Clinical research in the community

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Most patients with high-risk hematologic malignancies are treated in community oncology practices near their residence. This is partly due to patients' ardent desire to be closer to home and trust in local caregivers. Treatments are increasingly complex, even as initial therapy, and more so upon relapse. Improved outcomes in the past decade are largely available through clinical trials primarily offered through academic medical centers. Limited availability of clinical trials at community oncology practices is a major contributor to outcome disparities among minorities, rural, and elderly patients, all of whom are underrepresented in clinical trials. Between 2003 and 2023, the National Cancer Institute (NCI) established programs to address these challenges: the Community Clinical Oncology Program, Minority-Based Community Clinical Oncology Program, NCI Community Cancer Centers Program, and NCI Community Oncology Research Program. However, disparities have persisted, particularly for pharmaceutical-directed clinical research. Lack of representation in clinical research results in data absenteeism, data chauvinism and hallucination, and a delay in treatment availability for high-risk hematologic malignancies in community practice. To address this, the US Congress enacted the Food and Drug Administration Omnibus Act in 2022 to help establish diversity plans that would broaden clinical trial patient enrollment in the United States. We recommend using these initiatives in community oncology practices, including the adoption of the DRIVE strategy in collaboration with pharmaceutical companies, as well as using the NCI-established programs to promote clinical trial availability for patients with high-risk malignancies treated in community oncology practices.

LEARNING OBJECTIVES

- Evaluate opportunities and challenges in clinical trials for patients with hematologic malignancies treated in community oncology practices
- Identify, use, and apply effective strategies to improve availability and enrollment in clinical trials in community oncology practices
- Apply governmental and nongovernmental processes to improve access to clinical trials, health care outcomes and research disparities

CLINICAL CASE

A 54-year-old African American man who lives with and cares for his elderly mother presents with generalized lymphadenopathy, weight loss, and night sweats. Diagnostic lymph node biopsy is pathologically consistent with germinal center diffuse large-cell lymphoma (DLBCL) without mutations or gene rearrangements of BCL-2, BCL-6, or MYC. Upon staging, he was determined to be stage IVB. His Eastern Cooperative Oncology Group performance status was 1, and his age-adjusted International Prognostic Index (IPI) was 3, with an estimated poor survival of 30 months.[1] He was offered participation in an ongoing phase 3 randomized clinical trial of polatuzumab, rituximab, cyclophosphamide, doxorubicin, and prednisone (Pola-R-CHP) versus rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP) by his community oncologist but declined due to a required 30-mile travel to an academic center, his caregiver responsibilities, and a desire to be treated by his well-trusted local care team. He then received 6 cycles of R-CHOP and achieved complete remission. Nine months later, he relapsed. He is interested in aggressive therapies but wants to remain in the care of his community oncologist.

Opportunities and challenges to clinical research for high-risk hematologic malignancies in community oncology

Availability of clinical trials in community oncology practice

The most common high-risk hematologic malignancies typically requiring intense and complicated therapies are acute leukemias, multiple myeloma (MM), and lymphomas, with approximately 150 000 patients diagnosed annually in the United States,[2,3] most of whom are treated at centers within 5 miles of their residence through their community medical oncologist.[4] However, clinical cancer trials have traditionally been conducted at academic medical centers, while 80% to 85% of cancer patients are treated at community-based clinical practices.[5,6] The current workforce of community medical oncology comprises highly trained physicians with substantial experience and expertise in clinical research, but most do not have access to clinical trials of new and emerging therapies for high-risk hematologic malignancies. Therefore, community-based cancer research is critical in advancing cancer care for the large, diverse patient population receiving treatment in various local health care delivery settings. In addition, the participation of community oncologists and primary care physicians in cancer prevention, control, and treatment trials significantly facilitates the translation of research advances into practice.[7] Most clinical trial enrollees receive their treatment at academic centers, but community oncologists enroll more patients into cooperative trials sponsored by the National Cancer Institute (NCI), with about 65 percent of these patients entering from community-based practices.[8]

Challenges to the availability of cancer therapeutic trials in community oncology practices include inappropriateness of trial designs and significant system-, patient-, and physician-level barriers resulting in less than 5% enrollment.[9]

