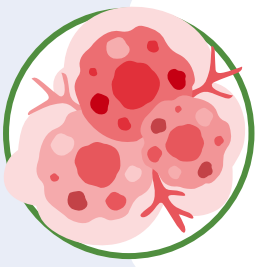
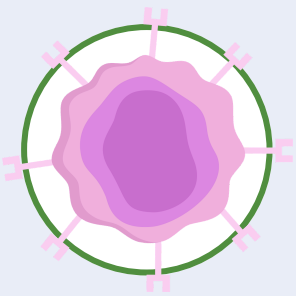
CAR T-CELL THERAPY

INFOGRAPHICS BY
RARE REVOLUTION

What is **CAR T-cell therapy**?



Chimeric antigen receptor T-cell therapy **(CAR T-cell therapy)** is a treatment initially developed to **harness the patient's own immune system** to more effectively **fight cancer**.[1]



Autologous CAR T-cell therapy is developed for **each individual patient** and **involves reprogramming the patient's own immune system cells** to manufacture a product which is used to target some forms of cancers, and most recently autoimmune diseases.

CAR T-cell therapy is a specialist treatment and it is only possible to have this treatment at a **registered CAR T-cell therapy hospital** with healthcare professionals who have the right expertise.[2]

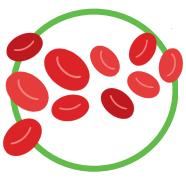
A specialist nurse collects the T-cells which are sent to a facility where **CARs are added**. For people with autoimmune disease, CAR T-cell therapy is currently **only available for people with certain diseases in clinical trials, subject to eligibility criteria**.[3]

CAR T-cell therapy: cancer VS autoimmune

CAR-T therapy was **originally developed to target malignant cancer cells** and to **treat B-cell-derived blood cancers**, such as leukemia and lymphoma. It produced dramatic and sometimes **long-lasting remissions** in patients **who have exhausted standard therapies**.[4]

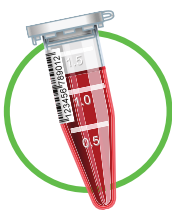
The potential use of **CAR T-cell therapy** is being **explored for autoimmune diseases**, such as lupus, systemic sclerosis, stiff person syndrome and generalised myasthenia gravis, to name a few.[5] For both certain cancers and autoimmune diseases, the **same target is found on B-cells**, including those that drive illness. CAR T-cells can **profoundly remove B-cells** even **deep within tissues**. Researchers hope this deep B-cell depletion can allow for an **"immune reset"**.

The process of **CAR T-cell therapy**



Step 1
Blood collection

The patient's **blood is taken** through a process called **apheresis**. The **T cells are collected**, and the other parts of the **blood are returned** to the patient's body.



Step 2
CAR T-cell creation

The **patient's T cells are sent to a manufacturing facility where CARs are added**. They are now CAR T cells designed to **find and destroy specific B cells**, including unhealthy ones that can contribute to autoimmune disease.



Step 3
Preparing for therapy

Before receiving CAR T cells, the **patient receives a pre-infusion, short course of low dose chemotherapy treatment** to help prepare their body for treatment. This is often referred to as **conditioning.**



Step 4
Treatment day

The patient's **CAR T-cells are returned to their body** as a potentially one-time infusion. Depending on the specific CAR T and an individual's response they may need a repeated dose over time, or retreatment with a different target.



Step 5
After treatment monitoring

After the infusion of CAR T-cells, the **patient is closely monitored for side effects** by the healthcare team at the clinical trial site. Long-term care may be overseen by the healthcare provider who originally referred the patient for CAR T-cell therapy. **Patients should be monitored** over the long term for **disease control and potential side effects**.[4]

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References

1. bmtinfonet.org/video/car-t-and-other-immunotherapies
2. cancerresearchuk.org/about-cancer/treatment/targeted-cancer-drugs-immunotherapy/car-t-cell-therapy
3. england.nhs.uk/commissioning/spec-services/advanced-therapy-medicinal-products/car-t-therapy
4. medicine.yale.edu/news-article/car-t-therapy-cancer-autoimmune-diseases
5. Schett G, et al. Lancet. 2023; 402:2034-2044.