Children's Cancer and Leukaemia Group | the EXPERTS in CHILDHOOD CANCER

Graft versus host disease (GvHD) in children and young people

An information guide for patients, parents and carers

The purpose of this guide is to help you understand more about graft versus host disease (GvHD) in children and young people with cancer.

Information in this guide should be used to support professional advice specific to your/your child's diagnosis. If you have any questions, it is important to ask your medical team.

What is graft versus host disease (GvHD)?

Graft versus host disease (GvHD) is a complication of stem cell transplantation (STC) where stem cells are donated from another person (allogeneic transplant). GvHD can happen whether the donor stem cells come from bone marrow, peripheral blood or umbilical cord blood.

The 'graft' refers to the donor cells and the 'host' is the person having the transplant. GvHD happens when the T-cells (a type of white blood cell that attacks foreign bodies such as bacteria) from the donor fight the patient's own organs, which affects their ability to work properly. This happens because the donated cells (the graft) see your/your child's body cells (the host) as foreign, and start to attack.

Who gets GvHD?

It is difficult to predict exactly who will get GvHD and to what extent. When donors are matched to patients, whether family members or not, the work done in the laboratory aims to provide the best match possible. This work also tries to predict the risk of GvHD. Many patients will develop GvHD. It is usually mild and can be treated, but sometimes it can be serious.

Where can GvHD occur?

GvHD can occur in any body part, and more than one part can be affected. The most common sites are the skin, the gut (gastro-intestinal tract) and the liver.

Types of GvHD

There are two types of GvHD. This factsheet will describe each of these separately.

- acute (aGvHD)
- chronic (cGvHD)

Grades of GvHD

GvHD is measured in the following four grades:

- Grade 1 (mild)
- Grade 2 (moderate)
- Grade 3 (severe)
- Grade 4 (most severe)

Acute GvHD (aGvHD)

Acute GvHD (aGvHD) is most common in the early post-transplant period. It can affect several parts of the body such as the skin, liver and gut.

aGvHD of the skin

Skin aGvHD usually starts with a rash. It may be more obvious at certain times of the day. The rash may spread, come and go, or disappear. It often starts on the palms of the hands and soles of the feet. The hands and feet can become sensitive. The skin can become itchy.

Diagnosing aGvHD of the skin

Often aGvHD of the skin can be diagnosed by looking at the rash. Sometimes your team will ask a dermatologist (skin doctor) for advice, especially to rule out drug reactions or infections. A skin biopsy may be needed to confirm the diagnosis. This involves collecting a small sample of tissue to be examined in the laboratory.

Treating aGvHD of the skin

Mild to moderate aGvHD means the rash may cover up to 50% of the skin surface. Treatment usually involves special moisturising creams (emollients), medication to control the itching and/or steroid cream. It may also be necessary to give low doses of steroids by mouth.

Moderate to very severe aGvHD means the rash covers more than 50% of the skin surface. It is treated with a combination of intravenous steroid infusions, steroid creams and emollient creams.

How you can help

Your/your child's skin may feel uncomfortable and sensitive. To help this you/your child should:

- wear loose cotton clothing and use cotton bed linen
- avoid highly perfumed washing powders and toiletries
- avoid getting hot and sweaty
- use mild/non-perfumed soaps or emollient bath oils
- avoid very hot showers or baths
- pat instead of rubbing the skin dry after washing
- keep skin well moisturised with emollient creams

aGvHD of the gut

aGvHD of the gut usually starts with diarrhoea, feeling sick (nausea) and tummy pain. As these symptoms can be caused by radiotherapy, chemotherapy, antibiotics or infection, a specific diagnosis is sometimes difficult.

Small to large amounts of diarrhoea may be passed several times a day. Often the diarrhoea is watery and green. Sometimes small amounts of blood are found in the diarrhoea. This is caused by the aGvHD inflaming the bowel lining and making it delicate. You/your child may have stomach cramps and pain and sometimes nausea and vomiting. Attempting to eat can make symptoms feel worse, so a loss of appetite is common.