History of NCI programs designed to facilitate community oncology research

Since 1982, NCI has initiated several programs to improve access to NCI-sponsored oncology clinical research, aiming to engage community physicians and academic medical centers and to facilitate the incorporation of research findings into practice. Two such networks, the Community Clinical Oncology Program (CCOP) and the Minority-Based Community Clinical Oncology Program (MB-CCOP),[10] were created to increase participation in clinical trials. MB-CCOP was developed to provide infrastructure for clinical trials in the institutions that serve communities with large minority and underserved populations. In 2007, NCI expanded its efforts by creating the NCI Community Cancer Centers Program (NCCCP). NCCCP was a pilot, public-private program emphasizing new research and care delivery partnerships with organized patient communities, community-based health care providers, and academic researchers.[11] Self-reported data from NCCCP sites showed an increase of NCI-supported phase 3 studies by 16% compared with 8% nationally and an improvement of patient accrual by 66% compared with 30% nationally. Additionally, enrollment of racial and ethnic minorities in oncology trials increased by 82% (Figure 1). The accrual of patients aged 65 years or older also rose by 221%.[12] In 2014, NCI created the NCI Community Oncology Research Program (NCORP) to further community oncology clinical research. The goal of NCORP is aligning the 2 existing programs, CCOP, MBCCOP, their research bases, and NCCCP. NCORP is intended to build on the strengths of the CCOPs/MBCCOPs and NCCCPs and expand the scope of research to include cancer care

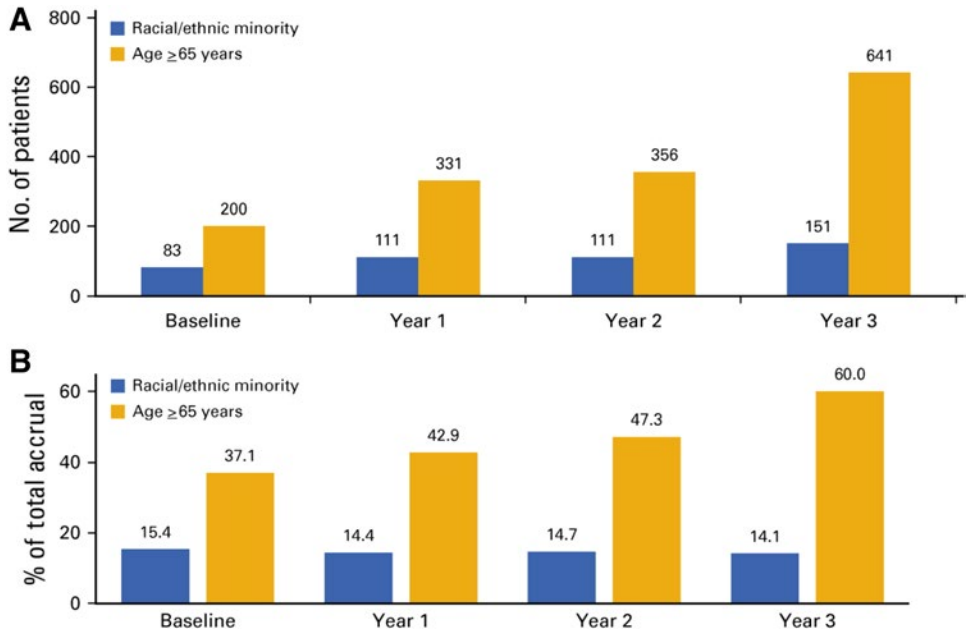

Figure 1. Experience of the National Cancer Institute Community Cancer Centers Program on community-based cancer clinical trials activity. Change in the accrual of underserved patients by (A) number and (B) percentage of total accrual. Reproduced with permission from Hirsch BR, Locke SC, Abernethy AP. Experience of the National Cancer Institute Community Cancer Centers Program on community-based cancer clinical trials activity. *J Oncol Pract*. 2016;12(4):e350–8.[12]

delivery. NCORP is intended to serve as a network to support clinical trials, cancer care delivery, and cancer disparities research. Core principles of NCORP are "including community-based organizations with a variety of research capacities linked to the NCI's Clinical Trials Network; providing support to oncology practices with varied organizational settings as a collaborative network; engaging patients within and outside of clinical trials, organizations, and clinicians as research subjects; encouraging commitment of management within organizations to support the research agenda; and integrating cancer care disparities, care delivery research, and clinical trials."[13]

