High Dose Chemotherapy and Peripheral Blood Stem Cell Transplantation
A guide for patients and their families
Transplantation as a day patient

Modern advances in treatment now may enable a significant proportion of your care to be given as a day patient through our day hospitals. For you to be managed as a day patient you are required to reside no further than thirty minutes drive from the centre and have someone who can stay with you throughout the recovery phase. You would be required to attend the centres daily for assessments until your blood cell counts recover. Your blood cell counts can take approximately three weeks to recover after the stem cell transplant.

It is important to discuss with your doctor and nurse how you and your carer are managing at home. Often solutions can be discussed which will assist you and your carer. However, there may be times when you require admission to The Wesley or Mater Private Hospitals.

Transplantation as a day patient will be discussed in more detail later in the booklet.

Understanding the stem cell transplant process

The purpose of stem cell transplantation is to cure or to slow down the growth of many different types of cancer using high doses of chemotherapy. Because of the intensity of the chemotherapy, your body’s ability to make blood cells is destroyed. After you receive the high dose chemotherapy, your ability to make blood cells must be restored. Healthy stem cells are given to you as an infusion. The stem cells grow and restore your body’s ability to produce blood cells.
What is a stem cell?
Stem cells originate in the bone marrow and are referred to as ‘seed’ or precursor cells. Bone marrow is the spongy tissue found in the cavities of your bones where all of your blood cells are produced. Each type of blood cell in the marrow begins its life as a stem cell.

The stem cells then divide and form the different cells that make up your blood and immune system. These include white blood cells that fight infection (leucocytes, neutrophils), red blood cells that carry oxygen (erythrocytes), and platelets that enable blood to clot, thereby controlling excessive bleeding.

Conditioning
Chemotherapy and radiotherapy in normal doses are often highly effective in treating many cancers and leukaemia. However, in some cancers and leukaemia much higher doses of chemotherapy and radiotherapy are required to achieve the best response and to kill the maximum number of cancer cells. Higher doses of chemotherapy and radiotherapy have a very toxic effect on the bone marrow. Following high doses of anti-cancer therapy or ‘conditioning’, your previously stored stem cells are infused back into the body in a way similar to a blood transfusion. The stem cells migrate to the bone marrow to allow regeneration of the bone marrow and the production of blood cells.

PBSCT is a multi-step process. Each phase of the transplant is explained in detail later in this booklet. Remember this is a guide only, specific details vary for each individual:

• Stem cell mobilisation and collection;
• Work up and preparation for transplant;
• Admission for high dose anti-cancer treatment (conditioning);
• Reinfusion of stem cells;
• Discharge from hospital to day centre awaiting recovery of bone marrow;
• Daily visits to centre/hospital inpatient;
• Long-term recovery and follow-up.
Preparation for peripheral blood stem cell transplantation (PBSCT)

Careful planning and preparation for your PBSCT is necessary to enhance the smooth running of the procedure.

Your doctor will spend time discussing with you why PBSCT is an appropriate treatment option. Further explanation and discussion with the stem cell transplant program coordinator will follow.

Preparing for a PBSCT
There are a variety of ways in which you can help to prepare yourself for PBSCT. Here are some suggestions:

1. Establish one or two close support people/carers to assist you throughout your treatment and follow-up. They will be needed for both practical and emotional support.
2. Discuss health insurance issues, pharmacy and other costs with your doctor.
3. Ensure you maintain a nutritious, well balanced diet. A referral to a dietitian will be arranged prior to admission.
4. Stop smoking.
5. Establish an exercise program that can be maintained throughout your treatment period.
6. Discuss contraception with your doctor.
7. Start preparing for the financial and practical arrangements you will need to make prior to the transplant period. This may include arranging for time away from work or arrangements at home regarding children and pets.
8. Check if you or your support person are eligible for any financial support eg. Patient Transit Scheme, carer pension, sickness benefits, assistance from the Leukaemia Foundation of Queensland or the Queensland Cancer Fund.
9. Discuss any fears, worries or concerns that you may have with your family, doctor or nurse. It is a good idea to write down any questions that may arise so that you do not forget them at your next hospital visit.
10. You may wish to have your hair cut in preparation for hair loss due to the chemotherapy. Remember hair loss is not permanent.
11. Dental check-up.

