Brief Opinion

Improving the Clinical Treatment of Vulnerable Populations in Radiation Oncology

Shearwood McClelland III, MD,a Daniel G. Peteroit, MD, FASTRO,b Ross Zeitlin, MD,c Cristiane Takita, MD, MBA,d Gita Suneja, MD, MS,e Robert C. Miller, MD, MBA, FASTRO,f Curtiland Deville, MD,g and Malika L. Siker, MDc,*

“Department of Radiation Oncology, Indiana University School of Medicine, Indianapolis, Indiana; bRapid City Regional Cancer Care Institute, Rapid City, South Dakota; cDepartment of Radiation Oncology, Medical College of Wisconsin, Milwaukee, Wisconsin; dDepartment of Radiation Oncology, University of Miami Sylvester Comprehensive Cancer Center, Miami, Florida; eDepartment of Radiation Oncology, University of Utah, Salt Lake City, Utah; fDepartment of Radiation Oncology, University of Maryland School of Medicine, Baltimore, Maryland; gDepartment of Radiation Oncology, Johns Hopkins Kimmel Cancer Center, Baltimore, Maryland

Received 27 April 2020; revised 11 June 2020; accepted 17 July 2020

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.

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 under-funding 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

Sources of support: Dr McClelland receives research support from the Indianapolis Public Transportation Corporation. Dr Peteroit is the president of the American Brachytherapy Society and receives research funding from Bristol-Myers Squibb Foundation, Polo Ralph Lauren, and the Irving A Hansen Memorial Foundation. Dr Suneja receives research support from the National Institutes of Health (K08 CA228631).

Disclosures: none.

* Corresponding author: Malika L. Siker, MD; E-mail: msiker@mcw.edu

https://doi.org/10.1016/j.adro.2020.07.018

2452-1094/© 2020 The Authors. Published by Elsevier Inc. on behalf of American Society for Radiation Oncology. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
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 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 commonly 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.

