

ACQUEST HEALTHCARE
AND STEM CELL R&D

CAR T-Cell Therapy

What is Car T-Cell Therapy?

A cancer treatment in which a patient's own T-Cells are modified in the lab to destroy cancer cells.

A T-Cell is a type of immune system cell that attacks cancer

For Car T-Cell Therapy, 50 ml of blood is collected from the patient.

A special gene called a “Chimeric Antigen Receptor” (CAR) is added to the patient's own **T-Cells** in the laboratory.

Large numbers of the modified T-Cell now called a CAR T-Cell are grown in the laboratory and given to the patient by infusion.

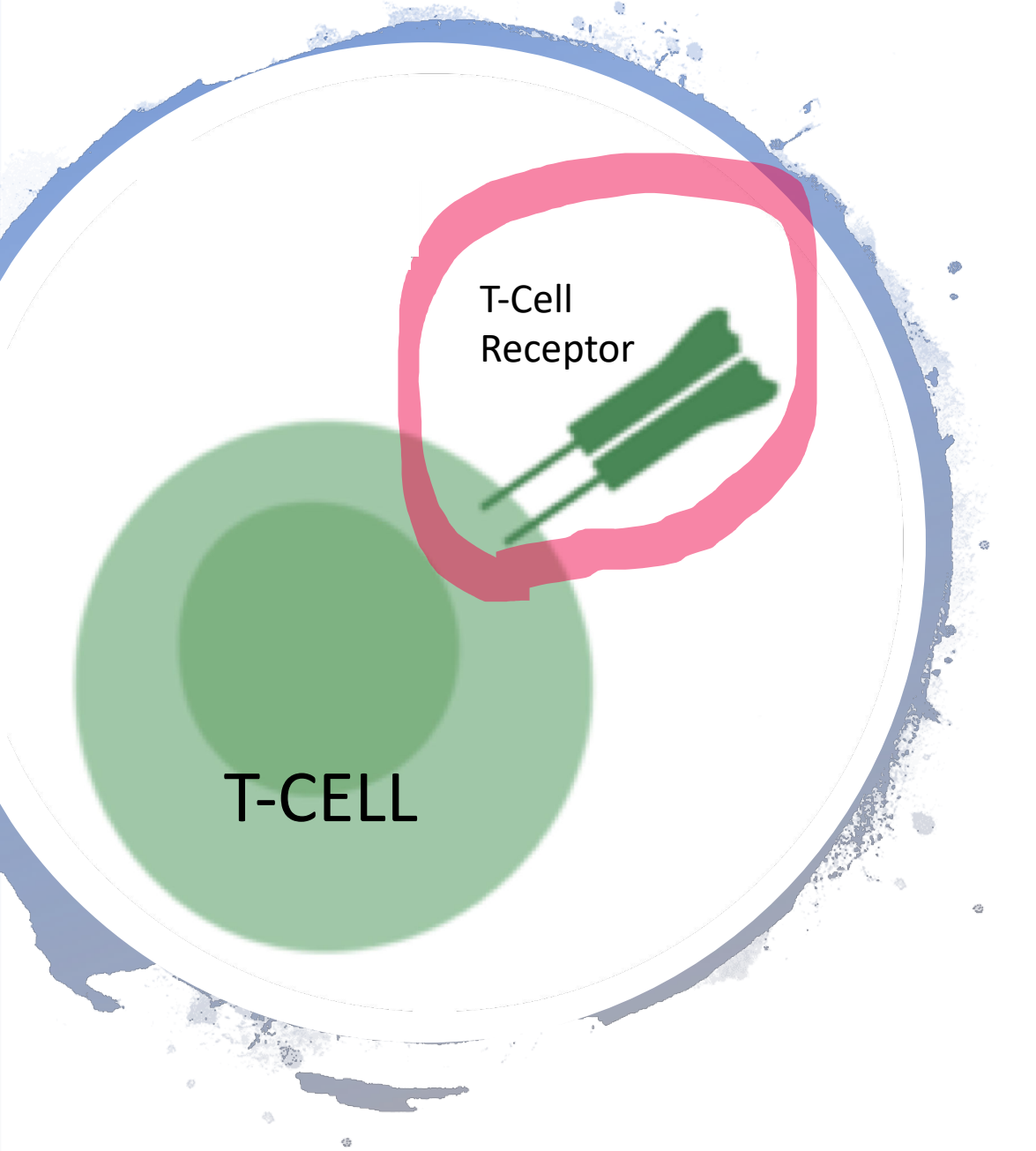
These Car T-Cells will identify the patient's cancer and destroy the cancer's cells

