Structural Sexism and Cancer Care: The Effects on the Patient and Oncologist

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Overview

Despite progress toward equity within our broad social context, the domains of gender as a social, cultural, and structural variable continue to exert influence on the delivery of oncology care. Although there have been vast advances in our understanding of the biological underpinnings of cancer and significant improvements in clinical care, disparities in cancer care for all women—including cisgender, transgender, and gender diverse women—persist. Similarly, despite inclusion within the oncology physician workforce, women and gender minorities, particularly those with additional identities under-represented in medicine, still face structural barriers to clinical and academic productivity and career success. In this article, we define and discuss how structural sexism influences both the equitable care of patients with cancer and the oncology workforce and explore the overlapping challenges in both realms. Solutions toward creating environments where patients with cancer of any gender receive optimal care and all physicians can thrive are put forward.

DEFINING STRUCTURAL SEXISM

Over the past 50 years, the availability of educational and employment opportunities for women has led toward societal advancement and gender equity.[1] Despite advances in the understanding and treatment of cancer, disparities persist across cancer care and the oncology workforce.[2] Structural sexism or systematic gender inequality in power and resources influence and perpetuate inequities for women within the health care system.[3] Defining certain terms surrounding structural sexism is essential to understand the concept. The terms sex and gender are often conflated but refer to distinct categories. Sex and gender are multidimensional constructs in which sex refers to anatomical and physiological traits (sex traits) and gender is a social construct on the basis of expressions and social and cultural expectations associated with sex.[4] As a social and structural variable, gender encompasses multiple domains beyond gender identity: gender roles, gender relations, and power.[4] Structural sexism can be measured at the macro, meso, and micro levels. The macro level refers to institutional sexism such as policies, cultural norms, and distributions of resources; the meso level refers to patterns of behavior and organizational practices; and the micro or individual level refers to the gendered perception of self.[3]

Both patient care and physicians' careers are negatively affected by structural sexism (Fig 1). Exposure to sexism at multiple levels is associated with more chronic conditions, worse self-rated health, and worse physical functioning for women.[3] A supportive workplace environment for physicians who are women is critical for women's health equity, in part because clinicians who are women are more likely to provide health care to women.[5] Despite the inclusion of women in medicine for over a generation, gender equity has been slow to materialize. Nearly half of women medical students report experiences of sexual harassment during medical school, rates substantially higher than in other STEMM graduate programs.[6] Progress in the rate of advancement of women into higher levels of faculty rank, department chairs, and cancer center directors has been limited.[7,8] Physicians who are women start with lower salaries than their counterparts who are men, and the gender wage gap continues to widen even when adjusted for factors such as rank and experience.[9,10] Differences in the work environment, leadership opportunities, and the accumulation of wealth are associated with decreased career satisfaction and higher rates of burnout for women oncologists.[11,12]

Structural sexism cannot be addressed without consideration of other forms of structural systems of discrimination and inequity that also affect patients with cancer and oncologists. Intersectionality is a framework for understanding how multiple socially constructed identity categories (ie, race, ethnicity, and gender) overlap and interact at the individual and institutional level to create disparate outcomes for

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PRACTICAL APPLICATIONS

- Structural sexism, the unequal distribution of resources and power, remains a challenge in oncology and negatively affects both physicians and patients.
- Structural sexism results in the deprioritization of specialties predominately populated by women physicians and patients and stalled progress in cancers affecting women.
- Policy and institutional solutions are needed to combat structural sexism and improve cancer care for all.

individuals and communities.[13] Structural sexism amplifies other institutional barriers such as structural racism, ableism, heterosexism, and classism, and individuals with multiple marginalized identities may be more affected by these compounding systematic forces.[14] Women who belong to groups that are under-represented in medicine face further structural challenges in addition to structural sexism; for example, Black and Latinx/Hispanic women are vastly under-represented in the specialties of medical, surgical, and radiation oncology.[15,16] This further affects patient care as diverse clinical teams are associated with increased patient satisfaction and perceived quality of care.[17,18]

Interpersonal factors that act as barriers to gender equity have been described extensively elsewhere.[19,20] To date, attempts to address the interpersonal sources of inequities have been insufficient.[21] Although implicit bias training can increase bias awareness,[22,23] reports on long-term successes of bias training are scant.[24,25] Rather than putting the onus on those affected by sexism to fix themselves, combatting structural sexism in cancer care demands the generation of specific structural solutions to foster equity related to the delivery of cancer care.

HOW CONSIDERATIONS OF SEX AND GENDER INFLUENCE CANCER CARE

Cancer incidence and outcomes are influenced by a variety of biologic, social, environmental, and economic conditions, including sex and gender.[26] The differences in cancer diagnosis and outcomes between men and women are multifactorial and poorly understood, but most likely reflect differences in both endogenous factors and exogenous factors. Both sex, as a biological variable, and gender, as a social, cultural, and structural variable, act to influence health. Historically, a 70-kg male patient was used to define