Health insurance
It is important to have accurate information and a good understanding of your health insurance cover and reimbursement. Out-of-pocket expenses may apply depending on your level of cover and health insurance fund. Become familiar with your health insurance plan. Hospital and Icon staff can assist with information regarding out-of-pocket expenses.

Pre-transplant tests
A number of procedures and tests will be organised as pre-transplant investigations so that your treatment and care can be planned accordingly. During this time it may be necessary for you to see other doctors who will assist in your overall assessment.

1. Blood tests
   You may require a wide range of blood tests, including tests for hepatitis and HIV. These tests will be organised with your routine blood tests.
2. Echocardiogram
   This scan looks at the efficiency of your heart muscle by measuring the percentage of blood that is ejected from your heart over a series of beats. There is no special preparation required. The test will take approximately one hour.
3. **Lung function test**
   This test measures various aspects of your lung function. It will assist in the selection of appropriate transplant care. The test will take approximately one hour.

4. **Bone marrow biopsy**
   Not everyone will require a bone marrow biopsy prior to transplant. Your doctor will discuss this with you. If required, the bone marrow biopsy will be performed in our day hospital.

5. **Central venous catheter**
   Prior to commencing your treatment, a central venous catheter will be placed into a large vein in your chest. The catheter is used to facilitate the delivery of the high dose chemotherapy and reinfusion of your stem cells. The catheter will also be used for taking blood tests and the administration of other medication and blood products. The catheter is a plastic tube with two or three lumens or tubes and is usually inserted using sedation and local anaesthesia in the x-ray department.

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**Preparing for hospital**

You may like to bring the following to hospital:

- comfortable pyjamas (preferably open up the front) and day clothes (tracksuit, t-shirts)
- scarves and turbans
- moisturiser containing no perfume or alcohol (eg. Sorbolene)
- antibacterial soap for showering
- new soft toothbrush, low irritant toothpaste and lip balm
- alcohol free nappy wipes
- an electric razor
- new pillow and or sheep skin (optional)
- books, magazine or walkman – items such as magazines should be new and restricted to a few copies at any given time
- no fresh flowers are allowed in the ward, however balloons, cards or silk flowers are acceptable.

**Preparing your home**

You may like to prepare the following for home:

- vacuum and clean house
- keep tidy and as dust free as possible
- buy soap on tap (antibacterial) and paper towel for regular hand washing
- if possible, organise a quiet area where you can rest through the day – this area should be away from general noise and cooking smells
- ensure any pets can be kept away from sleeping areas
- clean fridge and keep shelf available for medication
- buy high protein foods such as sustagen (refer to dietitian section)
- organise magazines, books, videos etc
- ensure after hours telephone numbers are readily accessible
- ensure a working thermometer is available.

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*Establish one or two close support people/carers to assist you throughout your treatment and follow-up.*
The transplant procedure

In hospital
You will be admitted to Ward 4W (Leukaemia Foundation Bone Marrow Transplant Unit) of The Wesley Hospital, or Ward 8S at the Mater Private Hospital, usually the day before your chemotherapy is to commence. You will remain an inpatient until after your stem cells have been reinfused.

When you are admitted to the ward your weight and observations will be recorded, blood tests taken and fluids commenced via your central venous catheter. This is all part of the preparation for commencing your anti-cancer treatment. You will have access to the dietitian and counselling services offered by the hospital. The Leukaemia Foundation of Queensland and The Queensland Cancer Fund also offer support services and courses to assist you and your family in understanding and coping with cancer and treatment side effects.

Support services and courses assist you and your family in understanding and coping with cancer and treatment side effects.

Conditioning treatment
Conditioning treatment is high-dose anticancer therapy, which is designed to kill the maximum number of cancer cells.

The type and combination of chemotherapy and/or radiotherapy you receive specifically targets your disease and may be administered either intravenously and/or orally. Usually your treatment is given over a period of days. Treatment duration varies depending on the disease. Your doctor will discuss with you specific information regarding the duration and type of treatment you are to receive.