T-Cells are a type of white blood cell that is of key importance to the immune system

The immune system creates an army of T-Cells to patrol our body

The T-Cell's job is to find diseased cells and destroy them

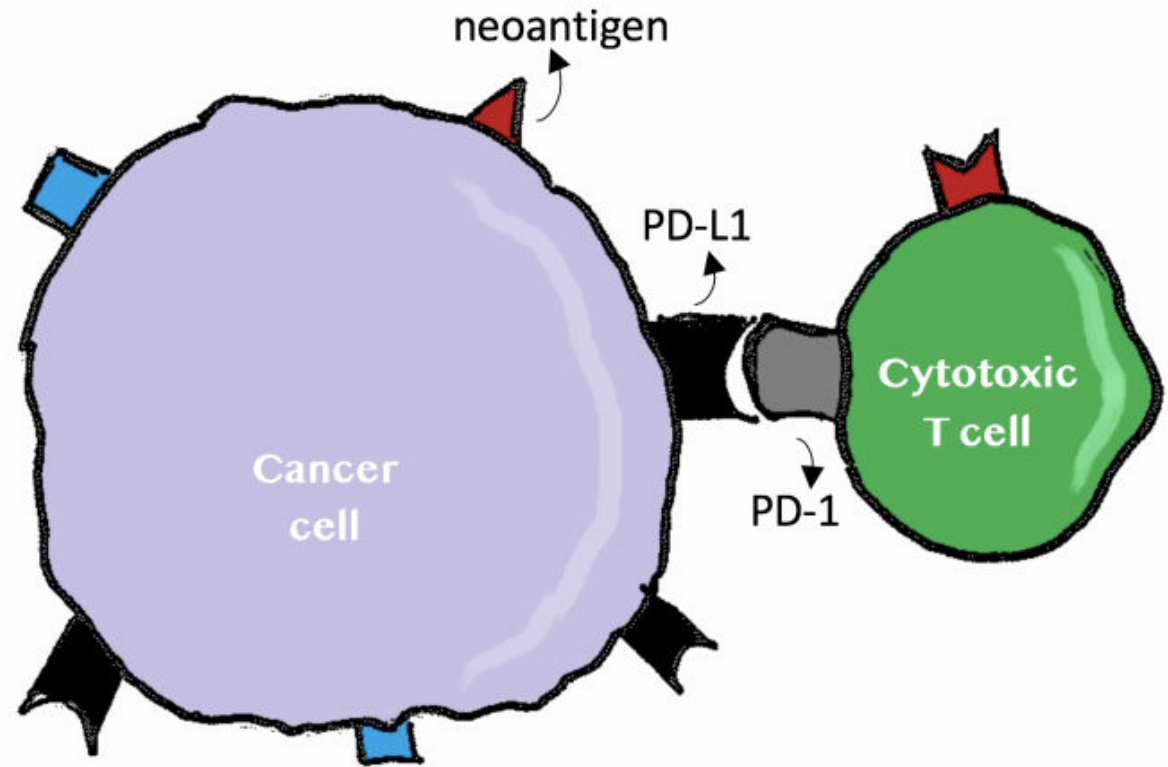
What are T-Cells?



How Do T-Cells Destroy Diseased Cells?

- **T-Cells** have protein receptors on their surface
- **T-Cells** locks on to diseased cells and releases toxic chemicals through the receptor into the diseased cell
- **T-Cells** recruit other **T-Cells** to the area of the diseased cell

Normal T-Cell Locking onto Cancer Cell and Injecting Toxins into the Cancer Cell



Why Do We Modify the Patients T-Cells ?