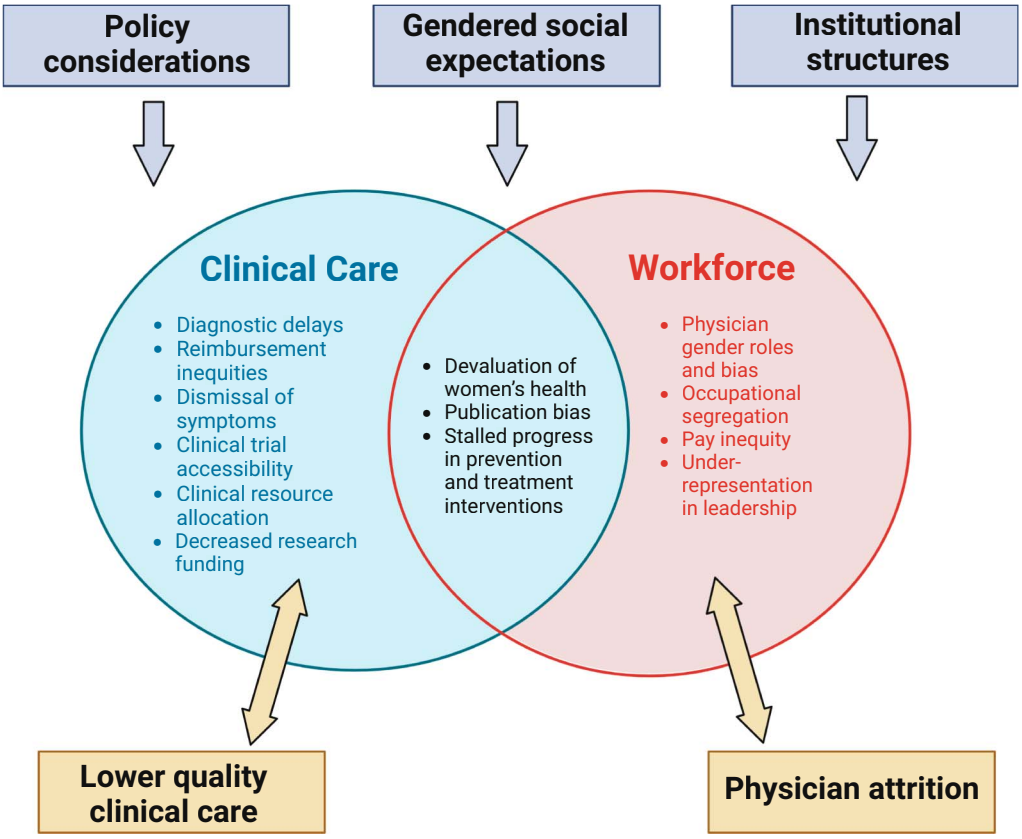

FIG 1. Structural sexism affects both oncology workforce and clinical care. Top arrows demonstrate the forces contributing to structural sexism in clinical care, physician workforce, and both domains; bidirectional arrows show the downstream outcomes which further amplify structural sexism. Created with Biorender.

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the average patient in medicinal education, practice, and biomedical research.[27] Both sex and gender, therefore, influence the structure of cancer care delivery, affecting how patients receive care.

Among the components that define sex, anatomy most noticeably influences epidemiologic differences in cancer risk, treatment, and outcomes (Fig 2). Cancer incidence and mortality (male:female ratio of 1.15 and 1.37, respectively) are higher in the male US population, reflecting differences in life expectancy and sex-specific cancer disease site risk.[28] Variations in incidence and mortality by sex additionally exist across disease sites that are not sex-specific. Higher cancer risk in male patients for most cancer sites except thyroid and gallbladder persists even after adjustment for known risk factors.[28-30]

Beyond anatomy, other domains of sex exert influence across cancer biology and clinical care. Sex differences in molecular and genomic alterations have been described across cancer disease sites in specific genes, including actionable mutations, such as mismatch repair genes, and mutation signatures.[31,32] Gonadal steroid hormones alter cancer risk and outcomes, and hormonal modulation is a common component of cancer therapy.[33] Although the influence of circulating estrogen, progesterone, and androgens is primarily implicated in cancers of reproductive organs, these hormones influence tumor vasculature, stroma, and other aspects of the tumor microenvironment.[34,35] Total body water, lipid composition, and metabolism influence the pharmacodynamics and pharmacokinetics of chemotherapy agents, potentially altering efficacy and adverse events.[36,37] Differences in the male and female innate and adaptive immune responses have been well-established.[38] Distinct sex-specific immune features across multiple cancer types and differences in response and adverse events with immuno-oncology treatments have been demonstrated.[33,37,39,40] The reduction of risk of death was twice as large for male patients compared with female patients according to a meta-analysis that pooled results from 20 randomized trials of immune checkpoint inhibitors.[40]

The multiple dimensions of gender similarly influence cancer care and affect patients with cancer. Gender identity and a sense of femininity link postmastectomy breast reconstruction to an improved quality of life.[41] Cultural expectations about behavior as they are associated with certain sex traits influence cancer risk behaviors (eg, indoor tanning, cigarette smoking, and physical inactivity). Conformation to gender norms of masculinity or femininity related to these behaviors contributes to cancer incidence

