Proceedings of ICMMGH 2027 Symposium: Clinical OMICS for Drug Discovery and Personalized Medicine
DOI: 10.54254/2753-8818/2027.MB38007

CAR-T Cell Therapy Accessibility: Barriers and Strategies for Improving Patient Access

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Abstract. Currently, antigen receptor T-cells therapy (CAR-T) cell therapy is an innovative immunotherapy that has a high effectiveness in treating certain hematologic cancers. However, despite the effectiveness, its access is limited to complex autologous manufacturing, high costs and financial burden, specialized treatment-center requirements, and geographical disparities. All these aspects contribute to inequalities in access to CAR-T cell therapy, preventing some eligible patients from receiving treatment. To address these barriers and improve equitable access to CAR-T cell therapy, researchers and healthcare systems have proposed several strategies across technological, healthcare systems, and economic aspects. Such as shortening the manufacturing time of CAR-T cell product, increasing the insurance coverage on CAR-T cell product, or increasing the number of specialized treatment centers. Simarily, the researcher develops allogeneic CAR-T or off-the-shelf therapy to standardize the treatment. However, this future treatment is still facing some major challenges around effectiveness and manufacturing. By doing this, the healthcare system could expand the health equity and access of CAR-T cell therapy to make more patients able to benefit from effective treatment.

Keywords: CAR-T cell therapy, accessibility, barriers

1. Introduction

In the present days, some advanced cancer treatments such as chimeric antigen receptor T-cells (CAR-T cell therapy) face a challenge of limited accessibility. CAR-T cell therapy is a contemporary innovative form of cancer immunotherapy. By genetically modified a patient's T cells to recognize and kill specific cancer antigen, CAR-T cell therapy has achieved important clinical outcomes in certain hematologic malignancies. This therapy mechanism enables the immune cell to target cancer cells or target specific hematologic cancer-related antigens such as cluster of differentiation 19 (CD19) and B-cell maturation antigen (BCMA) precisely while demonstrating its effectiveness and future potential.

Despite its therapeutic potential, CAR-T cell therapy is not equally accessible to all eligible patients. In this paper, the accessibility refers to the eligibility of a patient to obtain a CAR-T cell therapy when it is clinically appropriate. However, the limited capacity for complex individualized manufacturing and expensive treatment and manufacturing cost limits makes access remain limited. Meanwhile, the limited number of specialized treatment centers that can perform this treatment, and

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DOI: 10.54254/2753-8818/2027.MB38007

the consequential cost of traveling and temporary housing for access to those centers also contribute to the limit of access. Last, the insurance coverage and resource-limited healthcare systems strengthen the limitation and unequal access. Therefore, the treatment could be medically effective but still impact limit population as unequal accessibility among the eligible patients, making some cannot receive it.

CAR-T cell therapy is a complex and highly specialized treatment process with high standard requirements like personalized manufacturing, specialized treatment centers, and close clinical monitoring. Thus, these requirements cause the high cost and lengthy manufacturing process, which creates the gaps between CAR-T cell therapy's clinical effectiveness and real-world patient access. Even the CAR-T cell therapy is clinical effectiveness; some patients may experience treatment delays as limited manufacturing capacity, some may impede from reaching financial difficulties, and some may never reach CAR-T centers. Thus, the various CAR-T cell therapy access among the eligible patients demonstrates a great public-health challenge of transforming medical innovation into equitable health outcomes, making more patients benefit from healthcare effectively and on time.

For improving access, researchers and healthcare systems propose some future possibilities. Such as shortening the CAR-T cell product manufacturing time to increase its capacity, increase the insurance coverage for CAR-T cell product, or increase more specialized centers to increase the availability and accessibility of the CAR-T cell therapy and to improve the health equity. Meanwhile, the researchers propose new therapy called allogenic or off-the-shelf CAR-T cell therapy for the purpose of standardizing the CAR-T treatment from personalization by using a CAR-T product suitable for multiple different patients. However, this plan still faces the challenges such the treatment effectiveness and manufacturing difficulties.

