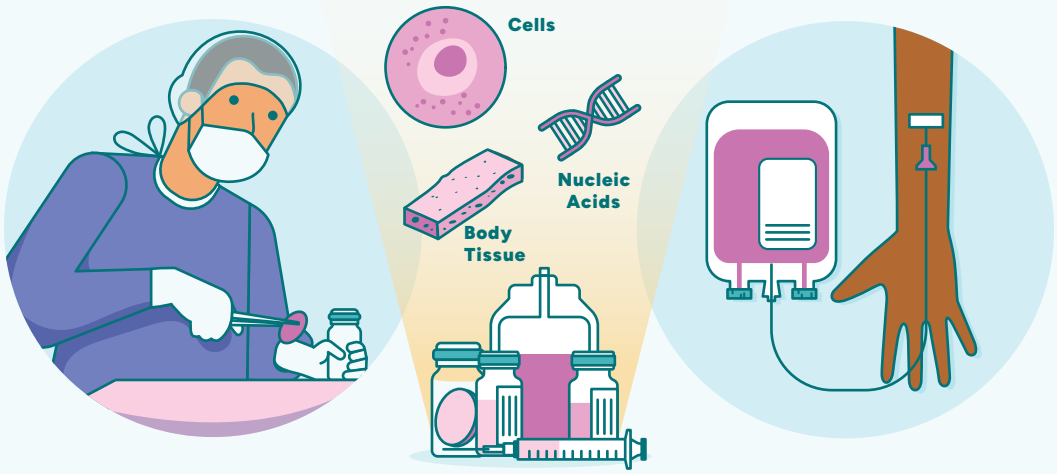
WHAT ARE CELL, TISSUE, AND GENE THERAPIES?

ACE agency for care effectiveness

Cell, tissue, and gene therapy products are made from human or animal cells or tissues, or man-made genetic material. They are used to diagnose, treat, or prevent different conditions[1] including **burns, cancers,** and **genetic disorders.** Without treatment, many of these conditions could lead to severe disability or death.



MORE ABOUT CELLS, TISSUES, AND GENES

CELLS

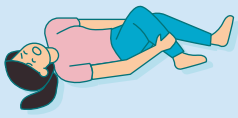
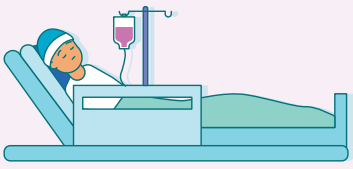
Cells are the basic **building blocks** that make up the tissues and organs in our bodies. They keep the body **functioning properly,** by providing structure and carrying out chemical reactions.

TISSUES

Tissues are **groups** of similar cells that work together to carry out **specific functions** in our bodies, such as making our skin strong or helping us to move our limbs.

GENES

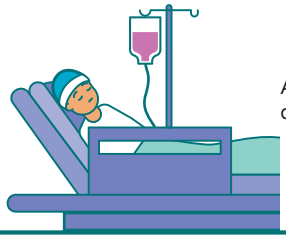
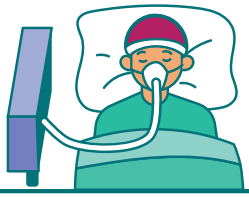
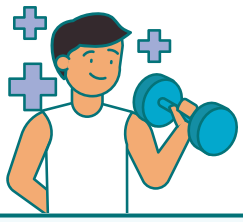
Genes are like an **instruction** manual for our bodies. They tell our cells what to do and how to work. Sometimes, genes can have **mistakes** or **mutations** that make us sick or stop our body from functioning properly.

Tissue therapy	Cell therapy New	Gene therapy New
		
Tissues from a donor or that are grown in a laboratory are used during **surgery** to repair or replace damaged areas of the body (e.g. a bone graft).	Cells from the patient (autologous cells) or a donor (allogeneic cells) are processed in a laboratory and then placed back into the patient to **heal** damaged areas of the body or act as a treatment to find and **kill** cancer cells. Common conditions treated with cell therapies include cancers of the blood and bone marrow, cancers of the lymphatic system, plasma cell disorders, and other conditions that affect the body's ability to make healthy cells.	Genetic material (recombinant nucleic acids) is delivered into the patient's cells to **replace, inactivate,** or **correct** the function of **missing** or **abnormal** genes. Gene therapies can treat genetic or inheritable disorders, and certain types of cancer.