Disparities in clinical trials

Despite lofty efforts by the NCI, however, clinical trial disparities persist, particularly with novel therapeutics through pharmaceutical industry–sponsored trials and not NCI. A study of 358 trials (pharmaceutical company–sponsored trials, 85; Southwest Oncology Group [SWOG] Cancer Research Network trials, 273; comprising 93,825 patients [pharmaceutical company-sponsored trials, 46,313; SWOG trials, 47,512]) for 15 cancer types from 2008-2018 also found significant underrepresentation of Blacks in pharmaceutical company–sponsored trials compared with SWOG trials (2.9% vs 9.0%), which was consistent across individual cancer types.[14] Race reporting is frequently omitted in clinical trials resulting in regulatory approval but is worse in studies outside regulatory purview. Between 2008 and 2018, only 7.8% of 230 trials (recruiting 112,293 patients) documented the 4 major races in the US. The representation of trial participants was 76.3% White, 18.3% Asian, 3.1% Black, and 6.1% Hispanic. In perspective, compared with their proportion of US cancer incidence, this underrepresents the proportion of Blacks and Hispanics (22% and 44% of expected, respectively) compared with Whites and Asians (98% and 43.8% of expected, respectively).[15,16] This gap in representation is worse for specific tumor types, particularly in prevalence-adjusted participation for cancers that are more common in African Americans.[17] Pooled data from 9 large cooperative group clinical trials in newly diagnosed MM over 2 decades showed only 18% of participants were non-White,[18] shocking for a disease with incidence rates in Blacks more than double those seen in Whites (15.9 vs 7.5 cases per 100,000). This trend also extends to mortality (5.6 vs 2.4 MM deaths per 100 000 for African Americans compared with Whites.[19,20] Additionally, in pivotal trials leading to US regulatory approval of immune checkpoint inhibitors, Black patients constituted less than 4% of enrollees. This is particularly problematic because clinical responses to immunotherapeutic agents depend on unique, individual, frequently racially determined, genetically mediated host and tumor biological interactions.[21]

NCI has also mandated NCI-designated comprehensive cancer centers to create catchment areas that promote increased community participation in clinical research, but recent data in patients with acute myelogenous leukemia showed that over a 15-year study, there were 3041 trial enrollees at US sites; national incidence adjusted enrollment odds by race-ethnicity showed that non-Hispanic Black, non-Hispanic Asian, and Hispanic persons were enrolled at significantly lower rates than non-Hispanic Whites (NHW). Non-Hispanic Native American enrollment was significantly higher. Enrollment odds were lower for non-Hispanic Black, non-Hispanic Asian, and Hispanic enrollees at comprehensive cancer center sites when adjusted by catchment area incidence (Figure 2). Among trial enrollees, there were no univariable predictors of biobank participation; however, NHW race-ethnicity (OR 1.33; 95% CI 1.12, 1.57; $P<0.001$) was associated with correlative study participation. Multivariable models of correlative study participation, with predictors selected based on univariable significance, are for all trial enrollees and when restricted to biobank enrollees; in both cases, the NHW race predicted participation.[22]

The American Cancer Society estimates that 89 380 new cases of lymphomas will be diagnosed in the US in 2023, with 21 080 estimated deaths.[23] Despite improvements in treatments for hematologic malignancies and specifically in lymphomas, disparities in outcomes remain. In non-Hodgkin's lymphomas, recent data showed that compared with White patients at diagnosis, Black patients were younger and more likely to have ≥1 comorbidity, be HIV positive, and have both B-symptoms and stage IV disease (all $p<0.001$). Compared with age-matched White patients, Black patients age ≤60 had worse median overall survival (OS) (46 vs 76 months) along with 5- and 10-year OS (65% vs 69%) (all $p<0.001$). Comparable results were seen for Black and White patients between the ages of 61 and 79 years, but these differences were not demonstrated for patients ≥80 years. On multivariate analysis, Black race was independently associated with worse OS (HR 1.06; CI 1.01-1.10; $p = 0.02$). Interestingly, the propensity-matched analysis demonstrated no significant OS difference between Black and White patients (median 127 vs 117 months; HR 1.0; CI 0.94-1.06; $p = 0.90$).[24] Comparable results were also seen in patients with chronic lymphocytic leukemia (CLL). Results from the National Cancer Database of CLL patients diagnosed from 2004-2018 showed that White patients compared with Black patients had a shorter median OS of 7.0 years (CI 6.7-7.3 years) versus White patients' (9.14 years [CI 9.0-9.3]); $p<0.001$), as well as inferior OS at 5 years (61% vs 69%) and 10 years (36% vs 46%), $p<0.001$. On a multivariate analysis adjusted for age and Charlson-Deyo score, Black race was independently associated with shorter OS (HR 1.51 [CI 1.46-1.57]; $p<0.001$). Referenced to the White population, Black patients diagnosed between 2004 and 2006 had an HR of 1.64 (CI 1.52-1.76) for mortality, and those diagnosed between 2016 and 2018 had an HR of 1.64 (CI 1.44-1.85).[25] This was a surprising finding, given the availability of Bruton's tyrosine kinase and BCL-2 targeted inhibitors in treating CLL over the same period. Pivotal studies of targeted agents currently approved for CLL in the US enrolled a limited number of Black patients.[26]

Racial disparities are due to several factors, chiefly the lack of access to high-quality care across the cancer continuum, including participation in clinical research. Due to emerging complex treatment protocols, this issue is particularly important in high-risk hematologic malignancies. Thus, strategies to decrease these disparities must include an attempt to close the research participation gap. However, increasing access alone is insufficient to close these gaps. For example, even among individuals with a median annual household income of ≥$75,000, 5-year relative cancer survival is lower among Black people (67%) than among White people (72%[27]).