Overall, this paper examines the current availability and accessibility of CAR-T cell therapy while identifies the manufacturing, clinical, economic, and geographical barriers that limit its equitable access, and evaluates the emerging future technical and healthcare-system strategies that may improve the accessibility.

2. Current clinical availability and accessibility of CAR-T therapy

2.1. Clinical availability

Currently CAR-T cell therapy is mainly approved for treating hematologic malignancies by FDA. By genetically engineered T-cells to target CD19 or BCMA antigen that is commonly found on the surface of hematologic cancer cells, CAR-T cell therapy could effectively treat the hematologic malignancies. Therefore, the major diseases that CAR-T cell therapy treated is B-cell leukemia, lymphomas, and multiple myeloma. Since CD19 is commonly found on the surface of B-cell leukemias and lymphomas cells, BCMA is found on the plasma cells. The clear target antigens enable CAR-T cell therapy to be effective in treating hematologic malignancies. In the prove, a review for six FDA-approved CAR-T products for hematologic malignancies have demonstrated great effectiveness in improving progression-free survival for multiple myeloma, overall survival for large B-cell lymphoma, and cancer remission for B-cell acute lymphoblastic leukemia, follicular lymphoma, and mantle cell lymphoma [1]. However, despite CAR-T cell therapy is approved and effective, it still has limited impact on ordinary people as lacking accessibility.

Presently, CAR-T has received regulatory approval and become commercially available in multiple countries. However, in the real-world, access to CAR-T products varies across countries' healthcare systems due to multiple considerations. Such as the difference in reimbursement,

DOI: 10.54254/2753-8818/2027.MB38007

manufacturing capacity of CAR-T product, and especially the availability of the qualified treatment center.

2.2. Economic accessibility

Economically, ordinary people find it difficult to access CAR-T cell therapy as its high manufacturing and treatment costs. Since this therapy isn't standardized treatment, that is a treatment suitable for everyone. On the other hand, it is highly personalized that varied from person to person as each treatment required the patient's own T cells. Additionally, CAR-T cell therapy involves multiple manufacturing and preparing steps including leukapheresis, genetic modification of T cells and expansion, and lymphodepleting chemotherapy. Beyond this apparent cost, hospitalization and follow-up care are also expensive. In a U.S. study of commercially insured patients with relapsed or refractory B-cell lymphoma, the median cost per patient of CAR-T cell therapy is $608,100, the cost of product alone is $402,500, and there are 8.5% patients had total costs exceeding $1 million [2]. This prohibitive cost increases the patient's financial burden and decreases their accessibility and affordability. Especially the studies about the public reimbursement decision of international CAR-T cell therapy across G20 countries and several additional countries shows only 48% of CAR-T product-indication pairs were allowed for reimbursement by public health systems [3]. Thus, high cost and low reimbursement contribute to unequal access across social classes and countries.

2.3. Geographical and healthcare-system accessibility

Geographically, CAR-T cell therapy's complex processing and trained medical professionals' requirement required specialized cellular therapy centers for performing. This high requirement of location also limits the patient's accessibility through time-consuming transportation, expensive lodging, or relocation fee. For example, a study about the geographic access to CAR-T cell therapy for multiple myeloma in the United States shows that south U.S. has a highest multiple myeloma burden but the lowest proportion of patients living within a one-hour drive to the authorized treatment center [4]. This study indicates that at least within the U.S., the geographical distribution of CAR-T centers does not match the distribution of the patients and their needs. Therefore, the patients who live in the U.S. and far away from those centers need to spend more time and money on transportation or relocation. In this way, the geographical location of the CAR-T center and the financial burden of CAR-T cell therapy reinforce each other to also contribute to unequal access through physical barriers and cost in traveling to limit accessibility.