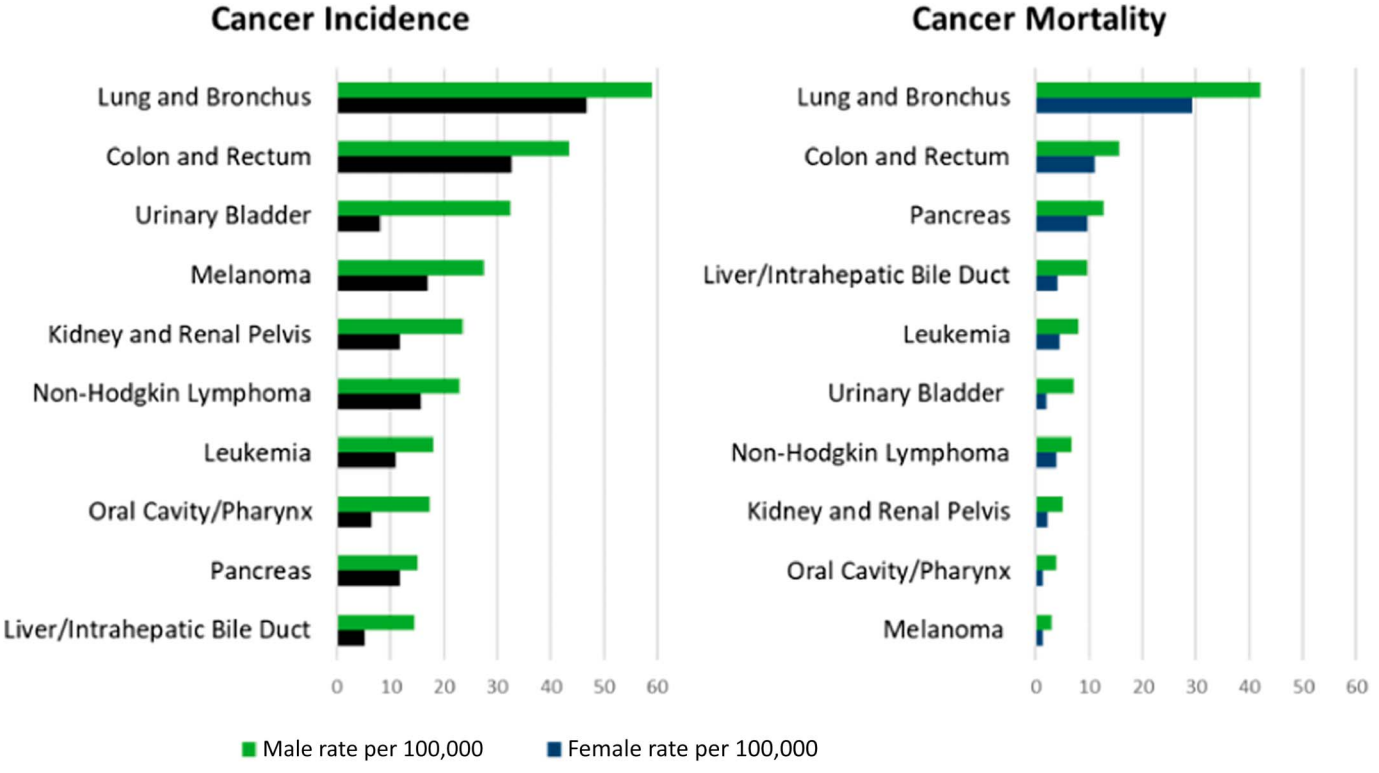

FIG 2. Age-adjusted cancer incidence and mortality rates in the United States including the years 2016-2020. Bars represent incidence and mortality rates for 100,000 male patients (green) or 100,000 female patients (blue) for the indicated cancer type. Created by SEER*Explorer.

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differences between men and women.[42] Gendered assumptions that women are emotional, sensitive, and even hysterical affect the way that physical pain symptoms are interpreted by health care professionals.[43] Gender bias in the patient encounters within the health care system can lead to diagnostic delays and is significantly associated with longer diagnostics intervals in six of 11 non–sex-specific disease sites (bladder, colorectal, gastric, head and neck, lung, and lymphoma) without comparable diagnostic delays for men in any of those disease sites.[44] Repeated exposures to gender-based inequities at the individual, relational, and institutional levels accumulate and are associated with a diagnosis of chronic conditions and worse overall health.[3] The presence of comorbidities and decreased performance status are well-known factors which are negatively associated with cancer outcomes.

Access to cancer care and the patient experience differ for women compared with men. Women are more likely to have health insurance than men but less willing to incur out-of-pocket costs influencing their availability and choices in therapies.[45] Financial toxicity perpetuates health disparities in access and quality cancer treatment.[46] Although women with cancer are more likely to have a caregiver than men, caregivers to male patients are more likely to be a spouse, whereas caregivers to female patients are more likely to be a child.[47] Psychosocial support from the health care team is valued more by women than men.[48]

Gender additionally influences how we think about sex and sex-specific conditions and disorders. Stigma contributes to nonadherence with breast and cervical cancer screening for persons from sexual and gender minority communities.[49] Dismissal of symptoms of postmenopausal bleeding by health care professionals is commonly reported by women ultimately diagnosed with endometrial cancer.[50] Ovarian cancer has been historically labeled a silent killer, although nearly three fourths of patients have documented symptoms in the year before their diagnosis.[51] The care of gynecologic cancers has historically been siloed from the care of other disease sites, leaving significant infrastructure barriers to care for patients with these malignancies.[52,53]

Sex and gender may act independently of each other and in ways that can complement, enhance, diminish, or negate the other's influence on cancer risk, treatment, and outcomes.[54] Similarly, sex and gender may interact with other social factors, such as race, ethnicity, socioeconomic status, and educational attainment to affect cancer outcomes.[55] The influence of structural determinants of health, including health insurance status, geographic distance from specialty care, and transportation barriers, generally disadvantage patients with cancer from under-represented and underserved communities.[3] Presumably resulting from the intersection of multiple social and structural factors, cervical and endometrial cancer, two female-specific disease sites, have among the largest racial disparities for Black women of solid tumor types.[56] Patients with gender nonconforming identities have been shown to have lower rates of cancer screening and increased cancer mortality.[57,58]

Within the scientific literature and health policy domains, sex and gender are often used imprecisely in language and/or conflated. A recent analysis of oncology trials between 2012 and 2019 used to support FDA drug approval demonstrated that sex and gender terminologies were used inconsistently in 76% of reporting of results. None of the 128 evaluated studies described how sex and gender information was collected or assessed. Although 89% of survival data for non–sex-specific cancer sites was disaggregated by sex, no study presented disaggregated toxicity data by sex or gender.[59] Without disaggregation by sex and gender of research data, an analysis and understanding of how sex differences and gender inequalities affect health is not possible. Inattention to sex and gender in research, imprecision in language and reporting, and inadequate enforcement of journal and funder policies reflect a larger system of gender inequity that devalues women's bodies, health, and experiences.

Gender inequity is also reflected in disparities in National Institutes of Health (NIH) funding for diseases that affect women. For many diseases that affect primarily one sex, the funding pattern favors those that primarily affect men. With respect to burden of the disease within the population, female-dominant diseases are statistically more likely to be underfunded compared with male-dominant diseases.[60,61] Although there is an association between burden of disease and NIH funding, historic funding for a condition or disease is the factor most strongly associated with continued funding, thereby perpetuating male bias in biomedical research.[62] Disproportionately low NIH funding to gynecologic cancers compared with other cancer disease sites has been described.[60,63,64] Over time, persistent disparities in funding and research resources can lead to gaps in the evidence base for screening, diagnosis, and treatment of female-specific cancers, as well as limiting the pipeline of researchers invested identifying novel therapeutics for those diseases.

