Medical Record Care Companion for Breast Cancer Patient-Reported Outcomes and Education during Radiation Therapy

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Purpose/Objective(s): Patient-reported outcome (PRO) collection and intervention improves disease outcomes. In our urban public hospital radiation oncology department, we created a digital "care companion" (CC) program embedded in the health system electronic medical record (EMR) to provide breast cancer (BC) radiation therapy (RT) patient education and collect PRO. We hypothesized that CC would be used by a majority of patients who had activated the mobile EMR app.

Materials/Methods: A multidisciplinary team (physicians, nurses, and information technology) oversaw CC. Because the EMR did not have an existing CC module for RT, we created a first-of-its-kind program using established and validated content. CC included weekly education, PROs at multiple timepoints during and after RT, reminder messages, and videos. Patients were eligible for the program if they had a diagnosis of BC undergoing RT, were English-literate, and had a smartphone. All patients received usual care consisting of paper-based educational materials before RT start. Patients were enrolled in CC through the EMR before the first RT fraction and instructed to download the mobile EMR app. PROs came from two source surveys: 1) National Cancer Institute PRO-CTCAE Custom Survey of 36 questions relevant to BC, and 2) EORTC-QLQ BR23 comprising 23 BC-related items. Patients completed skin reaction and pain scales weekly during RT. Educational materials were "tasked" to patients during and after RT. Reminder messages were sent by email. Nurses also verbally reminded patients about CC during clinic visits. CC ended 90 days after RT. We measured monthly patient Engagement and Task Compliance. "Engagement" is percentage of patients interacting with a task and either skipping or completing it within a specific time window (1 week for PRO surveys, 3 days for other tasks). "Task compliance" is the percentage of a specific assigned educational or PRO task that is completed each month.

Results: A total of 56 BC patients were enrolled in CC from 9/6/2023 to 2/28/2024; 40 completed the program and 16 remain enrolled. Median age was 58 years (range = 29-85). 89% of enrolled patients activated the EMR chart by app or web browser. Engagement was 21.6% on average per month (range = 6 to 38%). Average monthly task compliance ranged from 2% (for PRO-CTCAE) to 6% (for Skin and Pain scales), with monthly high of 19% in January (skin/pain scales). Throughout our hospitals, patient logins to the EMR chart after activating an account remain low at 10-11% monthly.

Conclusion: In our urban public hospital population, a novel patient-facing BC care companion EMR program had low engagement in its first six months, despite most patients activating their EMR chart. Digital interventions suffer from high dropout or disengagement. To improve usage, next steps include demonstrating CC task completion to patients in clinic, changing automatic reminders to be text-based, and surveys to understand patient reasons for disengagement. PROs will be reported after longer follow up.

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