

Short Note

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Short Note

# Image Guided Superficial Radiation Therapy Expands Access to a Multidisciplinary Cancer Care Model that Optimizes Outcomes for Underserved Rural Medicare Beneficiaries

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**Abstract:** The shortage of physicians in rural communities contributes to increased mortality rates among Medicare beneficiaries. This increase in mortality risk is commonly due to diseases such as heart disease and cancer, including melanoma and non-melanoma skin cancer (NMSC). Mohs micrographic surgery (MMS) is considered the gold-standard treatment for NMSC tumors, however, due to a shortage of dermatologists and Mohs surgeons in rural areas, access to MMS is limited. In these areas, image guided superficial radiation therapy (IGSRT) serves as a viable option for the treatment of NMSC lesions, with fewer recurrences and 99% cure rates, which are comparable to MMS cure rates. IGSRT is performed in dermatology clinics with support from a multidisciplinary team, including radiation therapists, medical physicists, radiation oncologists, and dermatologists. As IGSRT is able to be performed by general dermatologists, Medicare beneficiaries in rural communities will have an increase in access to treatment options and a decrease in delayed skin cancer treatment.

**Keywords:** non-melanoma skin cancer; image guided superficial radiation therapy; Mohs micrographic surgery; basal cell carcinoma; squamous cell carcinoma; superficial radiation therapy

Physician shortages cause higher mortality rates for rural Medicare beneficiaries. The two main diseases primarily responsible for increasing rural mortality rates are heart disease and cancer [1]. The lack of access to dermatologists in rural areas has led to a higher risk of death from melanoma in rural Medicare beneficiaries [2]. New research demonstrates that more patients are dying from nonmelanoma skin cancer (NMSC) than melanoma worldwide [3,4]. In underserved areas that lack dermatologists, there are poorer outcomes for cutaneous malignancies [5].

Mohs micrographic surgery (MMS) is currently the gold standard treatment for NMSC due to its high cure rates ranging between 95-99% [6-8]. However, there is a significant maldistribution of surgeons, with only 11% of dermatologists performing Mohs surgery, and 95% of rural or non-metro counties lacking a Mohs surgeon [2]. Image Guided Superficial Radiation Therapy (IGSRT) has a 99% cure rates for the noninvasive treatment of NMSC [9-12], and a recent meta-analysis demonstrated that IGSRT has fewer recurrences than MMS [13]. Thus, by this analysis, IGSRT should also be considered a gold standard treatment for NMSC.

The 2024 NCCN guidelines state that when considering radiation therapy (RT) for any cutaneous squamous cell carcinoma (SCC) or basal cell carcinoma (BCC), the “de-termination of the appropriateness of RT should be performed by a radiation oncologist” [14,15]. These guidelines are unreasonable and impractical because dermatologists have a long history of independently using radiation treatments for skin conditions. Furthermore, there is a shortage of radiation oncologists in rural communities. Only 13% of radiation oncologists practice in rural areas [16]. Additionally, the need for rural residents to travel for RT increases costs in time, fuel, and environmental stress. Thus, by these guidelines, rural Medicare beneficiaries would continue to experience significant delays in receiving care and subsequently poorer skin cancer outcomes.

IGSRT is conducted in a dermatology clinic setting that is supported by a multidisciplinary team consisting of a radiation therapist, medical physicist, radiation oncologist and a dermatologist, all with > 5 years of direct hands-on clinical experience in the safe and effective delivery of IGSRT. Every IGSRT study demonstrating minimal patient toxicity and 99% cure rates in the treatment of NMSC was conducted in this fashion [9–12].

While dermatologists have a long history of using SRT without a multidisciplinary team, IGSRT is much more complex than SRT. During IGSRT radiation therapists monitor changing tumor depth and radiobiologic effectiveness using high resolution dermal ultrasound (HRDUS) imaging at a frequency of 20-22 MHz. Based on these measurements, RTTs make adaptive radiotherapy changes in energy (kV), TDF (time, dose fractionation), dose and boost in real time. In addition, radiation therapists, medical physicists and radiation oncologists assist dermatologists with complex scenarios like tumors located on convex and concave surfaces, proximity to vital structures like the eyes, potential areas of overlap with anatomic areas previously exposed to ionizing radiation, etc. A tumor board hosts weekly virtual grand rounds providing a continuous forum for ongoing education that directly informs dermatologists and their multidisciplinary teams best practices and standards of care for treatment of NMSCs with IGSRT.

For all of the reasons listed above, the gold standard for the safest, most effective delivery of IGSRT is in a dermatology clinic by a dermatologist that is supported by a multidisciplinary team. The presence of a radiation oncologist on the IGSRT multidisciplinary team also fulfills the current NCCN guidelines for RT for SCCs and BCCs. This provides rural CMS beneficiaries with a high level of cancer care that can be accessed immediately.

IGSRT provides a gold standard model of non-melanoma skin cancer care that compensates for physician shortages commonly experienced by Medicare beneficiaries in rural areas. These shortages are present because 95% of rural counties do not have a Mohs surgeon and only 13% of radiation oncologists practice in rural areas.[2,13] For rural Medicare beneficiaries who lack access to Mohs surgery and radiation oncology specialists, IGSRT solves the access problem. IGSRT accomplishes this goal by providing rural general dermatologists (who outnumber Mohs surgeons 10 to 1) with a multidisciplinary cancer care team to provide skin cancer treatment without delay. Studies have proven that IGSRT’s multidisciplinary approach consistently delivers 99% cure rates and minimal toxicity.[9–12] In addition, the presence of a radiation oncologist on the IGSRT multidisciplinary team means that the IGSRT model of care is qualified to “determine the appropriateness of RT” in treating NMSC per the NCCN guidelines.

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