

Brief Opinion

Improving the Clinical Treatment of Vulnerable Populations in Radiation Oncology



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Abstract The increasing role of radiation oncology in optimal cancer care treatment brings to mind the adage that power is never a gift, but a responsibility. A significant part of the responsibility we in radiation oncology bear is how to ensure optimal access to our services. This article summarizes the discussion initiated at the 2019 American Society for Radiation Oncology Annual Meeting educational panel entitled “Improving the Clinical Treatment of Vulnerable Populations in Radiation Oncology: Latin, African American, Native American, and Gender/Sexual Minority Communities.” By bringing the discussion to the printed page, we hope to continue the conversation with a broader audience to better define the level of responsibility our field bears in optimizing cancer care to the most vulnerable patient populations within the United States.

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Cancer Disparities Among Northern Plains American Indians

Northern Plains American Indians (AIs) have some of the highest cancer mortality rates in the United States.¹ Some of the key contributors difficult to overcome in a

short period include poverty, unemployment, and underfunding of Indian Health Service. Potential areas that can be addressed include community cancer education, smoking cessation, increased access to cancer screening and earlier detection, removal of barriers that prevent patients from being diagnosed and treated with earlier stages of disease, and enrollment on clinical trials.^{2,3}

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The cancer disparity program, Walking Forward (WF), began in 2002 after receiving National Cancer Institute (NCI) funding to address these disparities through behavioral research, patient navigation, and enrollment on clinical trials.⁴ Phase II clinical trials were conducted for common disease sites (prostate and breast cancer), emphasizing a reduction in treatment times using intensity-modulated radiation therapy and brachytherapy, as it was hypothesized that the 140 miles AIs live from the cancer center was a barrier to treatment.^{5,6} After 10 years, critical outcomes included facilitating cancer screening for 3300 patients, a 10% (4500) accrual rate on clinical trials (the highest in the nation), increased compliance for those undergoing cancer treatment, identification of specific barriers to effective cancer screening and cancer care, successful completion of a genetic study (Ataxia Telangiectasia Mutated), establishment of trusting partnerships with AI communities, creation of research infrastructure to address new research questions, and ongoing strategies to maintain sustainability.^{7,8}

WF completed a smoking cessation randomized controlled trial to address the smoking rates of 30% to 50% in tribal communities. For patients making it to the quit date, the smoking cessation rate was 13% at 1 year from the quit date; however, when analyzing the entire cohort (N = 254), the cessation rate was a disappointing 6%.⁹

During the past 2 years WF began a lung cancer screening program using low-dose computed tomography (LDCT) for the entire western part of South Dakota as AIs have the highest lung cancer mortality rate in the United States (95%).¹⁰ We are investigating this through community workshops, physician education, and removal of LDCT access barriers, and have seen an increase in LDCT rates by 30% during the past 2 years.

Using the model of cancer control as a Complex Adaptive System, as recently detailed by the National Academies of Sciences, Engineering, and Medicine report,¹¹ we have succeeded in maintaining our cancer disparity program through extensive collaborations, hiring community staff who are AI, comprehensive patient navigation, responding to “community signals” by staff adapting and changing to community needs, absolute persistence and the motivation to help the underserved. We recently received R01 funding from the National Cancer Institute to initiate a 5-year multi-institutional palliative care project on the reservations as it is essentially nonexistent at the present time.

WF has become a community model for cancer control bridging the cancer continuum from education, early detection, implementation of standard cancer care—often part of a clinical trial, and most recently palliation. Preliminary evidence from our program suggest that AIs with screen detectable cancers are now presenting with earlier stages of disease.³

Intervening to Address the Pervasive Crisis of Radiation Therapy Access Disparities Facing Black Patients

Health disparities research in radiation oncology is a relatively new field of study, with more than 70% of peer-reviewed work being published since the beginning of 2014.¹² Radiation therapy (RT) access disparities face blacks for cancers of several sites, including prostate, lung, gynecologic, hematologic, and head and neck among others.¹³ However, the most common cancer examined in black RT access disparities research has been breast cancer, which is by far the most common diagnosed form of cancer among black women (32%).^{13,14} As the most commonly studied malignancy with regard to black RT access disparities, breast cancer provides a prime opportunity to address barriers impeding equal access to quality-of-life improving and potentially life-saving treatment.