Immunosuppression

Diseased Cells have protection mechanisms:

Diseased cells can disguise themselves so T-Cells cannot identify them

Diseased cells create many antigens on their surface so the T-Cells cannot “lock on”

Diseased cells turn off the immune systems response to them

Car T-Cells can
overcome
Immunosuppression
better than normal
T-Cells

Engineered CAR T-Cells are more
resistant to immune suppression

CAR T-Cells contain switchable receptors
to circumvent immunosuppression

Regional Injections to Solid Tumors can
help to minimize immunosuppression

How Do We Modify a Normal T-Cell into a CAR T-Cell?

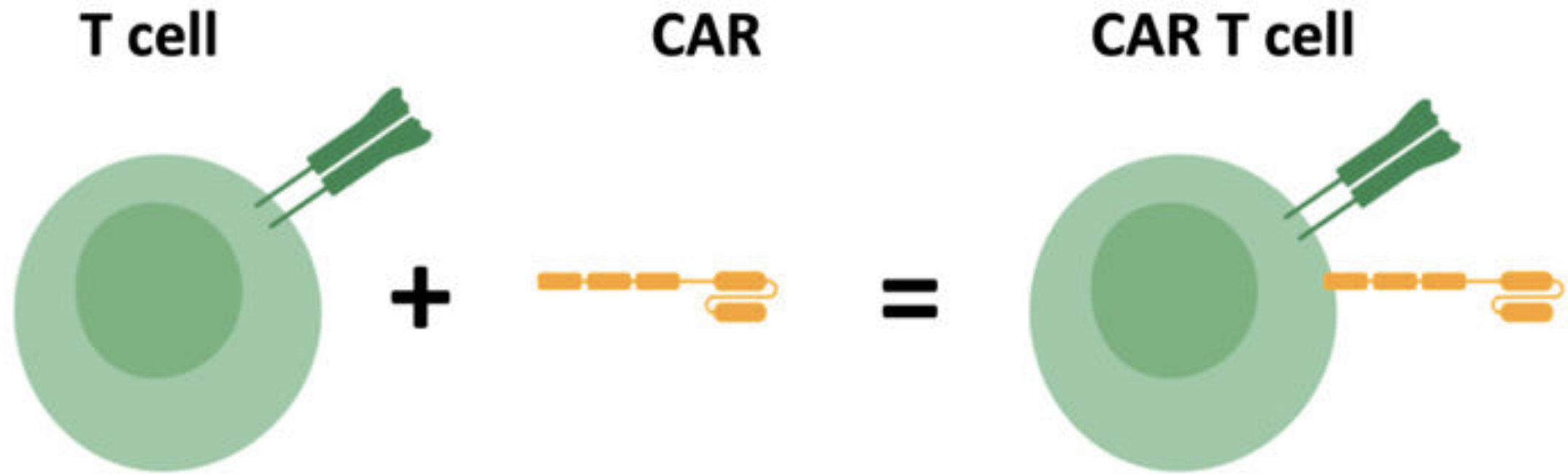
The white blood cells including T-Cells are separated out of the blood

