CONDITION

Graft-versus-host disease

Graft-versus-host disease is a complication in which donated immune cells attack the recipient's tissues after a transplant.

WHAT IT IS
Immune complication after a donor cell or marrow transplant

BODY SYSTEM
Skin, digestive system, liver, eyes, mouth, and lungs

MAIN SYMPTOMS
Skin rash, watery diarrhea, jaundice, dry eyes or mouth

WHAT CAUSES IT
Donor immune cells attacking recipient tissues

HOW IT IS DIAGNOSED
Clinical assessment, blood tests, and sometimes tissue biopsy

MAIN TREATMENT
Immune-suppressing medicines and organ-specific supportive care

CAN IT BE CURED?
Sometimes - immune tolerance can develop

IS IT AN EMERGENCY?
Sometimes - severe diarrhea, breathing trouble, or rapid decline

LONG-TERM OUTLOOK
Many improve, but some develop lasting organ problems

Overview

Graft-versus-host disease, usually shortened to GVHD, is a possible complication of an allogeneic stem cell transplant. In this type of transplant, blood-forming stem cells come from another person. It may be called a bone marrow, blood stem cell, or cord blood transplant.

The transplant replaces unhealthy or damaged blood-forming cells. It can be used to treat blood cancers, bone marrow failure, immune conditions, and some inherited disorders.

GVHD happens when immune cells from the donor recognize the recipient's tissues as foreign and attack them. The skin, digestive tract, and liver are often affected. Long-lasting GVHD can also involve the mouth, eyes, lungs, joints, muscles, and genital area.

GVHD is grouped into acute and chronic forms. Acute GVHD often develops in the first weeks

or months after transplant. Chronic GVHD usually begins later and can continue for months or years. Timing alone does not define the type: doctors also use the pattern of symptoms and organ changes. Some people have features of both.

Not everyone who has a donor transplant develops GVHD. When it does occur, the effects range from mild and limited to severe. Early recognition matters because treatment may reduce tissue damage and help protect organ function.

Symptoms

Symptoms depend on whether GVHD is acute or chronic and which organs are involved. New symptoms after transplant do not always mean GVHD. Infections, medicines, and other transplant complications can cause similar problems.

Acute GVHD commonly affects the skin, digestive tract, and liver. Possible symptoms include:

Chronic GVHD can affect more parts of the body. Symptoms may include dry, gritty, painful, or light-sensitive eyes. The mouth may feel dry or sore, and foods may taste different. White patches, ulcers, sensitivity to spicy foods, or difficulty opening the mouth can occur.

Skin may become itchy, discolored, thickened, tight, or less flexible. Hair loss and brittle or ridged nails are possible. Tight skin or inflammation around joints can reduce movement.

Lung involvement may cause a dry cough, wheezing, breathlessness, or a gradual loss of stamina. Genital GVHD can cause dryness, burning, pain, narrowing, or discomfort during sex. Some people also develop muscle weakness, weight loss, or ongoing tiredness.

- A red or darkened rash, often beginning on the palms, soles, face, ears, or upper body
- Itching, tenderness, blistering, or peeling skin
- Nausea, vomiting, loss of appetite, or stomach cramps
- Frequent or watery diarrhea, sometimes with blood
- Yellow skin or eyes, dark urine, or abnormal liver blood tests

Causes and risk factors

GVHD begins with immune cells in the donated graft, especially white blood cells called T cells. These cells can identify the recipient's tissues as different and start an inflammatory attack.

Human leukocyte antigens, or HLA markers, help the immune system tell the body's own cells from foreign cells. Careful HLA matching lowers the risk, but GVHD can still happen after a

closely matched or related-donor transplant.

Risk is influenced by several factors, including:

GVHD is different from organ rejection. In rejection, the recipient's immune system attacks the donated organ or cells. In GVHD, immune cells from the donor attack the recipient.

A rare form called transfusion-associated GVHD can follow transfusion of blood containing viable donor immune cells. It is mainly prevented by irradiating blood products for people known to be at risk.