Clinical trial disparities also result in the creation of 3 main problems of health care big data disparities: data absenteeism (lack of representation from underprivileged groups), data chauvinism (faith in the size of data without considering quality and contexts),[28] and, in its most extreme form, what we now term

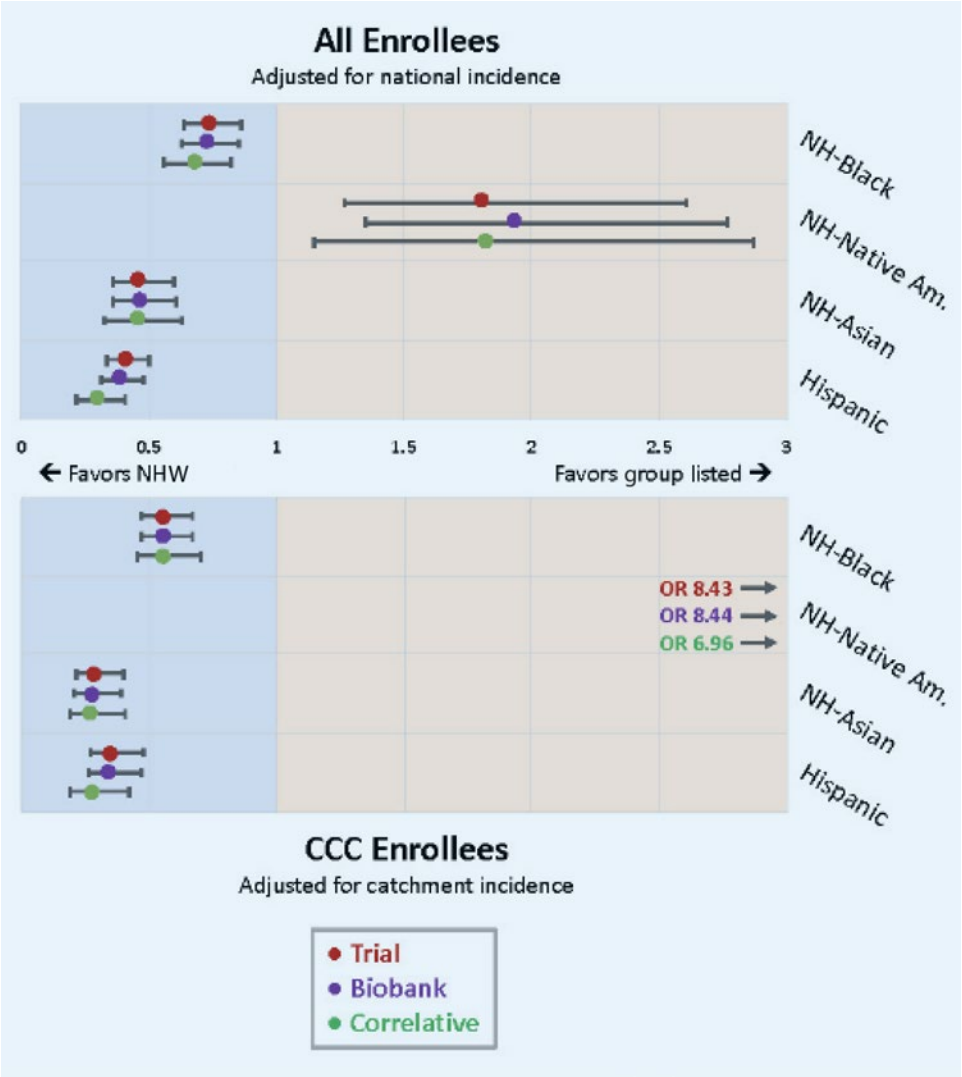

Figure 2. Enrollment odds versus non-Hispanic Whites. Reproduced with permission from Hantel et al.[22]

data hallucination (the assumption and use of nonexistent data to generalize treatment recommendations, outcomes, and results). For illustration and relevant to our clinical case, examples of these problems are seen in the clinical studies of polatuzumab[29] in the initial treatment of DLBCL (7% Black and Hispanic enrollment), chimeric antibody receptor T-cell therapy in relapsed DLBCL (5% Black and Hispanic enrollment),[30] and the generation of the widely used IPI[31] respectively (no racial or ethnicity data reported).

