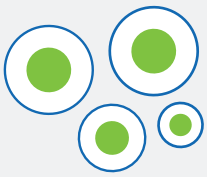
CAR T-Cell Therapy: Expanding & Ensuring Access to Revolutionary Cancer Treatment

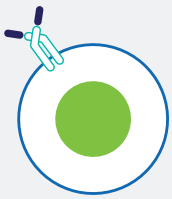
CAR T-cell therapy (chimeric antigen receptor T-cell therapy) is a groundbreaking cancer treatment that engineers a patient's own cells to attack and kill tumors. A personalized, next-generation treatment, CAR T is an essential tool for treating advanced forms of cancer and bringing new hope to patients and families.

How CAR T Works

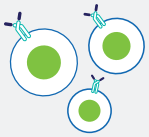
1. **T-Cell Collection:** A patient's T-cells, a type of white blood cell that fights infection, are collected from the patient's blood.



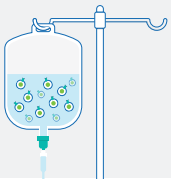
2. **Cell Re-Engineering & Manufacturing:** The T-cells are sent to a specialized manufacturing site where they are genetically engineered to produce new surface receptors, called chimeric antigen receptors (CARs), to target and kill cancer cells.



3. **Cell Proliferation:** The newly manufactured T-cells are multiplied and sent back to the hospital or center where the patient is being treated.



4. **Patient Treatment:** The CAR T-cells are returned to the patient's body, where they act as "living drugs" and have been shown in some cases to attack and destroy cancer cells.[1]



Hope for the Future

CAR Ts have become clinically proven, innovative options for patients who otherwise have limited treatment alternatives and poor prognoses. CAR T represents hope for many cancer patients who have exhausted all other treatment options, but only if it is accessible to them.

3 APPROVED THERAPIES

The FDA has approved three CAR T cell therapies for cancer treatment.[6]

410+ ACTIVE TRIALS[7]

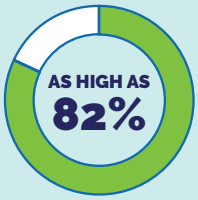
A variety of CAR T cell therapies are being evaluated in clinical trials for different types of cancer, including brain cancer, breast cancer, lung cancer, multiple myeloma and ovarian cancer.

Patient Population

CAR T therapies have been **approved to treat both children and adults** with blood cancers, such as lymphoma and leukemia. This unique approach harnesses the power of the immune system to deliver treatment to patients who previously had no other options.

While today's CAR T therapies may be the last, best hope for some patients with blood cancers, the future remains bright: Clinical trials are underway in earlier lines of care.[2]

Though all CAR T therapies are different, a number of trials have shown positive results. In FDA-approved clinical trials, patients saw an overall response rate (ORR) as high as 82%, a significant increase from the 63% ORR demonstrated by the traditional line of care, chemotherapy. [3]



Data has shown CAR Ts can both improve quality of life and extend life expectancy. Depending on clinical trial data, CAR T treatments that are being studied in earlier lines of care have shown better health outcomes and greater cost savings than the current standard of care, chemotherapy.[4 5]

Health Economics of CAR T

Cost-Effective Treatment: CAR T is a highly specialized treatment that is tailored to each individual patient. Studies from the *Journal of Clinical Oncology, the Institute for Clinical and Economic Review (ICER)* and the *Journal of the National Cancer Institute* have determined that CAR T is cost-effective, addresses unmet needs and offers treatments that are potentially curative. [8 9 10]

[1] Lim, Wendell A, and Carl H June. "The Principles of Engineering Immune Cells to Treat Cancer." Cell 168 (4): 724–40. 2017.
[2] "CAR T Cells: Engineering Immune Cells to Treat Cancer." National Cancer Institute. Cancer.gov. 30 Jul. 2019.
[3] Chavez, Julio C., Christina Bachmeier, and Mohamed A. Kharfan-Dabaja. 2019. "CAR T-Cell Therapy for B-Cell Lymphomas: Clinical Trial Results of Available Products." Therapeutic Advances in Hematology. 15 Apr. 2019
[4] Julia Lopes Garcia, et al. "CTL019 (Tisagenlecleucel): CAR-T Therapy for Relapsed and Refractory B-Cell Acute Lymphoblastic Leukemia." Drug Design, Development and Therapy. 2018.
[5] "FDA Approves CAR-T Cell Therapy to Treat Adults with Certain Types of Large B-Cell Lymphoma." U.S. Food and Drug Administration. 2019.
[6] "Approved Cellular and Gene Therapy Products." U.S. Food and Drug Administration. 29 Mar. 2019.
[7] Search of Modality: "CAR T Cells."Asgct.careboxhealth.com. Date accessed: 9 Oct. 2019.
[8] Lin JK, Lerman BJ, et al. "Cost Effectiveness of Chimeric Antigen Receptor T-Cell Therapy in Relapsed or Refractory Pediatric B-Cell Acute Lymphoblastic Leukemia." Journal of Clinical Oncology. 2018.
[9] "CAR-T Therapies: Final Evidence Report - ICER." 2017.
[10] Sarkar, Reith R et al. "Cost-Effectiveness of Chimeric Antigen Receptor T-Cell Therapy in Pediatric Relapsed/Refractory B-Cell Acute Lymphoblastic Leukemia." Journal of the National Cancer Institute. 14 Dec. 2018