3. Barriers to CAR-T access and public health impact

3.1. Manufacturing barriers to CAR-T access

One of the major reasons for the expensiveness of CAR-T cell therapy is its complex, time-consuming, and limited capacity manufacturing process. In a study of surveying manufacturing accessibility of CAR-T among the institutions involved in producing it showed 70% identified cost constraints and regulatory complexity as barriers, while 57% reported facility requirements as a barrier [5]. CAR-T cell therapy is a highly personalized treatment that requires the T cells obtained from the individual patient to be manufactured into the product. This process is more complicated and time-consuming than conventional mass-producing standardized treatment. Especially, the CAR-T production involves developed facilities and strict quality requirements. Therefore, the

DOI: 10.54254/2753-8818/2027.MB38007

manufacturing process takes a long time while a limited number of patient products could be manufactured at a time. These manufacturing issues are especially important for CAR-T patients with serious cancer. The therapy may technically be available, but sometimes manufacturing could prevent the patient from receiving it and getting treated on time, to lose access to the treatment. Thus, even the CAR-T cell therapy might be economically and geographically available for the patients, but it doesn't mean it still doesn't mean it is accessible. Since the manufacturing barrier is also a challenge to the eligibility of the patient from getting treatment.

3.2. Clinical barrier to CAR-T access

Besides those reasons, the clinical barrier of the patient's health status and their rapid cancer progression limited the patient from accessing CAR-T cell therapy effectively. A 2024 study states that receiving CAR-T cell therapy, the patient should have good organ function and physical fitness. However, the study also states most of the patients who are eligible for the CAR-T cell treatment have bad health condition and multiple comorbidities, which currently has no consensus or guidelines on accessing eligibility for this group of patients [6]. Usually the target patient of CAR-T cell therapy has relapsed or refractory cancer and may already have undergone multiple treatments, so their overall health is varied considerably for accessing CAR-T cell therapy. Therefore, even if the treatment is clinically available for the patient, it doesn't guarantee it is accessible since the patient must evaluate to be suitable to safely receive the treatment. Also, rapid cancer progression prevents the patient from accessing slow-processing CAR-T cell therapy. A study of U.S. and U.K. healthcare survey shows that estimated 32% of referred U.S. patients and 27% of referred U.K. patients did not proceed from referral to leukapheresis. Among those patients 58% of U.S. respondents and 74% of U.K. respondents that identified with a rapid disease progression as a reason patient did not proceed to leukapheresis [7]. Since the CAR-T manufacturing process is slow, the patients with aggressive cancer may deteriorate their physical condition to become clinically unsuitable for CAR-T cell therapy before the product is ready. Overall, the patients might be clinically available for the treatment, but considerably their health condition still limited their accessibility to the treatment.

3.3. Public health and health equity consequences

Lastly, socioeconomic status, financial constraints, insurance, race, and awareness all contribute to the health inequity between the people. A 2026 study of access to HCT or CAR-T cell therapy based on US databases has conducted the patient with lower likelihood of receiving proper therapy including old people, racial or ethnic minority, people with low socioeconomic status, or no private insurance [8]. Therefore, the challenge of CAR-T access is shaped by socioeconomic and healthcare-system inequalities. Especially the insurance problem, from the previous citation shown only estimated 48% of CAR-T product allowed for reimbursement [3]. Also, among the commercially insured U.S. patients with relapsed or refractory B-cell lymphoma, the median cost of CAR-T product is $402,500, while the median patient out-of-pocket copayment reported in the study was $510 [2]. These low insurance covering rates and high cost without insurance demonstrate the long-lasting problem within the medical insurance industry. Also, it demonstrates that difference in insurance coverage may contribute to unequal opportunities for accessing treatment.

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4. Strategies to improve CAR-T accessibility