Barriers to participation in clinical trials[32]

Barriers to participation in clinical trials (Figure 3) typically disproportionally affect minority patients and ultimately results in delayed accrual, delayed generation of clinical data, and the generalizability of such data to all persons, thus promoting outcome disparities. Therefore, addressing such barriers may also improve cancer population outcomes. Improving clinical trial availability in community oncology practices where most cancer patients are treated can uniquely improve and address these disparities.

Structural barriers

1. Access to a clinic can be influenced by many structural factors, such as transportation, travel costs, access to insurance, and availability of childcare
2. Availability of a clinical trial for the patient's histology and stage

Clinical barriers

1. Narrow eligibility criteria

Physician attitudes

1. Physician decision or preference, a primary reason for nonparticipation in half the patients for whom a protocol was available and the patient was eligible
2. Lack of appropriate incentives to participate in clinical research
3. Time-consuming trial paperwork
4. Obtaining informed consent

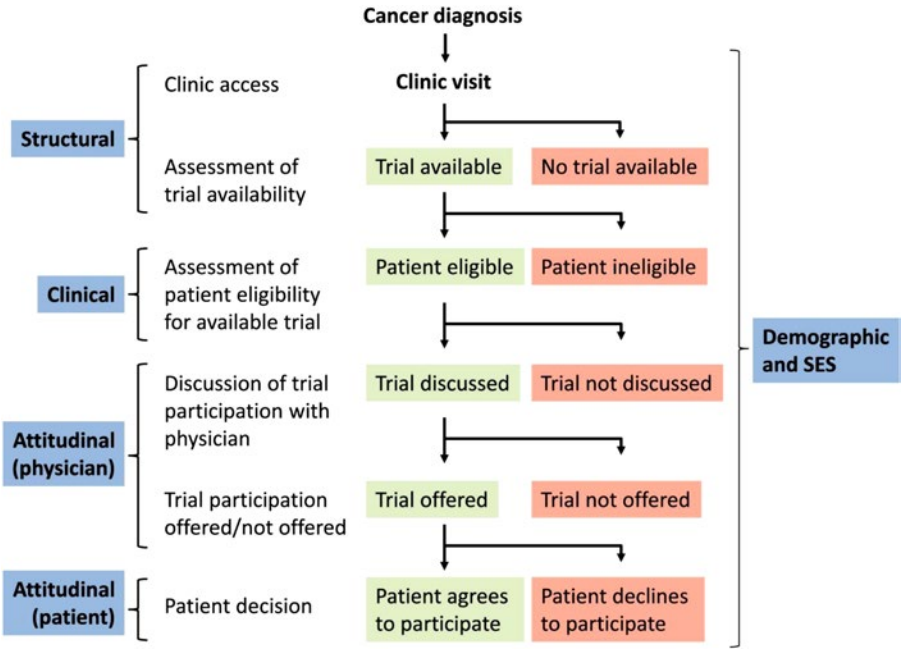

Figure 3. Model pathway of trial enrollment process. SES, socioeconomic status. Reproduced with permission from Unger JM, Cook E, Tai E, Bleyer A. The role of clinical trial participation in cancer research: barriers, evidence, and strategies. *Am Soc Clin Oncol Educ Book*. 2016;35:185–198.[32]

Patient attitudes

1. Patient unease or fear about the prospect of participating in clinical trials, including residual mistrust of medical science due to past abuses such as the infamous Tuskegee Syphilis Study or the history of human experimentation with radiation following World War II
2. Complicated consent forms
3. Patient dislike of randomization
4. Patient's unease about potentially toxic effects of chemotherapy in trials, especially for experimental therapies
5. Patient's ardent desire for a particular treatment they wish to receive after discussion with their physicians
6. More frequent monitoring than nontrial care, for example, traveling to and from the clinic
7. Concern about how to pay for trials

Demographic and socioeconomic disparities

1. Older age
2. Race
3. Low socioeconomic status

Overcoming barriers to participation in community clinical research for high-risk hematologic malignancies

Our patient illustrates the challenges of clinical trial participation for minority high-risk lymphoma patients treated in the community. First, the lack of minority enrollment in major clinical trials prevents us from truly estimating his prognosis using the IPI, potentially resulting in us underestimating his clinical risk (data hallucination). Second, significant structural and personal barriers precluded his participation in clinical studies that could have improved his survival. Additionally, upon relapse, his access to more complicated but potentially curative therapy was impacted by the lack of this therapy's immediate availability in the community due to the limited participation of community oncologists in CAR-T trials, thus impacting its clinical availability at community practices and resulting in further outcome disparities. Thus, strategies to overcome and minimize these barriers are desperately needed to improve outcomes for high-risk hematologic malignancies. These strategies include enhancing community oncology access to clinical trials and the participation of diverse populations, including our patient.