Reproducibility and generalizability of cancer clinical trials depend on the enrollment of populations representative of the population for which interventions are intended. Historically, exclusion of women from clinical trials rested on the gendered construction of a normal study participant as a 70-kg male patient, concerns that the normal hormonal fluctuations of the menstrual cycles might interfere with study results, and fears that enrollment of subjects capable of pregnancy might potentially lead to a teratogenic fetal exposure. The requirement that NIH-funded researchers

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enroll racial and ethnic minorities and women, including women of childbearing age, into clinical research trials was codified into Federal law in the NIH Revitalization Act of 1993.[65] Although women make up approximately half of participants in NIH-sponsored research today, disparities in cancer clinical trial enrollment persist. For non–sex-specific trials completed between 2003 and 2016, female patients were underenrolled. Female enrollment to lung and pancreatic cancer trials was under 10% during this time frame while they represent over 40% of the new diagnoses.[66]

Oncology drug development depends on phase I trials made up of small cohorts of patients receiving escalating doses. In a recent analysis of National Cancer Institute (NCI)–supported phase I trials (between 2000 and 2019), similar numbers of male and female participants were enrolled and outcomes, including survival and adverse events, were similar between men and women. However, there are multiple selection biases in clinical trials enrollment that favor male participation in all phases of drug development.[67] Women are more likely than men to have multiple chronic conditions[68]; hemoglobin levels are generally lower in women, which could potentially preclude women from participation[69]; and financial toxicity related to clinical trials enrollment may disproportionately affect women's accrual.[70] Without representative populations of women participating in clinical research, the applicability of doses and efficacy of anticancer agents to the broader population of women may result in over- or undertreatment as well as excess treatment-related toxicity.

Few peer-reviewed journals are centered around the health needs of women. Publications in women's health journals remain primarily focused on reproductive health with an emphasis on obstetrics.[71] Within the broader publication community, women's health research has been shown to be less publishable—and when published, less impactful—than research focused on men.[72] Research focused on cancer care for women is also more often performed by women than men adding to other publication biases.

THE IMPACT OF STRUCTURAL SEXISM ON THE ONCOLOGY WORKFORCE

Just as the intersection of gender, power, and status affects patient care, structural sexism has wide-ranging effects on the oncology workforce. The physician identity was created by men as medicine was historically a profession performed by men.[73] The culture of medicine today reflects this history with value assigned to typically masculine traits and characteristics such as authority, objectivity, and rationality. More characteristically feminine behaviors such as acts of compassion or bidirectional communication are infrequently built into health care systems, incentivized, or rewarded.[73] The consideration of sex and gender as a binary has resulted in unique challenges, such as emotional distress, harassment, and fear, for physicians with nonconforming gender identities.[74,75] In 2021, 35.2% of practicing oncologists identified as women.[19] Yet despite large numbers of women practicing in oncology-focused specialties, women in oncology face many of the same challenges encountered by women in the larger medical community.

Gender bias or assumptions about roles, behaviors, and interactions on the basis of presumed sex are pervasive in society and medicine. Gender-biased beliefs are equally held by men and women,[76] health care professionals, and the general public.[77] Resulting from these wider societal expectations, women practicing medicine juggle a disproportionate share of household management and childcare tasks compared with their male colleagues in addition to their work as physicians.[78] Occupational gender bias, including the association of men as physicians, is identified early in childhood.[79] Gender segregation in medicine occurs at the specialty level with women tending to choose communal specialties that involve the care of women and children.[23] The specialties with the largest representation of women in the oncology workforce reflect this gendered specialty divide as 54% of gynecologic oncologists and 69% of breast surgeons are women.[80-82]

The culture of medicine—a hierarchical power structure, history of male dominance, long hours, and ample access to private spaces—makes gender-based harassment in medicine more pervasive than in other science or professional fields.[6] While explicit discrimination and sexual harassment are declining, implicit gender bias remains prevalent and can have equivalently detrimental effects over time compared with explicit discrimination.[6,83] In a recent survey of ASCO members, 70% reported having experienced sexual harassment in the past year. These experiences were more common in women compared with men (80% *v* 56%) and included gender harassment, unwanted sexual attention, and sexual coercion.[84] Inclusion of women into a specialty does not necessarily lead to decreasing rates of gender harassment. Within general surgery residencies, increasing percentages of women correlates with higher rates of gender discrimination and sexual harassment.[85] Most gynecologic oncologists (64%) report workplace gender discrimination.[86] Behaviors of these volumes, reported from such a variety of sources that include authority figures, patients, staff, and other hospital employees, suggest social forces beyond the individual level that drive gender-based harassment.[87,88]

Role congruity theory when applied to gender and medicine proposes that women will be positively evaluated when they are perceived as feminine (not a physician); however, being perceived as a woman often leads to being unrecognized as

an expert. This double bind leaves women challenged as to whether they should prioritize likeability or recognition for their expertise.[81,89] Biases held by patients and coworkers lead to the frequent misidentification of physicians who are women as nurses, support staff, or other nonphysician health care professionals leaving women to choose between laughing it off or asserting their role.[90,91] Women are less likely than men to be introduced using professional titles in a variety of setting including while speaking at grand rounds[92] and when receiving messages from patients communicating through the electronic medical record.[93] Despite representing 35.6% of physician membership within oncology professional societies, women were found to receive only 24% of the physician awards suggesting exceptional performance may be less likely to be recognized or rewarded in women.[94] Each of these seeming small undermining acts, behaviors, or dismissals accumulate, create additional work for women who are physicians to justify their skill and proficiency, and contribute to the leadership gap in medicine.[95-97]

Leadership in oncology remains disproportionately male. Over half of women practicing oncology perceive their gender to adversely affect their job promotion.[98] Within academic medical departments in gynecology and radiation oncology, a disproportionately low number of women hold the rank of full professor or department chair.[99-101] Within radiation oncology, there remains an under-representation of women in chair positions despite higher levels of grant funding for women.[102] At NCI-designated cancer centers, cancer center leadership teams are made up of predominantly White men, with women holding only 16% of cancer center director positions.[8,100,103] Women remain underrepresented in the currency of academics—women are less likely than men to publish in the senior author position, less likely to be included in authorship of clinical trials, and less likely to hold editorial positions in oncology journals.[104,105] These and other opportunities and activities can be thought of as markers of influence.[106] They coalesce and synergize to define leadership in oncology, and if, for each marker, women are less likely to be considered or awarded, stereotypes about women being less fit for leadership are perpetuated.