References

1. McClelland S 3rd, Leberknight J, Guadagnolo BA, Coleman CN, Petereit DG. The Pervasive crisis of diminishing radiotherapy access for vulnerable populations in the United States: Part 2: American Indian patients. Adv Radiat Oncol. 2018;3:3-7.
2. Guadagnolo BA, Boylan A, Sargent M, et al. Patient navigation for American Indians undergoing cancer treatment. Cancer. 2011;117:2754-2761.
3. Guadagnolo BA, Petereit DG, Coleman CN. Cancer care access and outcomes for American Indian populations in the United States: Challenges and models for progress. Semin Radiat Oncol. 2017;27:143-149.
4. Petereit DG, Rogers D, Govern F, et al. Increasing access to clinical cancer trials and emerging technologies for minority populations: The Native American project. J Clin Oncol. 2004;22:4452-4455.
5. Ritter MA, Forman JD, Kupelian PA, et al. A phase I/II trial of increasingly hypofractionated radiation therapy for prostate cancer. Int J Radiat Oncol Biol Phys. 2009;75(Suppl):S80-S81.
6. Petereit DG, Omidpanah A, Boylan A, et al. A multi-faceted approach to improving breast cancer outcomes in a rural population, and the potential impact of patient navigation. S D Med. 2016;69:268-273.
7. Petereit DG, Moser Hahn H, et al. Ataxia Telangiectasia Mutated (ATM) gene variants in American Indians. American Society of Therapeutic Radiation Oncology 2010 Annual Meeting. Int J Radiat Oncol Biol Phys. 2010;78(Suppl 3):S90.
8. Petereit DG, Ashleigh Guadagnolo B, Wong R, Coleman CN. Addressing cancer disparities among American Indians through innovative technologies and patient navigation: The Walking Forward experience. Front Oncol. 2011;1:11.
9. Dignan MD, Jones K, Burhansstipanov L, et al. A randomized trial to reduce smoking among American Indians in South Dakota: The Walking Forward Study. Contemp Clin Trials. 2019;81:28-33.
10. Plescia M, Henley SJ, Pate A, Underwood JM, Rhodes K. Lung cancer deaths among American Indians and Alaska Natives, 1990-2009. Am J Public Health. 2014;104:S388-S395.
11. National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Committee on a National Strategy for Cancer Control in the United States. Guiding cancer control: A path to transformation. In: Amankwah FK, Madhavan G, Johns MME, eds. The National Academies Collection: Reports Funded by National Institutes of Health. Washington, DC: National Academies of Sciences; 2019.
12. McClelland S 3rd, Deville C, Thomas CR Jr, Jaboin JJ. An overview of disparities research in access to radiation oncology care. J Radiat Oncol. 2016;5:437-444.
13. McClelland S 3rd, Page BR, Jaboin JJ, Chapman CH, Deville C Jr, Thomas CR Jr. The pervasive crisis of diminishing radiation therapy
access for vulnerable populations in the United States, part 1: African-American patients. *Adv Radiat Oncol.* 2017;2:523-531.
14. American Cancer Society. *Cancer Facts & Figures for African Americans* 2016-2018. Atlanta: American Cancer Society; 2016.
15. Early Breast Cancer Trialists’ Collaborative Group (EBCTCG), Darby S, McGale P, et al. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: Meta-analysis of individual patient data for 10,801 women in 17 randomised trials. *Lancet.* 2011;378:1707-1716.
16. Freedman RA, He Y, Winer EP, Keating NL. Racial/ethnic differences in receipt of timely adjuvant therapy for older women with breast cancer: Are delays influenced by the hospitals where patients obtain surgical care? *Health Serv Res.* 2013;48:1669-1683.
17. Mandelblatt JS, Kerner JF, Hadley J, et al. Variations in breast carcinoma treatment in older Medicare beneficiaries: Is it black or white. *Cancer.* 2002;95:1401-1414.
18. Powers BD, Montes JA, Nguyen DC, et al. Demographic risk factors impacting timely radiation therapy completion after breast-conserving surgery. *Am J Surg.* 2015;210:891-895.
19. Whelan TJ, Pignol JP, Levine MN, et al. Long-term results of hypofractionated radiotherapy for breast cancer. *N Engl J Med.* 2010;362:513-520.
20. START Trialists’ Group, Bentzen SM, Agrawal RK, et al. The UK Standardisation of Breast Radiotherapy (START) Trial B of radiotherapy hypofractionation for treatment of early breast cancer: A randomised trial. *Lancet.* 2008;371:1098-1107.
21. Jagsi R, Griffith KA, Boike TP, et al. Differences in the acute toxic effects of breast radiotherapy by fractionation schedule: Comparative analysis of physician-assessed and patient-reported outcomes in a large multicenter cohort. *JAMA Oncol.* 2015;1:918-930.
22. McClelland S 3rd, Burney HN, Zellars RC, Rhone RM. Whole breast radiation therapy completion in early stage breast cancer following lumpectomy. Abstract 178, San Antonio Breast Cancer Symposium, 42nd annual meeting, 2019.
23. Smith BD, Bentzen SM, Correa CR, et al. Fractionation for whole breast irradiation: an American Society for Radiation Oncology (ASTRO) evidence-based guideline. *Int J Radiat Oncol Biol Phys.* 2011;81:59-68.
24. Doria et al. Intraoperative radiation therapy for breast cancer patients: Current perspectives. *Breast Cancer (Dove Med Press).* 2017;9:257-263.
25. Dalio R. Our biggest economic, social, and political issue. Available at: https://www.linkedin.com/pulse/our-biggest-economic-social-political-issue-two-economies-ray-dalio. Published October 23, 2017. Accessed March 9, 2019.
26. White EK. Killing U.S. slowly: Curing the epidemic rise of cancer drug prices. *Food Drug Law J.* 2017;72:189-224.