We recommend the adoption of our 5-step strategy at research sites and sponsors to overcome these disparities and to promote clinical research in community oncology practices. DRIVE[33] is a practical, immediately actionable 5-step strategy for promoting and improving diversity, equity, inclusion, and access (DEIA) in clinical trials for minority patients. DRIVE aims to use these strategies to correct inequalities and promote the overall health of humankind, as established in the Greenberg Report,[34] equating diversity and safety due to the potentially generalizable clinical data generated. Additionally, DRIVE uses proven principles and techniques to create meaningful improvements in cancer care and outcomes.

DRIVE

D: Diversity officer for clinical research studies; to develop an actionable, flexible, and prospective diversity plan for clinical research. Diversity officers should be funded by study sponsors and institutions as part of the clinical trial enterprise, very similarly to funding of data safety and monitoring boards.

R: Ranking of clinical studies for diversity; generating an informational tool for determining clinical research diversity (Figure 4). Ranking should be based on independent audits of self-reported

Score calculation:

1. Identify disease burden (eg, prevalence) by demographic mix, in this case race and ethnicity.

2. Calculate the proportion of the disease burden that minority groups* account for individually and as a group (ie, the proportion of the disease burden for all minority groups combined).

3. Calculate the proportion of the trial enrollees that minority groups account for individually and as a group (ie, the proportion of enrollees for all minority groups combined).

4. Divide the proportions of enrollees from each group, and minority groups combined, by their proportionate disease burden (eg, if Hispanic disease burden is 18% and Hispanic enrollment is 12%, 0.12/0.18 = 67%). This proportion is referred to as the diversity proportion.

Scoring:

Score†	Overall diversity proportion	Individual diversity proportions by race-ethnicity
0	≤20%	N/A
1	21%-40%	None >50%
2	21%-40%	At least 1 proportion >50%
3	41%-60%	At least 2 proportions >60%
4	61%-80%	At least 3 proportions >80%
5	>80%	At least 3 proportions >80%

Figure 4. DRIVE rank score. *Minority groups in the US are self-defined by the participants and are listed as follows: Hispanic White and Hispanic and non-Hispanic African American or Black, Native American, Asian, Pacific Islander, and mixed race. In other countries, minorities should be defined as appropriate, based on societal norms and internationally medically acceptable groups/nationalities. †Studies will be ranked at the next lower rank if all criteria for next higher rank are not reached. Reproduced with permission from Birhiray and Birhiray.[33]

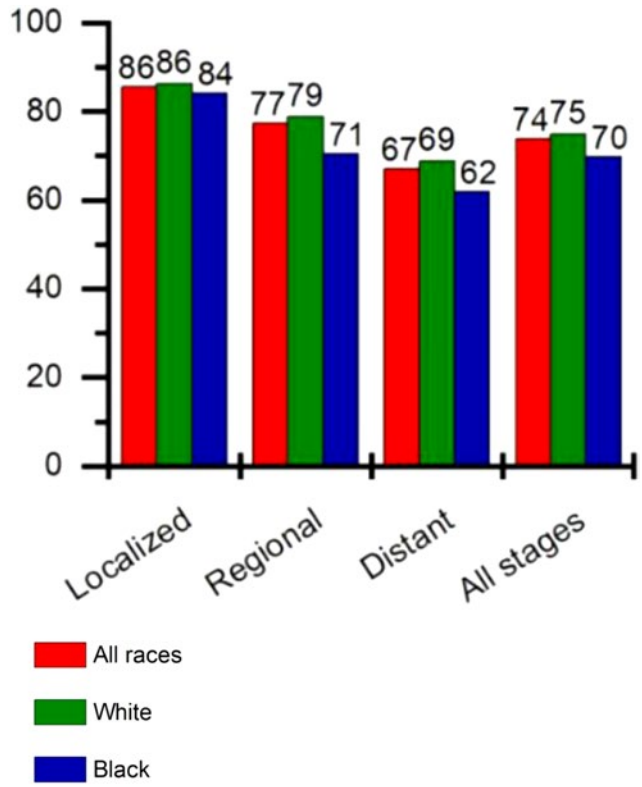

Figure 5. Lymphoma survival. Five-year relative survival for selected cancers by race and stage at diagnosis, United States, 2012 to 2018. White and Black race categories are exclusive of Hispanic ethnicity. Reproduced with permission from Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics, 2023. *CA Cancer J Clin*. 2023;73(1):17–48.[23]

accrual data and generated by DEIA promoting heath care organizations and major medical societies.