Gender pay gaps, arguably the most objective and transparent representation of differing value assigned to work performed by women, persist in all fields of oncology.[80,107,108] Across professions, the separation of jobs as performed primarily by women or men, or occupational segregation, explains much of the gender wage gap.[109] Men and women earn less in professions predominated by women compared with those where men are in the majority. The declines typically occur after the entry of women into previously male-dominant occupations signifying a devaluing of the same work when performed by women.[110,111] This trend has been demonstrated in medical fields including endocrinology, surgery, and gynecology.[81,110,112]

Numerous other gender-related factors explain observed differences in salary. Our current approach to physician compensation approach devalues an approach to practice favored by women (whether due to patient and coworker expectations or gender identity as a woman)—engagement in more patient-centered care and longer visits.[113,114] Female-specific procedures reimburse on average 28% lower than the comparable procedure in a male patient, a so-called double discrimination for women physicians who primarily care for breast or gynecologic malignancies.[114,115] Compensation in specialty care is most often dependent on new patient referrals. Although doctors are more likely to refer to specialists of the same gender, a bias toward referrals to men persists even with increasing representation of women within a specialty.[116,117] Patient complications lead to sharp drops in referrals to specialists who are women (and all women physicians) but not to men.[118] Women are more likely to be referred patients with complex psychosocial problems who require more time in the office and are less likely to generate procedural revenue.[11] In aggregate, women are doing more work for each work unit assigned compared with men.

SURMOUNTING THE CHALLENGE OF STRUCTURAL SEXISM IN CANCER CARE

The multiple domains of gender amplify one another leading to many barriers for patients with cancer and the oncology workforce. The downstream effects of structural sexism negatively influence the quality of care and innovation in research and are evidenced by persistent disparities in outcomes for patients with cancer and the continued barriers to career satisfaction and advancement for all oncologists, who identify as women—including cisgender, transgender, and gender diverse women—despite several decades of inclusion. Women with additional underrepresented identities are further disadvantaged by the intersection of structural sexism with other structural factors that influence health.

To overcome the challenges related to structural sexism, organizational and structural changes are required. Several cancer research and care organizations, such as European Society for Medical Oncology and ASCO, have put forth leadership development initiatives for oncologists of all backgrounds, advocated for policies advancing health equity for patients with cancer, and put forth best practices for caring for gender minority patients with cancer.[15,26,119,120] The following solutions are put forward toward creating a more equitable work and supportive clinical environment for the betterment of oncologists and patients with cancer.

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- Individual oncologists should examine their own motivations, biases, and practices related to the delivery of equitable medical care to all patients.
  - Interventions to best implement and reward empathetic, trauma-informed (inclusive of recognizing and responding to the effects of traumatic stress and promoting patient safety, empowerment, and healing), and person-centered care are urgently needed across oncology care delivery environments.
- Incorporate sex and gender education in medical school, postgraduate oncology training, and continuing medical education such that the concepts are well understood by clinicians and the oncology workforce.
- Interrogate and disaggregate data from quality improvement projects by patient and health care professional gender to identify areas in need of improvement.
- Ensure inclusion of sex and gender considerations, diverse populations of researchers (including women), and patients throughout the research continuum—from hypothesis generation to study design, analysis, interpretation, and dissemination of results.
- Encourage the use of precise and accurate terminology about sex and gender in interpersonal communication, patient charts, reporting of research results, and health education related to cancer.
  - Avoid use of stigmatizing language (eg, hysterical, aggressive, and bossy) when discussing patients and colleagues and opt for gender-neutral terms when possible (eg, upset, assertive, and goal-directed).
- Enhance flexibility. Alternate schedules, job sharing, and family-friendly policies allow patients and health care professionals with any gender to better integrate cancer care with other responsibilities and ensure continuity of care.
- Enact term limits for leadership positions within organizations, professional societies, and journals. Term limits spur succession planning and innovation.
- Create cultures of inclusion and excellence, through ensuring transparent and fair metrics for patient care, administrative tasks, and research.
- Ensure transparent and fair metrics for recruitment, retention, promotion, and salary.

Equity is important to everyone, and diversity improves health care and research outcomes. Dismantling structural sexism is one piece of improving care delivery in cancer care, and the cancer research enterprise can benefit individuals of all genders and improves the health of communities of people affected by cancer.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST AND DATA AVAILABILITY STATEMENT

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REFERENCES

1. England P, Levine A, Mishel E: Progress toward gender equality in the United States has slowed or stalled. Proc Natl Acad Sci USA 117:6990-6997, 2020
2. Williams PA, Zaidi SK, Sengupta R: AACR cancer disparities progress report 2022. Cancer Epidemiol Biomarkers Prev 31:1249-1250, 2022
3. Homan P: Structural sexism and health in the United States: A new perspective on health inequality and the gender system. Am Sociologic Rev 84:486-516, 2019
4. Bates N, Chin M, Becker T, (eds): Measuring Sex, Gender Identity, and Sexual Orientation. Washington, DC, The National Academies Press, 2022
5. Coffman M, Wilkinson E, Jabbarpour Y: Despite adequate training, only half of family physicians provide Women's Health Care Services. J Am Board Fam Med 33:186-188, 2020