4.1. Technological and manufacturing strategies to improve CAR-T accessibility

Currently, for improving health equity, scientists try to improve the manufacturing time span of CAR-T, making it more accessible technologically. For example, a 2025 study identify the complex manufacturing process, and capacity constraints challenge the accessibility of CAR-T cell therapy and argue that rapid-manufacturing could transform the delivery [9]. As discussed in the previous, the patient who needed CAR-T cell therapy usually has aggressive cancer and bad health condition, unable to wait for the treatment as rapid cancer progression. Therefore, shortening the manufacturing time of CAR-T could potentially reduce their waiting period and progression, making the patient get treatment in a more suitable and proper health status. Meanwhile, the scientists are trying to standardize the CAR-T cell treatment to potentially decrease the high production costs, fix the delay treatment, and control the product quality. As evidenced by a study discusses how allogeneic CAR-T, a therapy to produce CAR-T cells from healthy donors and applied for multiple patients, could potentially address some of the manufacturing barriers discussed above by reducing manufacturing time and improving scalability. However, this new approach also faces challenges such as GVHD, host rejection, and limited persistence remain [10]. Therefore, the allogeneic therapy is a high potential future strategy that shifts CAR-T cell therapy from an individualized manufacturing model toward a more disciplined and readily production, decreasing the needed cost and time for producing to increase its accessibility. However, there are still lasted multiple major challenges in the treatment of accessibility and effectiveness remained to be addressed.

4.2. Healthcare-system strategies to improve CAR-T accessibility

Additionally, the scientists also invented the healthcare-system solution to expand insurance coverage and also increased qualified treatment centers and facilities to increase the CAR-T cell therapy's accessibility. Since the CAR-T is expensive, the insurance is important to reduce the administrative and financial barrier to increase the accessibility of the treatment. Especially, a study that surveyed major U.S. HCT and CAR-T centers has conducted that the patient needs potentially length authorization from their insurer before having the CAR-T process [11]. This demonstrates not only that medical technology is important to the treatment of accessibility; the efficiency of the healthcare system is also vital. Thus, there is a need to renew and improve the insurance system to build a standardized and effective pre-approval system. However, insurance reform could only guarantee economic accessibility. Thus, there is still a need for an increasing number of qualified treatment centers and facilities to reduce the geographical barrier, making the patients everywhere able to access the treatment quickly and cost-effectively.

5. Conclusion

Overall, the major challenge of CAR-T cell therapy is not its clinical effectiveness but ensuring that eligible patients can access the treatment in real life. Despite its clinical effectiveness, its access remains limited and unequal as the economic, geographic, manufacturing, clinical, and health system limitations. Such as the high cost, limited specialized treatment centers, complex autologous manufacturing process and limited capacity, long waiting period for CAR-T product, and the few insurances coverage and high financial burden. By identifying these barriers, CAR-T's success

DOI: 10.54254/2753-8818/2027.MB38007

should not be evaluated alone by its clinical effectiveness, but by whether eligible patients can be accessed and benefit from it in real-life.

The barriers to CAR-T accessibility are interconnected rather than independent. Since CAR-T cell therapy is a personalized treatment, its manufacturing process is individualized. Therefore, the whole manufacturing process is complex and has a long-manufacturing period. Additionally, the limited insurance coverage on CAR-T cell products increases the patient's financial burden. Meanwhile, limited infrastructure making a limited number of CAR-T cell products could be manufactured at the same time. Therefore, those manufacturing difficulties make the patients have a long waiting period before accepting the treatment, which might cause the health of the patient with rapid cancer progression to become deterioration. Also, CAR-T cell therapy required a specialized treatment center with a qualified medical team to perform. Thus, the limited number of qualified centers that locate disproportionally might make the patient unable to access the treatment effectively and on time. Also, this scare center makes the patient need to move to where the center is located to access the treatment. Hence, it makes the patient afford extra transportation and housing costs. Therefore, all these aspects contribute to inequities in access, stopping the patient from reaching effective treatment.

To improve this limited accessibility, the medical and healthcare industry tries to shorten the manufacturing time, increase the insurance coverage on the CAR-T cell product, and increase the number of specialized treatment centers. By doing this, it could potentially reduce the clinical, financial, and the geographical barrier that the patient might face while trying to access the treatment. Also, alternatively, the researchers develop the allogenic or off-the-shelf treatment to try to standardize the CAR-T treatment by using a type of modified CAR-T cells to apply multiple different patients. However, this potential future strategy is still facing challenges such as treatment effectiveness and manufacturing.

Overall, as CAR-T technology continues to develop, accessibility remains an important part of evaluating its progress. Therefore, ultimately, the future success of CAR-T therapy will not depend on improving its treating effectiveness alone but also take the consideration of how to turn this medical innovation into an accessible and equitable benefits for the patients in account.