The Early Breast Cancer Trialists' Collaborative Group landmark meta-analysis of nearly 11,000 patients participating in 17 randomized trials has established that for every 4 local breast cancer recurrences prevented by RT, one death is prevented.¹⁵ Consequently, any disparity in optimal breast cancer RT access facing blacks has potentially fatal consequences.

Compared with white women with breast cancer, black women are significantly more likely to experience RT treatment delays,¹⁶ 48% more likely to have RT omission during treatment,¹⁷ and 167% less likely to receive timely completion of RT after breast-conserving surgery.¹⁸

With equivalent outcomes and side effect profiles between hypofractionated and standard fractionation breast cancer RT regimens firmly established by level I evidence,^{19,20} the 30% to 40% reduction in overall treatment time provided by hypofractionation increases RT completion rates compared with conventional fractionation 37-fold.^{21,22} Increasing access to hypofractionation (strongly supported by American Society for Radiation Oncology guidelines after breast-conserving surgery) therefore represents a prime opportunity to transition from merely reporting RT access disparities toward actually rectifying these disparities in black patients.²³ Additionally, accelerated partial breast irradiation, including intraoperative radiation therapy, may represent another strategy to further reduce treatment duration, but additional discussion is beyond the scope of this article.²⁴

In an era where income disparity in the United States (the top 0.1% of incomes equaling the bottom 90%) is approaching a rate not seen since before the Great Depression nearly 100 years ago, combined with the epidemic rise of cancer drug prices,²⁵⁻²⁷ the effect of hypofractionation on alleviating the monetary cancer care burden for black patients (because out-of-pocket costs

such as co-payments increase with the number of fractions administered, and for newer techniques such as intraoperative RT) cannot be overstated. Median white household income is presently 86 times more than that of blacks and projected to increase to 99 times by 2024; not surprisingly, blacks have been shown to have disproportionate financial toxicity after RT compared with white patients.^{28,29}

Our ongoing Navigator-Assisted Hypofractionation (NAVAH) program is currently working to address these issues. NAVAH uses a patient navigator to target newly diagnosed black breast cancer patients for the purposes of: (1) steering them toward standard of care treatment (breast surgery, medical oncology, radiation oncology), (2) increasing access to hypofractionated whole breast RT, and (3) providing access to a breast cancer support group.

NAVAH represents an active prospective intervention designed to increase black breast cancer patient access to hypofractionated RT, serving as an example of progression from reporting RT access disparities toward intervening to remedy them.

Improving Access and Treatment for the Hispanic and Latinx Population

By the most recent US Census, 57.5 million Americans identified their ethnicity as Hispanic or Latinx, representing 18% of the entire US population—a 43% increase from the 2000 US Census.³⁰⁻³³ The Hispanic population is most prevalent in California (27.8%), Texas (18.7%), Florida (8.4%), and New York (6.8%)—the only states with at least 5% Hispanic population according to the 2010 US Census.³⁴

Cancer is the leading cause of death in the Hispanic population, manifesting as 21% of total deaths with a death rate of 110.8 per 100,000.³⁴ In Hispanic men, the leading sites of new cancer cases are prostate, colorectal, and lung, with the leading sites of cancer deaths being lung, liver, and colorectal.³⁵ In Hispanic women, breast is the most common site of cases and deaths followed by lung and colorectal.³⁵

In a 6-city National Cancer Institute-funded study where abnormal mammogram screening results were examined for the endpoint of time to obtain definitive diagnosis, Latinas took 2.2 times longer to reach 50% diagnosis and 3 times longer to reach 80% diagnosis compared with non-Hispanic whites.³⁶ A study examining the effect of primary Spanish language on breast cancer presentation found that 87% of Hispanic patients presenting as stage III or IV identified Spanish as their primary language, and that compared with the 94% of non-Hispanic whites and 91% of primary English language Hispanics, only 38% of primary Spanish language Hispanics had medical insurance.³⁷ A Surveillance,

Epidemiology, and End Results analysis found that Hispanic foreign-born women had lower rates of both early-stage breast cancer and receipt of RT after breast-conserving surgery than either US-born Hispanic or white women.³⁸ Despite overall decreased access to cancer care (including RT) regardless of organ site, Hispanic Americans are less likely to have disparities in mortality compared with other minorities, predominantly black patients.³⁹ However, for prostate cancer, a recent study demonstrated that although Hispanic patients have lower mortality than blacks, disaggregate data examining Hispanic subgroups revealed that Puerto Rican, Mexican, and Cuban patients have higher mortality and South and Central Americans had lower mortality than blacks.⁴⁰

The disparities in receipt of treatment and mortality facing Hispanic cancer patients—particularly compared with white patients—are sobering given the results of a recent study examining 38 Southwest Oncology Group (SWOG) trials performed between 1986 to 2012 which found no differences in survival between Hispanic and non-Hispanic patients across tumor types.⁴¹ Such a result indicates that access to optimal care, rather than genetic differences in tumor biology, is the reason for the stark difference in outcomes.