- How closely the donor and recipient are HLA matched
- The source and processing of the donated cells
- Differences in donor and recipient age, sex, or immune history
- The transplant conditioning treatment used beforehand
- The medicines or cell-based methods used to prevent GVHD
- Previous acute GVHD, which can raise the likelihood of chronic GVHD

Diagnosis

There is no single blood test that confirms every case of GVHD. Diagnosis begins with your symptoms, examination findings, transplant history, and the timing and pattern of organ changes.

Blood tests can check liver function, blood cell counts, inflammation, nutrition, and signs of infection. Stool testing may be needed when diarrhea is present. Breathing tests and chest imaging can assess possible lung involvement. Eye, mouth, skin, liver, or genital examinations may be arranged depending on symptoms.

A biopsy may help confirm the diagnosis or rule out another cause. During a biopsy, a small tissue sample is removed and examined under a microscope. Samples may come from the skin, digestive tract, liver, mouth, or another affected area.

Biopsy findings are interpreted with the overall clinical picture. Medicines, viral infections, bacterial infections, and other transplant complications can resemble GVHD.

Doctors grade acute GVHD according to the organs affected and the severity of those effects. Chronic GVHD is usually classified as mild, moderate, or severe. These assessments help guide treatment and provide a baseline for tracking improvement.

Treatment and management

Treatment aims to control the donor immune response while preserving the transplant's beneficial effects. It also aims to relieve symptoms, prevent permanent organ damage, and reduce complications.

Mild GVHD limited to one area may sometimes be treated locally. Examples include medicated skin creams, eye drops, mouth rinses, or treatments applied to the genital area. These treatments still require transplant-team supervision because symptoms can spread or signal deeper organ involvement.

More extensive GVHD usually requires systemic treatment, meaning medicine that works throughout the body. Corticosteroids like prednisone or hydrocortisone are commonly used as initial treatment. Other immune-suppressing medicines may be added when GVHD is severe, does not respond enough, returns during steroid reduction, or causes unacceptable treatment effects.

Options can include targeted immune medicines and extracorporeal photopheresis. In photopheresis, some white blood cells are collected, exposed to a light-activated medicine, and returned to the bloodstream. The most suitable approach is based on the type of GVHD, organs involved, previous treatment, infection risk, and overall health.

Supportive care is an important part of treatment. It may include:

Immune-suppressing treatment increases vulnerability to infection. Your transplant team may arrange infection-prevention medicines, vaccinations, blood tests, and other monitoring. Do not stop immune-suppressing medicine suddenly unless the transplant team directs you to do so.

- Fluids and nutrition support for digestive symptoms or weight loss
- Skin care and protection from sun exposure
- Lubricating eye treatments and specialist eye care
- Dental and mouth care
- Physical therapy and stretching for stiffness or weakness
- Lung rehabilitation or inhaled treatment when appropriate
- Treatment to protect bones during prolonged corticosteroid use

Complications

GVHD may damage affected tissues or cause scarring. Chronic lung GVHD can narrow the

small airways, while skin and joint changes can limit movement. Eye damage may affect the surface of the eye and, in severe cases, vision. Long-term mouth inflammation can contribute to dental problems and makes regular oral checks important.

Digestive involvement can lead to dehydration, poor nutrient absorption, and weight loss. Liver involvement may reduce liver function. Genital scarring can cause pain or narrowing.

Both GVHD and its treatment can weaken immune defenses. This raises the risk of bacterial, viral, and fungal infections. Prolonged corticosteroid treatment may also contribute to bone thinning, muscle weakness, high blood sugar, mood changes, cataracts, or other health problems.

Chronic inflammation, reduced mobility, sleep disruption, and demanding treatment routines can affect energy, work, relationships, and emotional health. Rehabilitation, nutritional support, pain care, and mental health support may all form part of recovery.

Prevention

GVHD cannot always be prevented. Some donor immune activity is also linked to the graft-versus-tumor effect, in which donor cells help attack remaining cancer cells. Transplant teams therefore balance GVHD prevention against other treatment goals.