6. National Academies of Sciences, Engineering, and Medicine: Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine. Washington, DC, The National Academies Press, 2018
7. Richter KP, Clark L, Wick JA, et al: Women physicians and promotion in academic medicine. N Engl J Med 383:2148-2157, 2020
8. Lerman C, Hughes-Halbert C, Falcone M, et al: Leadership diversity and development in the Nation's Cancer Centers. J Natl Cancer Inst 114:1214-1221, 2022
9. Dandar VM, Lautenberger DM: Exploring Faculty Salary Equity at US Medical Schools by Gender and Race/ethnicity. Washington, DC, Association of American Medical Colleges, 2021
10. Catenaccio E, Rochlin JM, Simon HK: Addressing gender-based disparities in earning potential in academic medicine. JAMA Netw Open 5:e220067, 2022
11. McMurray JE, Linzer M, Konrad TR, et al: The work lives of women physicians results from the physician work life study. The SGIM Career Satisfaction Study Group. J Gen Intern Med 15:372-380, 2000
12. Shanafelt TD, Gradishar WJ, Kosty M, et al: Burnout and career satisfaction among US oncologists. J Clin Oncol 32:678-686, 2014
13. Bowleg L: The problem with the phrase women and minorities: Intersectionality—An important theoretical framework for public health. Am J Public Health 102:1267-1273, 2012
14. Homan P, Brown TH, King B: Structural intersectionality as a new direction for health disparities research. J Health Soc Behav 62:350-370, 2021
15. Winkfield KM, Levit LA, Tibbits M, et al: Addressing equity, diversity, and inclusion of Black physicians in the oncology workforce. JCO Oncol Pract 17:224-226, 2021
16. Duma N, Velazquez AI, Franco I, et al: Donde Estan? Latinx/Hispanic representation in the oncology workforce: Present and future. JCO Oncol Pract 18:388-395, 2022
17. Takeshita J, Wang S, Loren AW, et al: Association of racial/ethnic and gender concordance between patients and physicians with patient experience ratings. JAMA Netw Open 3:e2024583, 2020
18. Saha S, Komaromy M, Koepsell TD, et al: Patient-physician racial concordance and the perceived quality and use of health care. Arch Intern Med 159:997-1004, 1999
19. Velazquez AI, Gilligan TD, Kiel LL, et al: Microaggressions, bias, and equity in the workplace: Why does it matter, and what can oncologists do? Am Soc Clin Oncol Educ Book 42:1-12, 2022
20. Torres MB, Salles A, Cochran A: Recognizing and reacting to microaggressions in medicine and surgery. JAMA Surg 154:868-872, 2019
21. Fox C: Stop Fixing Women: Why Building Fairer Workplaces Is Everyone's Business. Sydney, Australia, NewSouth Publishing, 2017
22. Sabin J, Guenther G, Ornelas IJ, et al: Brief online implicit bias education increases bias awareness among clinical teaching faculty. Med Educ Online 27:2025307, 2022
23. Carnes M, Bartels CM, Kaatz A, et al: Why is John more likely to become department chair than Jennifer? Trans Am Clin Climatol Assoc 126:197-214, 2015
24. Maina IW, Belton TD, Ginzberg S, et al: A decade of studying implicit racial/ethnic bias in healthcare providers using the implicit association test. Soc Sci Med 199:219-229, 2018
25. Pritlove C, Juando-Prats C, Ala-leppilampi K, et al: The good, the bad, and the ugly of implicit bias. Lancet 393:502-504, 2019
26. Patel MI, Lopez AM, Blackstock W, et al: Cancer disparities and health equity: A policy statement from the American Society of Clinical Oncology. J Clin Oncol 38:3439-3448, 2020
27. Lowey NM: Women's health and medical school curricula. Acad Med 69:280-281, 1994
28. Siegel RL, Miller KD, Fuchs HE, et al: Cancer statistics, 2022. CA Cancer J Clin 72:7-33, 2022
29. Zhu Y, Shao X, Wang X, et al: Sex disparities in cancer. Cancer Lett 466:35-38, 2019
30. Edgren G, Liang L, Adami HO, et al: Enigmatic sex disparities in cancer incidence. Eur J Epidemiol 27:187-196, 2012
31. Li CH, Prokopec SD, Sun RX, et al: Sex differences in oncogenic mutational processes. Nat Commun 11:4330, 2020
32. Li CH, Haider S, Shiah YJ, et al: Sex differences in cancer driver genes and biomarkers. Cancer Res 78:5527-5537, 2018
33. Rubin JB, Lagas JS, Broestl L, et al: Sex differences in cancer mechanisms. Biol Sex Differ 11:17, 2020
34. Clocchiatti A, Cora E, Zhang Y, et al: Sexual dimorphism in cancer. Nat Rev Cancer 16:330-339, 2016
35. Wuidar V, Gillot L, Da Silva ID, et al: Sex-based differences in the tumor microenvironment. Adv Exp Med Biol 1329:499-533, 2021
36. Wagner AD: Sex differences in cancer chemotherapy effects, and why we need to reconsider BSA-based dosing of chemotherapy. ESMO Open 5:e000770, 2020
37. Unger JM, Vaidya R, Albain KS, et al: Sex differences in risk of severe adverse events in patients receiving immunotherapy, targeted therapy, or chemotherapy in cancer clinical trials. J Clin Oncol 40:1474-1486, 2022
38. Klein SL, Flanagan KL: Sex differences in immune responses. Nat Rev Immunol 16:626-638, 2016
39. Ye Y, Jing Y, Li L, et al: Sex-associated molecular differences for cancer immunotherapy. Nat Commun 11:1779, 2020
40. Conforti F, Pala L, Bagnardi V, et al: Cancer immunotherapy efficacy and patients' sex: A systematic review and meta-analysis. Lancet Oncol 19:737-746, 2018
41. Hart AM, Pinell-White X, Losken A: The psychosexual impact of postmastectomy breast reconstruction. Ann Plast Surg 77:517-522, 2016