An Inactive Virus is used to insert special genes into the T-Cell

The new genes cause the T-Cell to create new receptors called CAR

The new receptors on the CAR T-Cell are attracted to targets on the cancer cells

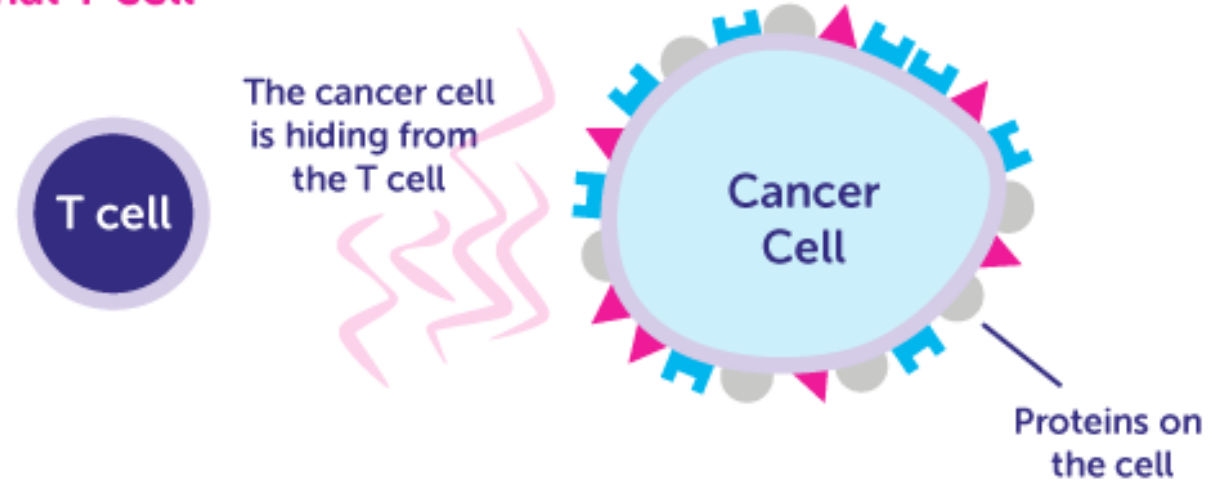
These new modified T-Cells now called Car T-Cells and are then expanded to millions to create a therapeutic dose



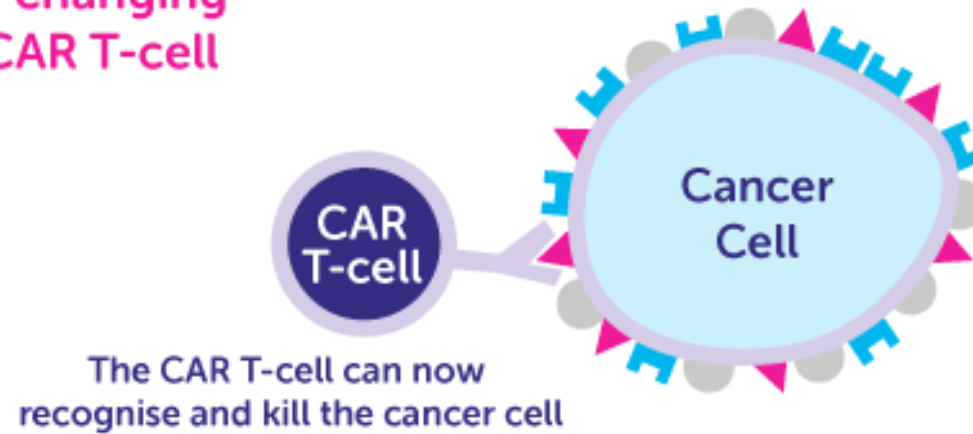
Normal T-Cell Modified into Car T-Cell

Car T-Cell Therapy
changes a
Normal T-Cell into a
Car T-Cell that is
better able to
target cancer

1. Normal T cell



2. After changing into a CAR T-cell



CAR T-Cells for Multiple Myeloma

- Multiple Myeloma (MM) is a type of blood cancer that affects plasma cells. When MM occurs, healthy plasma cells transform into malignant plasma cells (myeloma cells). Currently there is no effective cure for the MM.
- B Cell Maturation Antigen (BCMA) is expressed only in mature B cells and plasma cells, and over-expressed in myeloma cells, which is an ultimate target for treatment.



Research Targeting Multiple Myeloma

19 Patients in the Study

Positive Results

- | | |
|-------------------------------|------------|
| • Stringent Complete Response | 7 patients |
| • Complete Response | 1 patient |
| • Very Good Partial Response. | 3 patients |
| • Partial response | 6 patients |
| • Stable Disease | 2 patients |

What are the possible side effects of CAR T-Cell therapy?

