Why do I need this treatment?

We usually recommend this treatment for patients with either Non-Hodgkin’s lymphoma or Hodgkin’s lymphoma who require additional therapy following standard chemotherapy. The aim is to either cure your disease, or lengthen the period before your disease returns.

What does the treatment entail?

You need to prepare yourself for an inpatient stay of 4-5 weeks. Most of this time will be spent in a special filtered air isolation room. You will be able to leave the room to use the ward facilities until your neutrophil count drops. Visitors can visit you during your treatment but we discourage people visiting who have symptoms of viral or bacterial illnesses. We would also limit visitors to relatives or close friends with no more than 2 people visiting at one time.

Your treatment requires the use of a Tunnel Line (Hickman Line). This has the benefit of you no longer requiring cannulas or blood tests. All the drugs and blood products can be given through the line. The Radiologists insert the lines under sedation (if required) which we will organise before your admission.

Before we start the treatment, we will organise a series of tests to assess your kidneys, liver, lungs and heart. All these tests will be carried out on an outpatient basis.

What chemotherapy will I receive?

A combination of 4 intravenous chemotherapy agents will be given to you for 6 days, followed by re-infusion of your stem cells, which have been harvested prior to your admission for the transplant. Traditionally the day we give you your stem cells back is called day 0. It will then take 2 to 3 weeks for your bone marrow to recover from the treatment and you will have to stay in hospital for that period of time. The total inpatient stay is usually 4 weeks, but some patients require a longer stay.

The 4 chemotherapy agents and the days they are given are as follows:
BCNU (carmustine): day-6
Etoposide: each day from day –5 to day –2
Ara-C (cytarabine): each day from day –5 to day –2
Melphalan: on day –1

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On day -1, you will be given a large amount of fluid intravenously to aid excretion of the melphalan by the kidneys. We will monitor the fluid you drink and the urine you pass accurately. It is important that you make a note of the drinks you have and do not flush any of the urine down the toilet before we measure the volume of it!

The stem cells will be given to you by a doctor or a nurse. It is exactly like a blood transfusion: the stem cells are thawed and re-infused through the Hickman line. The number of bags will vary from one patient to the other. The stem cells are suspended in a solution of DMSO. This smells and tastes like sweet corn and your breath may smell for 2 to 3 days after the re-infusion of the cells. The infusion can sometimes cause an allergic reaction and we will pre-medicate you prior to giving you the stem cells. It is not unusual to have pink urine after the stem cell infusion.

**What side-effects can I expect?**

**Nausea:**

All of these chemotherapy agents can cause nausea and vomiting. We will give you a combination of anti-sickness medications in the form of injections and tablets. Occasional patients are very sensitive and may require an anti-sickness pump.

**Flushing:**

BCNU, which is given on day -6 can cause flushing and headaches. This usually improves once the infusion has finished. The headaches can last for a few hours after the infusion.

**Blood pressure:**
Occasionally Etoposide can cause your blood pressure to fall. We will monitor this carefully, however it is important that you tell us if you feel dizzy or unwell.

**Rash:**

Many of the drugs we give can cause a rash, it is important that you let us know. Ara-C can particularly cause a rash and fever.

**Gastro-intestinal side-effects:**

The chemotherapy agents will affect the lining of your mouth, throat, stomach and bowel. This will tend to reduce your appetite and may give you diarrhoea. Virtually all patients will suffer with a severe sore throat (mucositis) and swallowing can be difficult. We suggest that you suck some ice/lolly pops during the melphalan infusion, which we have found to reduce the sore mouth. Both the mucositis and diarrhoea last about 7 to 10 days. We have many ways of helping your symptoms including pain killers.

**Infections:**

The chemotherapy causes neutropenia, which increases the risk of infection. We will try to prevent this by giving you a prophylactic combination of:
- **Antibiotic:** ciprofloxacin
- **Antiviral:** aciclovir
- **Antifungal:** itraconazole

Although this may help, many patients will still experience fever and rigors (shakes). We treat this promptly with injections of antibiotics rather than tablets. Occasionally patients can have severe infections, which are life-threatening. If this occurs, sometimes we have to monitor you on the intensive care unit until you are better.

It is very common to have a line infection during the time of neutropenia. The exit site may become red, or sometimes the skin over the line becomes inflamed. In this situation we may need to remove the line if it does not improve with antibiotics.

**Blood products:**

Due to bone marrow suppression, you will become anaemic and thrombocytopaenic (low platelet count which increases the risk of bleeding). We will give you blood transfusions and platelet transfusions as required until your bone marrow recovers. You will require irradiated blood products for life and we will give you an information card concerning this.
Hair loss:

The chemotherapy will make you lose your hair. This is temporary and we will discuss with you strategies to cope with this.

Mortality:

The transplant procedure carries a mortality risk, usually from infection or bleeding. In our unit this risk is less then 5%.

**Long term side effects:**

Immunosuppression:

Even after your bone marrow recovers and your neutrophils are back to a normal level, your immunity will be low for a few months. During that period you will be seen regularly as an outpatient and you will need to be treated promptly if you develop a temperature. We will continue the antibiotic prophylaxis and to prevent an infection called Pneumocystis Carnii Pneumonia (PCP), you will require either nebulisers monthly or additional antibiotics. This will usually be stopped after a period of 6 months once we are happy with your immunity status. **Do not stop them yourself.**

Fertility:

The chemotherapy drugs can cause infertility, although not always, so you must continue to take precautions against pregnancy. Often patients have received prior chemotherapy and will have discussed fertility with their doctor. However, you may want to discuss this further prior to the transplant. For men we can offer sperm storage. Options are more limited in women, so please ask if you would like to persue this further.

Secondary cancer and leukaemia:

You should be aware that there is a small risk that the chemotherapy agents can cause secondary leukaemia and cancer at a later date. We would be happy to discuss this with you further if you wish.

What happens when I go home?

We will let you go home when your blood counts are safe and all your side effects have gone. This varies between patients and it is difficult to give you an accurate time frame prior to the transplant. You will have medications to take home. Follow up will be on ward 10, you must have an appointment before leaving the ward. The frequency of follow up depends on your specific needs, but in the first few weeks will be once or twice a week.