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42. Roberts AL, Rosario M, Calzo JP, et al: Masculine boys, feminine girls, and cancer risk behaviors: An 11-year longitudinal study. J Adolesc Health 55:373-379, 2014
43. Samulowitz A, Gremyr I, Eriksson E, et al: "Brave men" and "emotional women": A theory-guided literature review on gender bias in health care and gendered norms towards patients with chronic pain. Pain Res Manag 2018:6358624, 2018
44. Din NU, Ukoumunne OC, Rubin G, et al: Age and gender variations in cancer diagnostic intervals in 15 cancers: Analysis of data from the UK clinical practice research datalink. PLoS One 10:e0127717, 2015
45. Ranji UR, RosenzweigC, Salganicoff A: Women's Coverage, Access, and Affordability: Key Findings From the 2017 Kaiser Women's Health Survey. Menlo Park, CA, Henry J. Kaiser Family Foundation, 2018
46. Shah K, Zafar SY, Chino F: Role of financial toxicity in perpetuating health disparities. Trends Cancer 8:266-268, 2022
47. Borsky AE, Zuvekas SH, Kent EE, et al: Understanding the characteristics of US cancer survivors with informal caregivers. Cancer 127:2752-2761, 2021
48. Wessels H, Graeff A, Wynia K, et al: Gender-related needs and preferences in cancer care indicate the need for an individualized approach to cancer patients. Oncologist 15:648-655, 2010
49. Milner GE, McNally RJ: Nonadherence to breast and cervical cancer screening among sexual minority women: Do stigma-related psychological barriers play a role? Health Psychol 39:891-899, 2020
50. Doll KM, Nguyen A, Alson JG: A conceptual model of vulnerability to care delay among women at risk for endometrial cancer. Gynecol Oncol 164:318-324, 2022
51. Huepenbecker SP, Sun CC, Fu S, et al: Factors impacting the time to ovarian cancer diagnosis based on classic symptom presentation in the United States. Cancer 127:4151-4160, 2021
52. Temkin SM: Personal reflections on gynecologic oncology and its future. Obstet Gynecol 133:1255-1258, 2019
53. Temkin SM, Smeltzer MP, Dawkins MD, et al: Improving the quality of care for patients with advanced epithelial ovarian cancer: Program components, implementation barriers, and recommendations. Cancer 128:654-664, 2022
54. Krieger N: Genders, sexes, and health: What are the connections—and why does it matter? Int J Epidemiol 32:652-657, 2003
55. Islami F, Guerra CE, Minihan A, et al: American Cancer Society's report on the status of cancer disparities in the United States, 2021. CA Cancer J Clin 72:112-143, 2022
56. DeSantis CE, Miller KD, Goding Sauer A, et al: Cancer statistics for African Americans, 2019. CA Cancer J Clin 69:211-233, 2019
57. Leone AG, Trapani D, Schabath MB, et al: Cancer in transgender and gender-diverse persons: A review. JAMA Oncol 10.1001/jamaoncol.2022.7173 [epub ahead of print on February 9, 2023]
58. Jackson SS, Han X, Mao Z, et al: Cancer stage, treatment, and survival among transgender patients in the United States. J Natl Cancer Inst 113:1221-1227, 2021
59. Hall M, Krishnanandan VA, Cheung MC, et al: An evaluation of sex- and gender-based analyses in oncology clinical trials. J Natl Cancer Inst 114:1186-1191, 2022
60. Mirin AA: Gender disparity in the funding of diseases by the U.S. National Institutes of Health. J Womens Health 30:956-963, 2021
61. National Cancer Institute: Funding for Research Areas. https://www.cancer.gov/about-nci/budget/fact-book/data/research-funding
62. Ballreich JM, Gross CP, Powe NR, et al: Allocation of National Institutes of Health funding by disease category in 2008 and 2019. JAMA Netw Open 4:e2034890, 2021
63. Spencer RJ, Rice LW, Ye C, et al: Disparities in the allocation of research funding to gynecologic cancers by Funding to Lethality scores. Gynecol Oncol 152:106-111, 2019
64. Spencer R, Rice LW, Uppal S: Using the National Comprehensive Cancer Network guidelines and levels of evidence to prioritize research focus in gynecologic cancer care. Gynecol Oncol 145:35, 2017
65. US Congress: National Institutes of Health Revitalization Act of 1993: Act to Amend the Public Health Service Act to Revise and Extend the Programs of the National Institutes of Health, and for Other Purposes. Public Law. Washington, DC, U.S. Government Publishing Office, 1993
66. Duma N, Vera Aguilera J, Paludo J, et al: Representation of minorities and women in oncology clinical trials: Review of the past 14 years. J Oncol Pract 14:e1-e10, 2018
67. Chihara D, Lin R, Flowers CR, et al: Early drug development in solid tumours: Analysis of National Cancer Institute-sponsored phase 1 trials. Lancet 400:512-521, 2022
68. Fabbri E, Zoli M, Gonzalez-Freire M, et al: Aging and multimorbidity: New tasks, priorities, and frontiers for integrated gerontological and clinical research. J Am Med Dir Assoc 16:640-647, 2015
69. Adeli K, Raizman JE, Chen Y, et al: Complex biological profile of hematologic markers across pediatric, adult, and geriatric ages: Establishment of robust pediatric and adult reference intervals on the basis of the Canadian Health Measures Survey. Clin Chem 61:1075-1086, 2015
70. Huey RW, George GC, Phillips P, et al: Patient-reported out-of-pocket costs and financial toxicity during early-phase oncology clinical trials. Oncologist 26:588-596, 2021
71. Hallam L, Vassallo A, Pinho-Gomes AC, et al: Does journal content in the field of women's health represent women's burden of disease? A review of publications in 2010 and 2020. J Womens Health 31:611-619, 2022