I: Individual DEIA plan; created by each investigator to promote enrollment of diverse subjects.

V: Verification of study diversity; creating a process for confirming research diversity. Verification should be based on the same auditing used for evaluating clinical trial data for efficacy and safety.

E: Elevate and enhance training of minority investigators and research team members; to promote minority patient participation by all clinical trial stakeholders

Conclusion

Strategies to enhance the participation of patients with high-risk malignancies in community practices can address health disparities and promote the early adoption of potentially curative therapies in community oncology practices. Outcomes for lymphomas are significantly affected by race, as shown in the clinical case presented, as well as in the other high-risk hematologic malignancies (Figure 5). Thus, efforts to overcome barriers that potentially prevent clinical trial availability and enrollment in community oncology practices are important steps in this direction. Our recommendations include adoption of the DRIVE strategy, as well as a full-throated adoption of the elements promulgated in the US Food and Drug Administration Omnibus Act of 2022 by the pharmaceutical industry, including the creation of a prospective diversity plan for major clinical trials and expanding clinical trials to community oncology practices. Additionally, we suggest promoting the NCORP program's goals. These steps would further enhance clinical research availability in community oncology for high-risk hematologic malignancies.

Conflict-of-interest disclosure

Maya N. Birhiray is the daughter of Ruemu E. Birhiray.
Ruemu Ejedafeta Birhiray: no competing financial interests to declare.
Maya Nicole Birhiray: no competing financial interests to declare.

Off-label drug use

Ruemu Ejedafeta Birhiray: Nothing to disclose.
Maya Nicole Birhiray: Nothing to disclose.