Some treatments are a **combination** of cell and gene therapies. This occurs when a patient's cells are **removed**, then the genes in the cells are **modified** before the cells are **put back** into the patient. If the therapy is successful, the body will **continue** to produce more cells with the **same** genetic modification. An example of this type of treatment is chimeric antigen receptor T-cell therapy (**CAR-T**).[2,3,4,5,6]

IMPORTANT CONSIDERATIONS

New cell and gene therapies can help to **slow** or **reverse** the progression of difficult-to-treat health conditions for **certain** patients.[1] However, they can be **very high cost** and **may not work** for all patients. Some can also have **serious** side effects. The long-term benefits of these treatments are also uncertain, but clinical studies are **ongoing**.

Potential Benefits	Potential Risks
 An **option** for patients with difficult-to-treat conditions	 May not work for **all** patients with the condition
 Most of them are **one-time** treatments	 **Long** waiting time as some therapies take around **4 weeks or more** before they are ready for use
 May **slow** or **reverse** the progression of the condition	 May have **serious** side effects such as organ damage or excessive immune response
 May **reduce** reliance on lifelong treatments	 Can be very expensive
 Treatment effects may be **long-lasting**	 Treatment effects may **wane** over time
 Reduced risk of health **complications** from the condition	 Possible risk of **long-term** side effects from treatment

APPROVED CELL AND GENE THERAPIES IN SINGAPORE

Some cell and gene therapies are already **available** in Singapore for different conditions:[7]

Health conditions	Approved for treating
Blood cancers	Certain types of leukaemia, lymphoma, and myeloma
Injuries	Damaged soft tissue at the ends of bones (articular cartilage) in the knee
Genetic disorders	• Haemophilia B • Retinal dystrophy • Spinal muscular atrophy (SMA)



SUBSIDISED CELL AND GENE THERAPIES

The Ministry of Health (MOH) has published a list of cell, tissue, and gene therapy products (**CTGTPs**) that are clinically effective and considered to be an acceptable use of healthcare resources.

Treatments on the **CTGTP List** are subsidised for patients who meet certain **clinical criteria** as assessed by their doctor. The amount of subsidy received is determined by **means-testing**. More subsidy is given to patients from low-income households. You can visit the **MOH CTGTP webpage** to find out the subsidy levels for different therapies.[8]

Eligibility:

- Singaporeans and permanent residents
- who are subsidised patients, and
- receiving treatment at a public healthcare institution

Up to 75% subsidy, capped at $150,000 for Singaporeans

Up to 22.5% subsidy, capped at $45,000 for Permanent Residents

Costs for these treatments are claimable from **MediShield Life** and patients can withdraw from **MediSave**.[9]

KEY MESSAGES

Cell and gene therapies are **promising** new treatments for health conditions that are difficult to treat. However, they may not work for all patients and can have serious side effects.

Discuss with your **doctor** if these therapies are suitable for you, and your concerns. You can also speak to a **medical social worker** if you need further financial assistance for any therapies.



Sources

1. www.hsa.gov.sg/ctgtp/regulatory-overview
2. ACE technology guidance on *Tisagenlecleucel for relapsed or refractory B-cell acute lymphoblastic leukaemia*, 2024
3. ACE technology guidance on *Tisagenlecleucel for relapsed or refractory diffuse large B-cell lymphoma after two or more lines of systemic therapy*, 2025
4. ACE technology guidance on *Axicabtagene ciloleucel for second-line relapsed or refractory large B-cell lymphoma*, 2025
5. ACE technology guidance on *Axicabtagene ciloleucel for relapsed or refractory large B-cell lymphoma after two or more lines of systemic therapy*, 2025
6. ACE technology guidance on *Equecabtagene autoleucel for relapsed or refractory multiple myeloma*, 2026
7. https://share.hsa.gov.sg/mop/ApprovedProducts
8. Ministry of Health (MOH), Singapore, *Subsidies for Cell, Tissue and Gene Therapy Products at Public Healthcare Institutions*, October 2024
9. Ministry of Health (MOH), Singapore, *MediShield Life Benefits*, June 2026

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