Before transplant, donor and recipient HLA markers are compared. The transplant plan may also use immune-suppressing medicines, removal or modification of certain donor cells, or medicines given shortly after transplant to reduce GVHD risk.

Take preventive medicines exactly as directed and tell the transplant team if vomiting, swallowing problems, or missed doses make this difficult. Avoiding infections does not directly prevent GVHD, but it is especially important while the immune system is suppressed.

For people at risk of transfusion-associated GVHD, specially irradiated blood products prevent donor immune cells from multiplying. This is handled by the hospital and blood bank.

Living with it and what to expect

Acute GVHD may improve with treatment over weeks or months. Some cases resolve, while others return as immune-suppressing treatment is reduced or develop features of chronic GVHD.

Chronic GVHD often follows an uneven course. Symptoms may improve, remain stable, or flare. Treatment can continue for months or years and is usually reduced gradually when the

condition is controlled. Some people eventually stop immune-suppressing treatment. Others need ongoing treatment or support for lasting organ changes.

Regular follow-up may include blood tests, skin and mouth checks, eye examinations, lung-function tests, bone health assessments, and reviews of infection risk. Report changes early rather than waiting for the next scheduled visit.

Most daily activities can be adjusted around energy levels and infection precautions. Gentle activity and prescribed stretching can help maintain strength and joint movement. Dry-eye care, mouth care, skin moisturising, and nutrition support may reduce day-to-day symptoms.

GVHD can be emotionally tiring, especially when recovery takes longer than expected. Practical help, counselling, peer support, and transplant rehabilitation may make long-term treatment easier to manage.

When to get medical help

Contact your transplant team promptly about any new rash, diarrhea, vomiting, jaundice, mouth soreness, eye discomfort, cough, breathlessness, genital pain, reduced joint movement, or unexpected weight loss. Prompt contact is also important if known GVHD worsens or if prescribed medicines cannot be taken.

Seek urgent medical advice for frequent watery diarrhea, inability to keep fluids down, rapidly spreading rash, new yellowing of the skin or eyes, worsening breathlessness, or signs of infection such as fever or shaking chills. Follow the specific fever plan given by your transplant centre.

Seek emergency care for severe difficulty breathing, chest pain, fainting, confusion, uncontrolled bleeding, severe dehydration, or widespread blistering or peeling skin. If possible, tell emergency staff that you have had an allogeneic stem cell transplant and may be taking immune-suppressing medicines.

Routine follow-up remains important even when symptoms are stable. Some lung, eye, liver, or mouth changes can develop gradually and may be found during monitoring.

Common questions

Is graft-versus-host disease cancer?

No. GVHD is an immune complication of a donor transplant, not cancer. It may occur in people whose transplant was used to treat cancer or a non-cancerous condition.

Does GVHD mean my transplant has failed?

Not necessarily. GVHD can occur even when donor stem cells have successfully settled in the bone marrow and are producing blood cells. Its presence does not by itself show whether the original condition has returned.

Can graft-versus-host disease go away completely?

Sometimes. Acute GVHD may resolve, and chronic GVHD may become inactive as the donor immune system develops greater tolerance. Some people are left with dryness, scarring, stiffness, or reduced organ function even after active inflammation has stopped.

Is GVHD contagious?

No. You cannot catch GVHD from another person or pass it to family members. However, GVHD treatment can weaken immune defenses, so avoiding exposure to infections may be important.

Can GVHD come back after treatment?

Yes. Symptoms may return while immune-suppressing medicine is being reduced or after treatment has stopped. A recurrence does not mean that nothing can be done, but it needs prompt assessment because infection and other problems can look similar.

What is the difference between acute and chronic GVHD?

The difference is based mainly on the pattern of organ involvement, not simply the number of days since transplant. Acute GVHD usually causes rash, diarrhea, or liver inflammation. Chronic GVHD can resemble autoimmune conditions and may cause dryness, scarring, stiffness, or lung changes.

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