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References

1. Shipp M, Harrington D, Anderson J, et al., the International Non-Hodgkin's Lymphoma Prognostic Factors Project. A predictive model for aggressive non-Hodgkin's lymphoma. *N Engl J Med*. 1993;329:987-994.
2. American Cancer Society Cancer Statistics Center. Estimated new cases 2023. https://cancerstatisticscenter.cancer.org/#!/data-analysis/NewCaseEstimated. Accessed 29 May 2023.
3. Leukemia and Lymphoma Society. Facts and statistics overview, general blood cancers. https://www.lls.org/facts-and-statistics/facts-and-statistics-overview. Accessed 27 May 2023.
4. Ambroggi M, Biasini C, Del Giovane C, Fornari F, Cavanna L. Distance as a barrier to cancer diagnosis and treatment: review of the literature. *Oncologist*. 2015;20(12):1378-1385.
5. Tucker TC, Charlton ME, Schroeder MC, et al. Improving the quality of cancer care in community hospitals. *Ann Surg Oncol*. 2021;28(2):632-638.
6. Petrelli NJ. A community cancer center program: getting to the next level. *J Am Coll Surg*. 2010;210(3):261-270.
7. Copur M. Inadequate awareness of and participation in cancer clinical trials in the community oncology setting. *Oncology* (Williston Park). 2019;33(2):54-57. https://www.cancernetwork.com/view/inadequate-awareness-and-participation-cancer-clinical-trials-community-oncology-setting. Accessed 30 April 2023.
8. Institute of Medicine (US) Committee on Cancer Clinical Trials and the NCI Cooperative Group Program; Nass SJ, Moses HL, Mendelsohn J, eds. Physician and patient participation in cancer clinical trials. In: A National Cancer Clinical Trials System for the 21st Century: reinvigorating the NCI Cooperative Group Program. Washington (DC): National Academies Press; 2010:4. https://www.ncbi.nlm.nih.gov/books/NBK220370/. Assessed 19 August 2023.
9. Wong AR, Sun V, George K, et al. Barriers to participation in therapeutic clinical trials as perceived by community oncologists. *JCO Oncol Pract*. 2020;16(9):e849-e858.
10. National Cancer Institute. Community Clinical Oncology Program & Minority Based-Community Clinical Oncology Program Accomplishments in Cancer Clinical Trial. https://prevention.cancer.gov/sites/default/files/2023-02/ccop-accomplishments-report.pdf. Accessed 30 April 2023.
11. Clauser SB, Johnson MR, O'Brien DM, Beveridge JM, Fennell ML, Kaluzny AD. Improving clinical research and cancer care delivery in community settings: evaluating the NCI community cancer centers program. *Implement Sci*. 2009;4:63.
12. Hirsch BR, Locke SC, Abernethy AP. Experience of the National Cancer Institute Community Cancer Centers Program on community-based cancer clinical trials activity. *J Oncol Pract*. 2016;12(4):e350-e358.
13. McCaskill-Stevens W, Lyss AP, Good M, Marsland T, Lilenbaum R. The NCI Community Oncology Research Program: what every clinician needs to know. *Am Soc Clin Oncol Educ Book*. 2013:33, e84-e89.
14. Unger JM, Hershman DL, Osarogiagbon RU, et al. Representativeness of Black patients in cancer clinical trials sponsored by the National Cancer Institute compared with pharmaceutical companies. *JNCI Cancer Spectr*. 2020;4:pkaa034.
15. Habr D, Ferdinand R. Addressing racial/ethnic disparities in cancer clinical trials: everyone has a role to play. *Cancer*. 2021;127(18):3282-3289.
16. Loree JM, Anand S, Dasari A, et al. Disparity of race reporting and representation in clinical trials leading to cancer drug approvals from 2008 to 2018. *JAMA Oncol*. 2019;5(10):e191870.
17. Al Hadidi S, Mims M, Miller-Chism CN, Kamble R. Participation of African American persons in clinical trials supporting U.S. Food and Drug Administration approval of cancer drugs. *Ann Intern Med*. 2020;173(4):320-322.
18. Ailawadhi S, Jacobus S, Sexton R, et al. Disease and outcome disparities in multiple myeloma: exploring the role of race/ethnicity in the cooperative group clinical trials. *Blood Cancer J*. 2018;8(7):67.
19. DeSantis CE, Miller KD, Goding Sauer A, Jemal A, Siegel RL. Cancer statistics for African Americans, 2019. *CA Cancer J Clin*. 2019;69(3):211-233.
20. Bhatnagar V, Gormley N, Kazandjian D, et al. FDA analysis of racial demographics in multiple myeloma trials. *Blood*. 130(suppl 1):4352.
21. Nazha B, Mishra M, Pentz R, Owonikoko TK. Enrollment of racial minorities in clinical trials: old problem assumes new urgency in the age of immunotherapy. *Am Soc Clin Oncol Educ Book*. 2019;39:3-10.
22. Hantel A, Kohlschmidt J, Eisfeld A, et al. Race-ethnic enrollment disparities over 15 years of alliance/CALGB acute myeloid leukemia clinical trials, biobanks, and correlative science protocols. *Blood*. 2021;138(suppl 1):111.
23. Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics, 2023. *CA Cancer J Clin*. 2023;73(1):17-48.
24. Ermann DA, Vardell V, Fitzgerald L, Shah H, Stephens DM, Hu B. Racial disparities affecting Black patients with diffuse large B-cell lymphoma. *J Clin Oncol*. 2022;40(suppl 16):7507.
25. Vardell V, Ermann DA, Shah H, Fitzgerald L, Hu B, Stephens DM. Influence of racial and ethnic identity on overall survival in patients with chronic lymphocytic lymphoma. *J Clin Oncol*. 2022;40(16_suppl):7508.
26. Iyer P, Wang L. Emerging therapies in CLL in the era of precision medicine. *Cancers (Basel)*. 2023;15(5):1583.
27. 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*. 2022;72(2):112-143.
28. Lee EWJ, Viswanath K. Big data in context: addressing the twin perils of data absenteeism and chauvinism in the context of health disparities research. *J Med Internet Res*. 2020;22(1):e16377.

29. Tilly H, Morschhauser F, Sehn LH, et al. Polatuzumab vedotin in previously untreated diffuse large B-cell lymphoma. *N Engl J Med*. 2022;386(4):351-363.
30. Locke FL, Miklos DB, Jacobson CA, et al. Axicabtagene ciloleucel as second-line therapy for large B-cell lymphoma. *N Engl J Med*. 2022;386(7):640-654.
31. Sehn LH, Berry B, Chhanabhai M, et al. The revised International Prognostic Index (R-IPI) is a better predictor of outcome than the standard IPI for patients with diffuse large B-cell lymphoma treated with R-CHOP. *Blood*. 2007;109(5):1857-1861.
32. Unger JM, Cook E, Tai E, Bleyer A. The role of clinical trial participation in cancer research: barriers, evidence, and strategies. *Am Soc Clin Oncol Educ Book*. 2016;11(36):185-198.
33. Birhiray MN, Birhiray RE. Practical strategies for creating diversity, equity, inclusion, and access in cancer clinical research: DRIVE. *Blood Adv*. 2023;7(8):1507-1512.
34. National Heart Institute. Organization, Review, and Administration of Cooperative Studies (Greenberg Report): a Report from the Heart Special Project Committee to the National Advisory Heart Council, May 1967. Accessed 20 May 2023. https://sph.unc.edu/wp-content/uploads/sites/112/2013/07/greenberg_report.pdf.

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