Diagnosing aGvHD of the gut

A diagnosis may be made from the symptoms and type of diarrhoea you/your child has. Your team may also ask a specialist stomach doctor (gastroenterologist) to assess you/your child. The gastroenterologist may use a small camera to look at the inside of the bowel (a procedure called an endoscopy) and take a biopsy of the bowel wall. This can help find the cause of the symptoms and confirm whether it is aGvHD or an infection.

Treating aGvHD of the gut

Grades 1-2 (mild to moderate) is treated with low dose steroids (anti-inflammatory drugs) given by mouth or through a drip. Intravenous fluids may be required if the diarrhoea causes dehydration. Painkillers for tummy cramps and anti-sickness drugs may also be given.

Grades 3-4 (severe to most severe) will include the above treatments plus higher dose steroids through a drip and/or other immunosuppressive drugs.

Sometimes with aGvHD the bowel will not tolerate food, so you/your child may not be able to eat and not feel like eating. In this case, feeding support may be given in one or two of the following ways:

- naso-gastric (NG) feeding – a tube is passed through the nose into the stomach. This is done while you/your child is awake. Liquid food is given directly into the stomach via the tube.
- gastrostomy PEG – a feeding tube is inserted through the abdominal wall into the stomach. This is done under a general anaesthetic and would normally be planned before transplant. This can be left in place for longer than an NG tube.
- parenteral nutrition (PN) – nutrition is given directly into the bloodstream via the central line. This is used if diarrhoea and vomiting are severe and the gut needs to rest by having nothing to eat or drink.

How you can help

- maintain good personal hygiene
- keep your/your child's bottom clean and dry

- use barrier creams around your/your child's bottom to prevent skin soreness and damage
- expose any sore area to fresh air as much as possible
- take pain relief for tummy ache
- take anti-sickness drugs to help nausea and vomiting
- be aware that nurses will need to check your/your child's bottom for broken, damaged or infected skin
- carers should wear disposable gloves when dealing with diarrhoea and thoroughly wash hands afterwards

aGvHD of the liver

aGvHD of the liver affects the small ducts (tubes) that allow bile to flow out of the liver. These ducts become inflamed leading to mild, moderate or severe damage. Early signs of aGvHD of the liver may only show up as slightly abnormal liver function blood tests. If acute liver aGvHD progresses, other symptoms may include:

- jaundice (skin and eyes look yellow and urine is dark)
- itchy skin caused by the jaundice
- swollen stomach
- some discomfort or pain
- problems with blood clotting

Diagnosing aGvHD of the liver

Your team will monitor blood tests to see how well the liver is working. If results show that aGvHD of the liver may be occurring, a specialist liver doctor (hepatologist) may assess you. Sometimes a liver scan is done and very occasionally a liver biopsy may be needed.

Treating aGvHD of the liver

Treatment may include the following:

- low or high dose steroids or immunosuppressive drugs
- medication to help stop itching
- painkillers
- blood products, such as blood or platelet transfusions
- medication to improve blood clotting

Chronic GvHD (cGvHD)

Chronic GvHD (cGvHD) can affect any organ or system and can appear anytime after transplant. The commonly affected areas are the skin, mouth, liver and eyes. It can also affect the lungs, tummy (gastrointestinal tract), muscles and joints. The table overleaf shows the most common symptoms.

cGvHD is classified according to severity and can:

- continue on from aGvHD
- start again after aGvHD has settled
- develop if there has been no aGvHD

Diagnosing and treating cGvHD

Your SCT team will investigate any signs and symptoms that occur. It is important to remember that there can be other causes for these, such as drug reactions, infection or even having dry eyes from total body irradiation (TBI). Treatment for cGvHD usually means continuing with ciclosporin or similar drugs such as tacrolimus, and often includes steroids. Your SCT team will explain how you/your child will be treated if cGvHD develops.

The effect of cGvHD on bone marrow function

Chronic GvHD, and the immunosuppressive drug treatment used to treat it, means that you/your child will have an increased risk of infections. Your SCT team will give you information on how to prevent infection. You/your child will continue on preventative anti-infective medications to reduce the risk of infections. At a later date your team will talk to you about re-immunisation.