One program for addressing these disparities has occurred in Miami, Florida, through the Sylvester Office of Outreach and Engagement, a field-based community health worker program that served nearly 20,000 Hispanic people in 2018. Similar outreach programs will be necessary nationwide to address disparities in optimal cancer care by increasing accrual into clinical trials, given that both the size and diversity of Hispanic Americans continues to dramatically increase in the United States.

Cancer Disparities Facing Sexual or Gender Minorities

A minimum of 500,000 adult cancer survivors in the US identify as sexual or gender minority (SGM) individuals, including lesbian, gay, bisexual, transgender, or queer identities.⁴² Recently, published literature has begun to elucidate the disproportionate cancer burden faced by this patient population.

Associations between certain malignancies and risk of diagnosis or disease-specific mortality have been found within this population. Anal cancer is elevated in men who have sex with men relative to overall US male population regardless of human immunodeficiency virus status.^{43,44} Sexual minority men are more likely to have a lifetime history of any type of skin cancer.⁴⁵ Sexual minority women may have higher breast cancer mortality despite similar breast cancer risk to the general population.⁴⁶ Furthermore, a 2017 study suggests an increased

risk of oropharynx cancer in sexual minority women relative to heterosexual counterparts.⁴⁷

Disparities have also been identified in cancer prevention and screening. For those undergoing cervical cancer prevention, lesbian women initiate human papillomavirus vaccination at less than one-third the rate of heterosexual women,⁴⁸ and cervical cancer screening may be lower in lesbian or bisexual women.⁴⁹ Transgender men are more likely than cisgender women to have unsatisfactory pap smear testing.⁵⁰ For breast cancer screening, bisexual women and transgender individuals are less likely than heterosexual women to meet mammography guidelines despite similar disease risk.⁵¹ American Society of Clinical Oncology recently highlighted barriers to care facing the SGM population, including lack of insurance, fear of stigmatization, inadequate evidence-based knowledge resulting in suboptimal care or survivorship planning, and exclusion from screening campaigns and clinical trials.⁵²

SGM individuals may differ fundamentally in their experiences with treatment of various cancers. For prostate cancer, unique posttreatment sexual quality-of-life challenges regarding anorectal and erectile function have been reported in SGM.⁵³⁻⁵⁶ Posttreatment anorectal toxicity can make receptive anal intercourse painful and may contribute to hematochezia.^{53,54} Current sexual health questionnaires have not been designed to include this population, a subgroup unaddressed in studies examining treatment effect on sexual function.⁵⁶ Unique precautions after brachytherapy seed implantation for prostate cancer have been detailed; one study recommended minimizing receptive anal intercourse in the immediate postimplantation period owing to safety concerns of exposure of the penis of the other partner.⁵⁷ In breast cancer survivors, attitudes of breast reconstruction among lesbian women undergoing mastectomy has been reported; communication should be evaluated to reduce heterosexist bias.⁵⁸ The decision to undergo breast reconstruction is value-laden and may be influenced by sexual orientation or gender identity. To improve oncologic disparities among SGM individuals, American Society of Clinical Oncology recommends addressing barriers, from personal to systematic research levels across our health care system, in a coordinated, energetic fashion.⁵²

Overall, SGM individuals face cancer disparities ranging from disease-specific risk and cancer prevention or screening strategies, to unique treatment-related experiences encountered by these patients. Awareness of these disparities is a first step toward bridging these gaps, in an effort to foster inclusive and welcoming environments. Ultimately, it is paramount that medical providers individualize how we counsel and care for the specific and unique needs of these patients.

Conclusions

It is clear that treatment disparities exist for vulnerable communities accessing cancer care. Additional research, awareness, and advocacy are sorely needed to address these critical gaps in oncologic care. As we strive to innovate and find new and better ways to treat cancer, we must continue to be intentional to ensure our vulnerable communities receive the care they need and deserve. It is our solemn responsibility to use our power to heal and include our most vulnerable to improve health equity.

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