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.

667 new starts a year after checklist implementation (2020). The reported errors were compared both before and after the checklist implementation. Errors were graded by Radiation Error Scoring System (J ACR 2009: 6 45-50) with grade 1/2 classified as near misses and grade 3/4 errors as those that caused harm to the patient to evaluate if the new safety measures impacted treatment delays or quality. Three quality measures were calculated both before and after checklist: 1- if the "checklist" delayed the patient's start or slowed down the treatment planning process, 2- if the "checklist" prevented treatment plan reworks at peer review, 3- if the checklist had any impact on the number of patients with unplanned breaks exceeding 5 or more consecutive days. The chi-squared test was performed to compare the results both before and after checklist implementation.

Results: There were no level 3 and 4 errors before or after implementing the checklist; however, the number of level 2 errors dropped from 10 to 1, and level 1 errors from 138 to 34 after implementing the checklist. Thus, the checklist reduced the number and severity of errors caught in the treatment process significantly ($P < 0.001$). The number of treatment delays due to plans not ready was 4% in the year before, and was down to 1% after the checklist showing that it did not delay the start time for patients, and improved the planning process ($P < 0.001$). On weekly peer review, the number of replans required due to changes recommended by peer feedback decreased from 2% in the year before to 1% after implementation ($P = 0.15$). Radiation breaks exceeding 5 days was 3% in the year before dropping to 2% after the implementation due to pre-treatment lab checks and management of medical issues before treatment initiation ($P = 0.2$).

Conclusion: Initiation of a pre-simulation checklist had positive impacts on patient care in both quality and safety parameters. The checklist improved the safety by significantly reducing the number and severity of medical errors, and improved quality by reducing the number of treatment delays, the proportion of patients with unplanned treatment breaks and plan reworks at peer review.

Author Disclosure: J.C. Greenwalt: None. A. Grietens: None. L. O'steen: None. O.M. Mahmoud: None.

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Infection Prevention, Operational Workflows, and Implementation Checklists for Whole-Lung Low-Dose Radiation Therapy (LD-RT) for COVID-19-Related Pneumonia

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Purpose/Objective(s): Low-Dose Radiation Therapy (LD-RT) is an emerging treatment option for patients with COVID-19 related pneumonia. Infectivity of the SARS-CoV-2 virus complicates incorporation of LD-RT into existing radiation oncology clinics.

Materials/Methods: The first phase I/II trial of LD-RT for COVID-19-related pneumonia implemented novel operational protocols to address risk of infection and respiratory events. Patients were transported from hospital rooms to linear accelerators and treated with 0.5 Gy or 1.5 Gy using pre-planned, two-dimensional treatments prepared using diagnostic x-rays and caliper measurements. Workflows were revised over time to balance infection risks with implementation burden.

Results: Between April 24 and December 7, 2020, fifty-two patients were enrolled and forty were treated. The end-to-end process comprised 16 distinct teams and > 120 cooperating staff members (> 50 core radiation oncology staff). The trial was operationalized at two hospitals at the onset of the COVID-19 pandemic, prior to vaccine availability. Teams included trial leadership/screening (n > 4), inpatient floor staff (n > 10), clinical trials staff and coordinators (n = 8), transport (n = 2), radiation therapists (n > 20), respiratory therapists (n = 5), radiation nursing (n > 7), ICU nursing (n = 4), rapid response teams (n = 4), medical physics (n > 4), dosimetry (n > 3), infection prevention (n > 3), environmental services (n > 6), security (n = 7), lab personnel (n = 1), and physicians from radiation oncology (n = 7), infectious diseases (n = 2), pulmonary/critical care medicine (n = 2), anesthesia (n = 2), and internal medicine (n > 20) [total > 120]. All non-intubated patients were transported by a multi-disciplinary team, consisting of a physician, nurse, transporter, infection prevention specialist, and (when needed) a respiratory therapist. Treatments occurred after normal clinic hours, were initiated by team huddles, check lists, and included personal protective equipment supervision at multiple time points. Transport routes were 880 to 1760 feet (0.33 miles) one-way, with 1 to 3 elevator banks and required 20-35 minutes for round-trip transport and treatment. Oxygen supplementation in non-intubated patients ranged from 2 to 15 L/min. One intubated patient was transported with a portable ventilator and accompanying ICU staff. There were no code-level events during transport. No patient-facing staff contracted COVID-19 from trial activities. Workflow burden was successfully reduced and protocols relaxed over time with increased staff experience.

Conclusion: Whole-lung low-dose radiation therapy (LD-RT) for COVID-19-related pneumonia was successfully incorporated into existing workflows at a major academic university. Forty patients were treated with no code-level events, and no staff contracted the virus during eight months of trial accrual. Instructional materials and implementation check lists are provided.

Author Disclosure: A.L. Preston: None. C.B. Hess: Patent/License Fees/Copyright; Provisional patent. T.Y. Eng: Stock; Amgen. M. Washington: None. J. Holdsworth: None. J. Swift: None. N. Stafford: None. W. Burns: None. R. Reeves: None. H. Majors: None. E. Voigt: None. V. Chacko: None. R. Mittenzwei: None. B. Frisle: None. K.D. Godette: None. B. Ghavidel: None. D.J. Murphy: None. J.T. Jacob: None. J.P. Steinberg: None. M.K. Khan: Research Grant; Merck Pharmaceutical. Patent/License Fees/Copyright; Provisional patent.

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"Brachy-mergency!": Developing and Implementing an Effective HDR Emergency Response Training Course

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Purpose/Objective(s): A stuck HDR source during brachytherapy (BT) treatments is rare but serious medical emergency. A rapid and coordinated response by providers is necessary to limit exposure and avoid serious injury to the patient. At our institution, previous training consisted of informal verbal instruction and review of the HDR workflow, resulting in considerable variability in preparedness. As a quality improvement project, we developed a standardized BT emergency training program to improve the confidence and preparedness of our staff in responding to and resolving such emergencies.

Materials/Methods: We developed an educational course using vendor material, AAPM Task Group publications, reviewed high-profile BT accidents, and integrated suggestions from physics and clinical faculty. Before and after the training session, participants completed an online quiz and survey to assess baseline knowledge and confidence (5-point Likert scale). Participants first underwent a timed simulation that required manual source retraction. This simulation was also repeated at the end of the training session. Next an educational 1-on-1 discussion and presentation was conducted to review the structure, function, and workflow of BT treatments and all equipment involved. We reviewed and virtually drilled the