References

[1] Brudno, J. N., Maus, M. V., & Hinrichs, C. S. (2024). CAR T cells and T-cell therapies for cancer: A translational science review. *JAMA, 332*(22), 1924–1935. https://doi.org/10.1001/jama.2024.19462

[2] Di, M., Potnis, K. C., Long, J. B., Isufi, I., Foss, F., Seropian, S., Gross, C. P., & Huntington, S. F. (2024). Costs of care during chimeric antigen receptor T-cell therapy in relapsed or refractory B-cell lymphomas. *JNCI Cancer Spectrum, 8*(4), pkae059. https://doi.org/10.1093/jncics/pkae059

[3] Ge, A. Y., Feldman, W. B., Kaiser, M. F., Rejeski, K., Iacoboni, G., Narula, G., Chan, J. Y., Dickinson, M. J., Kesselheim, A. S., & Cliff, E. R. S. (2026). Global access to commercial CAR T-cell therapies: A cross-sectional study of health technology assessment across the G20 countries. *Blood, 147*(14), 1521–1531. https://doi.org/10.1182/blood.2025030872

[4] Blue, B. J., ElHabr, A. K., Derman, B. A., Ray, A., Ting, J., Hasegawa, K., Elsisi, Z., Farajkhah, K., Ayer, T., & Suvannasankha, A. (2026). Geographic variation and inequities in burden and access to CAR T-cell therapies for multiple myeloma in the US. *Clinical Lymphoma, Myeloma & Leukemia*, S2152-2650(26)00214-4. Advance online publication. https://doi.org/10.1016/j.clml.2026.07.009

[5] Gupta, D., & Shaz, B. (2025). Surveying local CAR T-cell manufacturing processes to facilitate standardization and expand accessibility. *Journal of Translational Medicine, 23*(1), 507. https://doi.org/10.1186/s12967-025-06400-x

[6] Akkad, N., & Chihara, D. (2024). License for a CAR T: Examining patient eligibility. *Seminars in Hematology, 61*(5), 284–289. https://doi.org/10.1053/j.seminhematol.2024.07.001

DOI: 10.54254/2753-8818/2027.MB38007

[7] Sureda, A., Adam, S. E., Yang, S., Griffin, E., Baker, J., Johnston, K., Navarro, F. R., Alhasani, S., Chhibber, A., Wang, A., & Mutebi, A. (2024). Logistical challenges of CAR T-cell therapy in non-Hodgkin lymphoma: A survey of healthcare professionals. *Future Oncology, 20*(36), 2855–2868. https://doi.org/10.1080/14796694.2024.2393566

[8] Hong, S., Espinoza-Gutarra, M. R., Shah, R., Demartino, P., Davies, S. M., Nemecek, E., Howard, D., DeSalvo, A. M., Meyer, C. L., Majhail, N. S., Preussler, J., Hall, A. G., Arteaga, A. G., Auletta, J. J., Khera, N., American Society of Transplantation, & Cellular Therapy (ASTCT)- National Marrow Donor Program (NMDP) ACCESS Initiative. (2026). What population-based databases reveal about equity in access to hematopoietic cell transplant and cellular therapy. *Blood Reviews, 77*, 101417. https://doi.org/10.1016/j.blre.2026.101417

[9] Chen, S., & Liu, D. (2025). Rapid manufacturing of CAR-T therapy: Strategies and impact. *Trends in Biotechnology, 43*(4), 745–748. https://doi.org/10.1016/j.tibtech.2024.09.013

[10] Chen, S., & van den Brink, M. R. M. (2024). Allogeneic "off-the-shelf" CAR T cells: Challenges and advances. *Best Practice & Research. Clinical Haematology, 37*(3), 101566. https://doi.org/10.1016/j.beha.2024.101566

[11] Kaparis, S., Eshaghi, K., Paruzzo, L., Doshi, J., Ruella, M., & Guerra, C. E. (2026). CAR-T for all? Barriers, facilitators, and interventions to commercial CAR T-cell therapy access. *Blood Reviews, 76*, 101358. https://doi.org/10.1016/j.blre.2025.101358