27. Taylor JW, Armstrong T, Kim AH, et al. The lomustine crisis: Are delays influenced by the hospitals where patients obtain surgical care? *Health Serv Res.* 2011;38:1669-1683.
28. Collins C, Asante-Muhammad D, Hoxie J, Nieves E. The road to zero wealth: How the racial wealth divide is hollowing out American’s middle class. Available at: https://ips-dc.org/report-the-road-to-zero-wealth/. Published September 11, 2017. Accessed August 10, 2019.
29. Palmer JD, Patel TT, Eldredge-Hindy H, et al. Patients undergoing radiation therapy are at risk of financial toxicity: A patient-based prospective survey study. *Int J Radiat Oncol Biol Phys.* 2018;101:290-305.
30. Vespa J, Armstrong DM, Medina L. Current Population Reports, US Census Bureau; 2018:25-1144.
31. Bureau USC. *Census Demographic Profiles.* 2010.
32. Bureau USC. The Hispanic Population. 2010. 2011.
33. Bureau USC. 2009 American Community Survey. 2009.
34. Bureau USC. 2010 Census Summary File 1. 2010.
35. American Cancer Society. *Cancer Facts & Figures for Hispanics/Latinos* 2018-2020. Atlanta: American Cancer Society; 2018.
36. Ramirez AG, Pérez-Stable EJ, Talavera GA, et al. Time to definitive diagnosis of breast cancer in Latinas and non-Hispanic white women: The six cities study. *Springerplus.* 2013;2:84.
37. Oliveira K, Clark S, Dunn E, Mangram A. Spanish as a primary language and its effect on breast cancer presentation. *J Oncol Pract.* 2011;7:165-167.
38. Koury EM, He Y, Winer EP, Keating NL. Influence of birthplace on breast cancer diagnosis and treatment for Hispanic women. *Breast Cancer Res Treat.* 2010;121:743-751.
39. McClelland S 3rd, Perez CA. The pervasive crisis of diminishing radiation therapy access for vulnerable populations in the United States-part 3: Hispanic-American patients. *Adv Radiat Oncol.* 2017;3:93-99.
40. Chinea FM, Patel VN, Kwon D, et al. Ethnic heterogeneity and prostate cancer mortality in Hispanic/Latino men: a population-based study. *Oncotarget.* 2017;8:69709-69721.
41. Chavez-MacGregor M, Unger JM, Moseley A, Ramsey SD, Hershman DL. Survival by Hispanic ethnicity among patients with cancer participating in SWOG clinical trials. *Cancer.* 2018;124:1760-1769.
42. Cathcart-Rake EJ. Cancer in sexual and gender minority patients: Are we addressing their needs? *Curr Oncol Rep.* 2018;20:85.
43. Machalek DA, Poynten M, Jin F, et al. Anal human papillomavirus infection and associated neoplastic lesions in men who have sex with men: A systematic review and meta-analysis. *Lancet Oncol.* 2012;13:487-500.
44. SEER Cancer Stat Facts: Anal Cancer. National Cancer Institute. Bethesda, MD. Available at: https://seer.cancer.gov/statfacts/html/anus.html. Published April 2019. Accessed March 6, 2020.
45. Mansh M, Katz KA, Linos E, et al. Association of skin cancer and indoor tanning in sexual minority men and women. *JAMA Dermatol.* 2015;151:1308-1316.
46. Cochran SD, Mays VM. Risk of breast cancer mortality among women cohabiting with same sex partners: Findings from the National Health Interview Survey, 1997-2003. *J Womens Health.* 2012;21:528-533.
47. Saunders CL, Meads C, Abel GA, Lyrazopoulos G. Associations between sexual orientation and overall and site-specific diagnosis of cancer: Evidence from two national patient surveys in England. *J Clin Oncol.* 2017;35:3654-3661.
48. Agnór M, Peitzmeier S, Gordon AR, et al. Sexual orientation identity disparities in awareness and initiation of the human papillomavirus vaccine among US women and girls: A national survey. *Ann Intern Med.* 2015;163:99-106.
49. Johnson MJ, Mueller M, Ellason MJ, et al. Quantitative and mixed analyses to identify factors that affect cervical cancer screening uptake among lesbian and bisexual women and transgender men. *J Clin Nurs.* 2016;25:3628-3642.
50. Peitzmeier SM, Reisner SL, Harigopal P, Potter J. Female-to-male patients have high prevalence of unsatisfactory Paps compared to non-transgender females: Implications for cervical cancer screening. *J Gen Intern Med.* 2014;29:777-784.
51. Bazzi AR, Whorms DS, King DS, Potter J. Adherence to mammography screening guidelines among transgender persons and sexual minority women. *Am J Public Health.* 2015;105:2356-2358.
52. Griggs J, Maingi S, Blinder V, et al. Ethnic heterogeneity and prostate cancer mortality in Hispanic/Latino men: a population-based study. *Oncotarget.* 2017;8:69709-69721.
53. Urshier JM, Perz J, Kellett A, et al. Health-related quality of life, psychological distress, and sexual changes following prostate cancer: A comparison of gay and bisexual men with heterosexual men. *J Sex Med.* 2016;13:425-434.
54. Urshier JM, Perz J, Rose D, et al. Threat of sexual disqualification: The consequences of erectile dysfunction and other sexual changes for gay and bisexual men with prostate cancer. *Arch Sex Behav.* 2017;46:2043-2057.
55. Lee TK, Handy AB, Kwan W, et al. Impact of prostate cancer treatment on sexual quality of life for men-who-have-sex-with-men. *J Sex Med*. 2015;12:2378-2386.

56. Amarasekera C, Wong V, Yura E, et al. Prostate cancer in sexual minorities and the influence of HIV status. *Nat Rev Urol*. 2019;16:404-421.

57. Nasser NJ, Cohen GN, Dauer LT, Zelefsky MJ. Radiation safety of receptive anal intercourse with prostate cancer patients treated with low-dose-rate brachytherapy. *Brachytherapy*. 2016;15:420-425.

58. Wandrey RL, Qualls WD, Mosack KE. Rejection of breast reconstruction among lesbian breast cancer patients. *LGBT Health*. 2016;3:74-78.