Acquest uses 2nd generation Car T-Cell Technology. This technology limits the side effects. The most common side effects seen are:

- Similar to flu-like symptoms
- Headache
- Fever
- Chills
- Muscle or joint pain

Patient Selection Criteria for Multiple Myeloma

Patients Age:18-70

Patient must not be pregnant and should take contraceptive measures during the treatment and for 3 months after the treatment

BCMA positive as confirmed by Flow Cytometry or IHC

No Autoimmune diseases patients

No Immunodeficiencies, patients with HIV infection

No Patients with severe infectious disease

No Patients undertaking or undertook organ transplants within 3 months

No Patients with active hepatitis B or C

No Patients under systematical administration of glucocorticoids within 4 week before treatment

No Severe allergic symptoms

No Patients with psychological disorders

Multiple Myeloma Patient Treatment Plan

Day 1 Evaluation

Day 2 Blood Collection

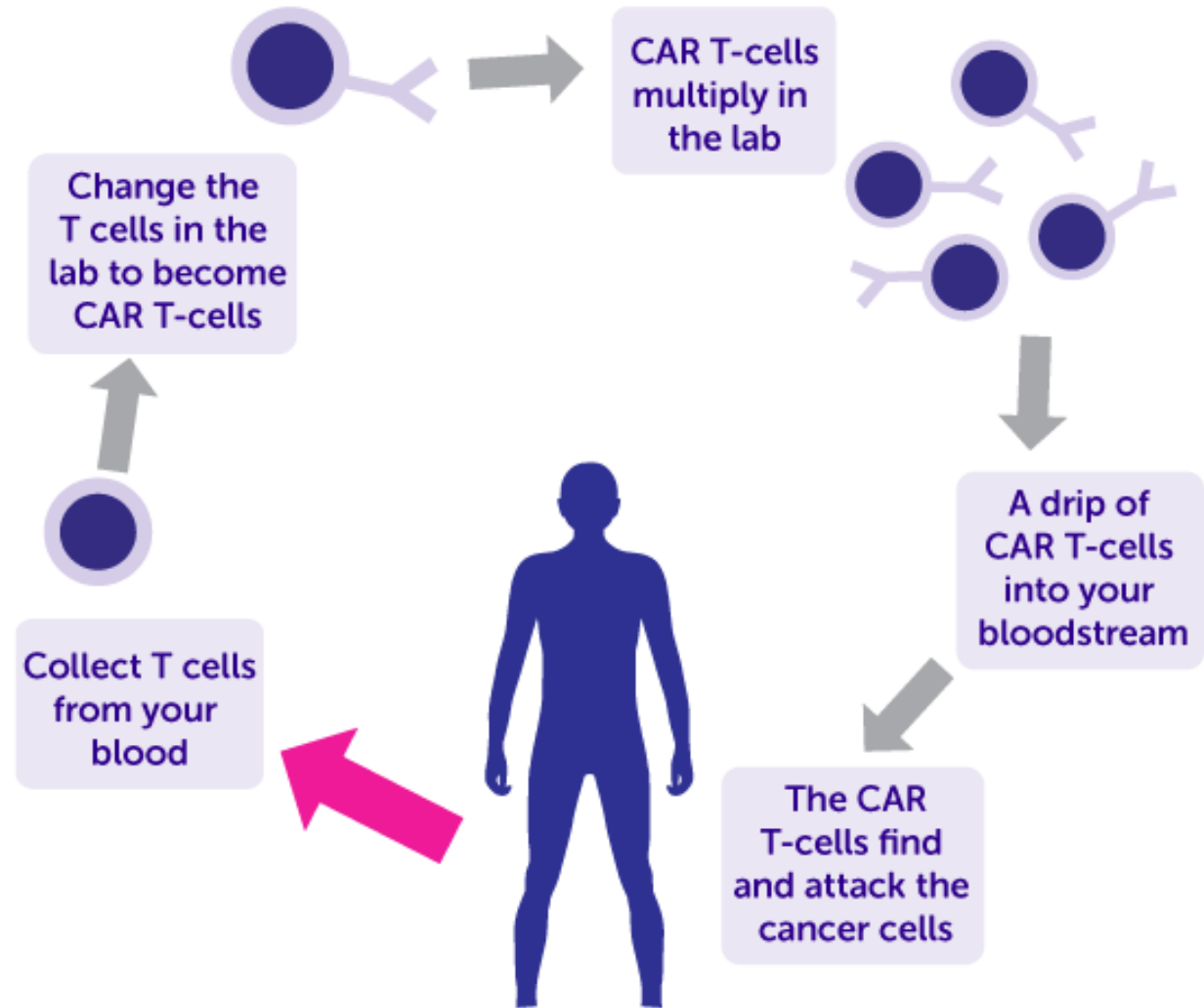
Day 3 – 14 Supportive Therapies

Day 15 – CAR T-Cell Infusion

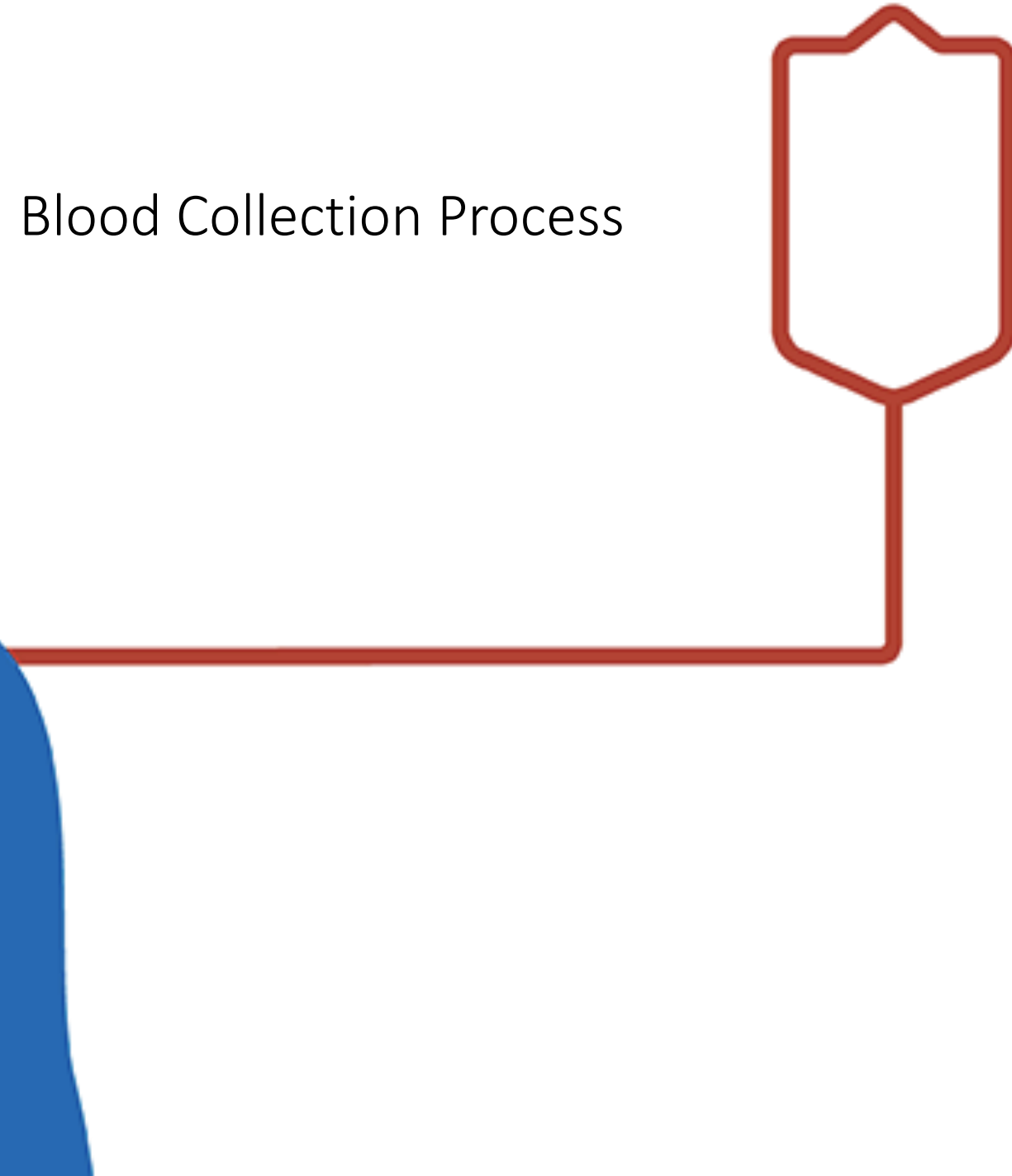
Day 15 – 28 Patient under Observation in
Hospital