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72. Murrar S, Johnson PA, Lee YG, et al: Research conducted in women was deemed more impactful but less publishable than the same research conducted in men. J Womens Health (Larchmt) 30:1259-1267, 2021
73. Lombarts KMJ, Verghese A: Medicine is not gender-neutral—She is male. N Engl J Med 386:1284-1287, 2022
74. Westafer LM, Freiermuth CE, Lall MD, et al: Experiences of transgender and gender expansive physicians. JAMA Netw Open 5:e2219791, 2022
75. Eliason MJ, Dibble SL, Robertson PA: Lesbian, gay, bisexual, and transgender (LGBT) physicians' experiences in the workplace. J Homosex 58:1355-1371, 2011
76. Filut A, Kaatz A, Carnes M: The Impact of Unconscious Bias on Women's Career Advancement. Tokyo, Japan, The Sasakawa Peace Foundation, 2017
77. Salles A, Awad M, Goldin L, et al: Estimating implicit and explicit gender bias among health care professionals and surgeons. JAMA Netw Open 2:e196545, 2019
78. Johnson HM, Irish W, Strassle PD, et al: Associations between career satisfaction, personal life factors, and work-life integration practices among US surgeons by gender. JAMA Surg 155:742-750, 2020
79. Wilbourn MP, Kee DW: Henry the nurse is a doctor too: Implicitly examining children's gender stereotypes for male and female occupational roles. Sex Roles 62:670-683, 2010
80. Temkin SM, Chapman-Davis E, Nair N, et al: Creating work environments where people of all genders in gynecologic oncology can thrive: An SGO evidence-based review. Gynecol Oncol 164:473-480, 2022
81. Greenberg CC: Association for academic surgery presidential address: Sticky floors and glass ceilings. J Surg Res 219:ix-xviii, 2017
82. Radford DM, Parangi S, Tu C, et al: h-Index and academic rank by gender among breast surgery fellowship faculty. J Womens Health (Larchmt) 31:110-116, 2022
83. Jones KP, Sabat IE, King EB, et al: Isms and schisms: A meta-analysis of the prejudice-discrimination relationship across racism, sexism, and ageism. J Organiz Behav 38:1076-1110, 2017
84. Subbiah IM, Markham MJ, Graff SL, et al: Incidence, nature, and consequences of oncologists' experiences with sexual harassment. J Clin Oncol 40:1186-1195, 2022
85. Schlick CJR, Ellis RJ, Etkin CD, et al: Experiences of gender discrimination and sexual harassment among residents in general surgery programs across the US. JAMA Surg 156:942-952, 2021
86. Stasenko M, Tarney C, Seier K, et al: Sexual harassment and gender discrimination in gynecologic oncology. Gynecol Oncol 159:317-321, 2020
87. Hong LJ, Rubinsak L, Benoit MF, et al: Gynecologic oncology and inclusion of women into the surgical workforce: The canary in this coal mine. Front Oncol 12:789910, 2022
88. Dossett LA, Vitous CA, Lindquist K, et al: Women surgeons' experiences of interprofessional workplace conflict. JAMA Netw Open 3:e2019843, 2020
89. Eagly AH, Karau SJ: Role congruity theory of prejudice toward female leaders. Psychol Rev 109:573-598, 2002
90. Arora V, Gangireddy S, Mehrotra A, et al: Ability of hospitalized patients to identify their in-hospital physicians. Arch Intern Med 169:199-201, 2009
91. Kaye EC: Misogyny in medicine. N Engl J Med 384:2267-2269, 2021
92. Files JA, Mayer AP, Ko MG, et al: Speaker introductions at internal medicine grand rounds: Forms of address reveal gender bias. J Womens Health (Larchmt) 26:413-419, 2017
93. Santhosh L, Witt L: Jane (or Dr Doe?) will reply to your patient portal message now. JAMA Netw Open 5:e2234883, 2022
94. Patel SR, St. Pierre F, Velazquez AI, et al: The matilda effect: Underrecognition of women in hematology and oncology awards. Oncologist 26:779-786, 2021
95. Cardador MT, Hill PL, Salles A: Unpacking the status-leveling burden for women in male-dominated occupations. Administrative Sci Q 67:237-284, 2022
96. Lewiss RE, Silver JK, Bernstein CA, et al: Is academic medicine making mid-career women physicians invisible? J Womens Health 29:187-192, 2020
97. Kaatz A, Carnes M: Stuck in the out-group: Jennifer can't grow up, Jane's invisible, and Janet's over the hill. J Womens Health 23:481-484, 2014
98. Merfeld EC, Blitzer GC, Kuczmarska-Haas A, et al: Women oncologists' perceptions and factors associated with decisions to pursue academic vs nonacademic careers in oncology. JAMA Netw Open 4:e2141344, 2021
99. Chowdhary M, Chowdhary A, Royce TJ, et al: Women's representation in leadership positions in academic medical oncology, radiation oncology, and surgical oncology programs. JAMA Netw Open 3:e200708, 2020
100. Temkin SM, Rubinsak L, Benoit MF, et al: Take me to your leader: Reporting structures and equity in academic gynecologic oncology. Gynecol Oncol 157:759-764, 2020
101. Odei B, Kahn J, Holliday EB, et al: Where are the women in radiation oncology? A cross-sectional multi-specialty comparative analysis. Adv Radiat Oncol 6:100735, 2021
102. Beeler WH, Griffith KA, Jones RD, et al: Gender, professional experiences, and personal characteristics of academic radiation oncology chairs: Data to inform the pipeline for the 21st century. Int J Radiat Oncol Biol Phys 104:979-986, 2019
103. Morgan A, Shah K, Tran K, et al: Racial, ethnic, and gender representation in leadership positions at National Cancer Institute–designated cancer centers. JAMA Netw Open 4:e2112807, 2021
104. Yalamanchali A, Zhang ES, Jagsi R: Trends in female authorship in major journals of 3 oncology disciplines, 2002-2018. JAMA Netw Open 4:e212252, 2021
105. Dai N, Li J, Ren L, et al: Gender representation on editorial boards of leading oncology journals. ESMO Open 7:100590, 2022

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106. Shroff RT, Goodman KA, Mehnert JM, et al: Where are all the women in industry advisory boards? J Clin Oncol 41:1659-1663, 2023

107. AAMC Faculty Salary Report FY 2022. https://store.aamc.org/aamc-faculty-salary-report-fy-2022-online.html

108. Guss ZD, Chen Q, Hu C, et al: Differences in physician compensation between men and women at United States public academic radiation oncology departments. Int J Radiat Oncol Biol Phys 103:314-319, 2019

109. Hegewisch A, Hartmann H: Occupational segregation and the gender wage gap: A job half done. Washington, DC, Institute for Women's Policy Research (IWPR) 2014

110. Pelley E, Carnes M: When a specialty becomes "women's work": Trends in and implications of specialty gender segregation in medicine. Acad Med 95:1499-1506, 2020

111. Pan J: Gender segregation in occupations: The role of tipping and social interactions. J Labor Econ 33:365-408, 2015

112. Pelley E, Danoff A, Cooper DS, et al: Female physicians and the future of endocrinology. J Clin Endocrinol Metab 101:16-22, 2016

113. Chen YW, Westfal ML, Chang DC, et al: Underemployment of female surgeons? Ann Surg 273:197-201, 2021

114. Benoit MF, Ma JF, Upperman B: Comparison of 2015 Medicare relative value units for gender-specific procedures: Gynecologic and gynecologic-oncologic versus urologic CPT coding. Has time healed gender-worth? Gynecol Oncol 144:336-342, 2017

115. Watson KL, King LP: Double discrimination, the pay gap in gynecologic surgery, and its association with quality of care. Obstet Gynecol 137:657-661, 2021

116. Zeltzer D: Gender homophily in referral networks: Consequences for the medicare physician earnings gap. Am Econ J Appl Econ 12:169-197, 2020

117. Dossa F, Zeltzer D, Sutradhar R, et al: Sex differences in the pattern of patient referrals to male and female surgeons. JAMA Surg 157:95-103, 2022

118. Sarsons H: Interpreting Signals in the Labour Market: Evidence from Medical Referrals. Cambridge, MA, Harvard University, 2017

119. Griggs J, Maingi S, Blinder V, et al: American Society of Clinical Oncology position statement: Strategies for reducing cancer health disparities among sexual and gender minority populations. J Clin Oncol 35:2203-2208, 2017

120. Linardou H, Adjei A, Bajpai J, et al: Challenges in oncology career: Are we closing the gender gap? Results of the new ESMO Women for Oncology Committee survey. ESMO Open 8:100781, 2023

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