Treatment used to prevent, reduce or treat GvHD

Many people have done a lot of work to select the best donor match for your/your child's transplant. During and after transplant, drugs are used to prevent or reduce GvHD and to treat it if it occurs. These drugs help control the donor's T-cell activity. The goal is to suppress the immune system without compromising the donor cells.

The main medications used to prevent GvHD are called immunosuppressive drugs, in particular a drug called ciclosporin. Treating GvHD can be complex and require a combination of therapies. Treatment can be difficult and may take a long time, but it is very important for recovery. The treatment plan will be specific to your/your child's needs. Your team will discuss this with you fully.

ExtraCorporeal photopheresis (ECP)

Your doctor might recommend ExtraCorporeal photopheresis (ECP) treatment. This may become an option if the combination of medication has not worked or it has not been possible to reduce steroid doses. ECP can work in combination with other immunosuppression treatment and, if effective, steroid doses can be reduced. Using a machine, some blood is taken through your/your child's central line. The machine separates it into red cells and white cells. The machine treats the white cells with UV light and then all of the blood, including the treated white cells, are given back through the central line.

GvHD symptoms and treatment

Part of body	Treatment
Skin and hair	
• Red/flushed (erythema) • Dry/flaky, especially on knees, elbows and in skin creases • Patchy in colour • Patchy hair growth • Hair and eyebrows may have streaks of white in them • Skin or joint tightening - restricted movement, may be painful	• Daily skin care with soap-free cleansers and regular emollient cream use • Use of gentle shampoos • Pain killers and physiotherapy
Mouth	
• Dry mouth • Difficulty in tasting foods • Inside of the mouth looks white	• Regular mouth care as advised by the SCT team • A dentist will be involved in your care following SCT
Gut (upper/lower)	
• Poor appetite or unable to eat • Difficulty in swallowing • Diarrhoea • Tummy pain and cramping • Poor weight gain	• Support with nutrition (feeds via NG, PEG or PN) • Wash and use barrier creams after diarrhoea to prevent skin breakdown and infection • Pain killers for tummy pain
Lungs	
• Difficulty in breathing following exercise	• May be referred to a specialist lung/chest doctor
Eyes	
• Dryness • Sore eyes	• Eye drops and creams • Possible referral to a specialist eye doctor (ophthalmologist)
Vaginal	
• Symptoms may not become apparent until sexual activity commences • Dryness, itching and discomfort • Narrowing of the vaginal opening • Pain or discomfort during sexual intercourse	• Use of lubricants and possible referral to a gynaecologist
Penis	
• Phimosis – foreskin is tight and cannot be moved fully over the penis • May become swollen and infected	• This may require a circumcision

Graft versus leukaemia effect

Although GvHD is seen as a complication of SCT, if you have leukaemia or lymphoma, GvHD can be useful. As part of the process, donor T-cells may also recognise host blood cells, including leukaemia or lymphoma cells, and seek to destroy them. This is called a graft versus leukaemia or lymphoma effect (GvL).

You may feel worried, but please remember you can discuss your fears and concerns with your SCT team.

Scan to order or download this factsheet or any other CCLG publications FREE of charge.

USEFUL ORGANISATIONS

Children's Cancer and Leukaemia Group (CCLG) publishes a variety of free resources to order or download **www.cclg.org.uk**

Young Lives vs Cancer offers practical support to children and young people with cancer and to their families **www.younglivesvscancer.org.uk**

Macmillan Cancer Support offers support and advice to those affected by cancer. **www.macmillan.org.uk**

Notes

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Children's Cancer and Leukaemia Group (CCLG) is a leading national charity and expert voice for all childhood cancers.

Each week in the UK and Ireland, more than 30 children are diagnosed with cancer. Our network of dedicated professional members work together in treatment, care and research to help shape a future where all children with cancer survive and live happy, healthy and independent lives.

We fund and support innovative world-class research and collaborate, both nationally and internationally, to drive forward improvements in childhood cancer. Our award-winning information resources help lessen the anxiety, stress and loneliness commonly felt by families, giving support throughout the cancer journey.

Our work is funded by donations. If you would like to help, text 'CCLG' to 70085 to donate £3. You may be charged for one text message at your network's standard or charity rate. CCLG (registered charity numbers 1182637 and SC049948) will receive 100% of your donation.