Follow-up according to Physician

The CAR T-Cell Patient Process



Blood Collection Process



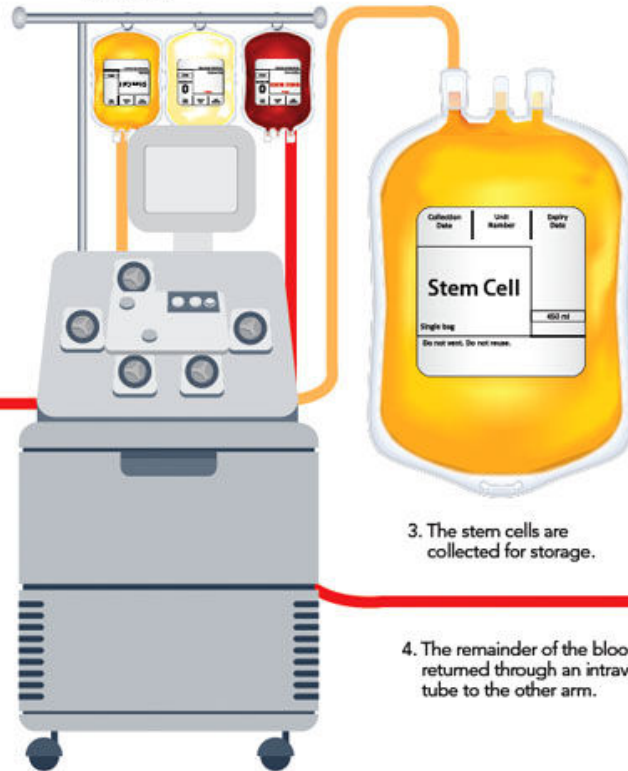
T-Cells are removed from the patient's blood using a procedure called **leukapheresis**.

Two IV lines are needed because blood is removed through one IV, and then is returned to the body through the other.

The Procedure takes 2 to 3 hours.

Apheresis Process

1. Your whole blood is collected through an intravenous tube in one arm.



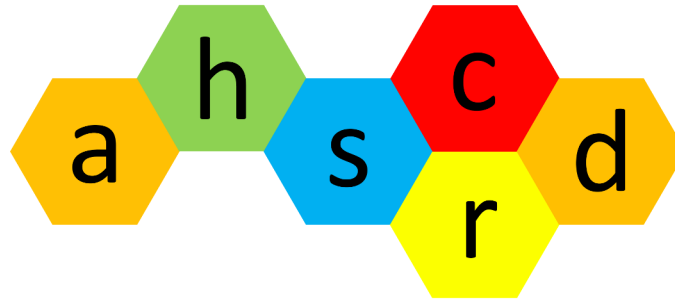
2. The blood passes through an apheresis machine, which separated the stem cells from the blood.

3. The stem cells are collected for storage.

4. The remainder of the blood is returned through an intravenous tube to the other arm.

Benefits of CAR T-Cell Therapy for Multiple Myeloma Patients

- Safety (over 100 Patients Treated Successfully)
- No Dramatic Side Effects (2nd Generation Technology)
- Generally One Month Treatment Regimen
- Overall Positive Response of 89%
- Long-term Immune Boosting Effect
- No Chemotherapy
- Patients Own Blood Used in the Treatment



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