A ‘side effect’, but also the desired effect, of all conditioning treatments is it obliterates or ‘wipes out’ your bone marrow. The reinfusion of your previously harvested and stored stem cells allows the regrowth of these cells in your bone marrow.
Reinfusion of your stem cells

One or two days following completion of your conditioning therapy, you will receive your stem cell reinfusion. The reinfusion of your stem cells usually takes place in the morning and takes approximately 30 - 60 minutes. The day of your stem cell reinfusion is known as ‘Day 0’ as in a count down. Subsequent days are counted upwards. For example, the day following your stem cell reinfusion is referred to as ‘Day +1’.

Your frozen stem cells will be thawed in a warm water bath at your bedside and then reinfused via your central venous catheter, much like a blood transfusion, but at a quicker rate. You will be closely monitored throughout the procedure.

As part of the storage process, stem cells are placed in a preservative called Dimethyl Sulfoxide (DMSO). During reinfusion DMSO may cause slight flushing or nausea, abdominal cramps or an unusual taste in your mouth. Medication to minimise these effects are administered prior to the infusion.

These drugs may cause you to feel drowsy. DMSO is expelled from your body through your breath. If you do experience any side effects you may find deep breathing and relaxation exercises helpful. It is important to remember that any side effect you experience will only be present for a short time.

For 24 - 48 hours following stem cell reinfusion, red discolouration of the urine may occur. This is normal, however, you may be given extra fluids via your catheter. DMSO has a distinct odour that you may not smell but your friends and relatives may. This odour may be present for a few days following your transfusion.
Post transplant care

Day +1
The day following the reinfusion of stem cells, that is Day +1, growth factor injections (Neupogen) will commence. Neupogen is now given to stimulate the reproduction of your neutrophils (a type of white cell). This ensures that the period where your white cell count is below normal is shortened, reducing the length of time you are susceptible to infection.

At this stage there is the potential for patients to feel well enough to be discharged from hospital. However, you must be reviewed each day by your doctor as a day patient at an Icon day hospital.

Be sure to discuss any issues including medications and daily centre appointments with your doctor and nurse prior to going home.

Engraftment
Following PBSCT, there is a period of about 9-14 days before the stem cells ‘engraft’ or start to produce mature bone marrow cells (that is red cells, platelets and white cells). Measuring the number of white cells and platelets is the best indicator of bone marrow function.

Following the reinfusion of your stem cells your blood count will slowly drop for about 7-8 days. By about Day +11 (that is 11 days following the reinfusion of your stem cells) your blood counts will begin to recover. Usually the white cells recover before your platelets and this is when you will start to feel better.

As stated previously, until your bone marrow fully recovers, that is blood counts are within normal or acceptable range, you will be closely monitored. This is usually for a period of 3-4 weeks.

Potential side effects of conditioning treatment
Side effects often depend on your blood counts. Most side effects will start to occur as your blood counts decline, approximately Day +5, and will increase in severity to approximately Day +10. As your blood counts recover, normal cells will also recover and the side effects associated with transplantation will become less. Ways to minimise side effects of conditioning therapy will be discussed in the next section.

The following are some potential side effects that may occur. You may experience some or all of these in the post transplant period. The above time frames given for the occurrence of potential side effects are a rough guide only. The timing, duration and severity of side effects will vary from person to person.
Neutropaenia/infection

As your white cell count drops following high dose chemotherapy, your body will not have the defences to fight infection. This will cause you to be more susceptible to infections. Infections that occur when your counts are low are generally caused by organisms that naturally occur within your own body. As will be discussed in more detail in the next section, particular attention to personal hygiene and frequent thorough hand washing is very important. The risk of infection is greatest from Day +5 to Day +10.

Thrombocytopenia/Bleeding

As your platelet count drops you are at an increased risk of bleeding and bruising. It is important that you avoid any activity that may promote bruising or bleeding. If you experience any excessive bruising, bleeding from any part of the body, headaches or visual disturbances please contact your doctor. Your platelet count will be checked each day and if necessary your doctor may request platelet transfusions.

Anaemia

Following your transplant your bone marrow may not produce adequate numbers of red blood cells, so anaemia may occur. This may be one reason why you feel tired. Your doctor will monitor your red blood cell count regularly and will order blood transfusions when necessary.

Mucositis and oral hygiene

Mouth ulcers and inflammation of the lining of your mouth may occur. This is called mucositis and is most likely from Day +5. This could lead to infection or problems with eating and drinking. The doctors and nurses will assess your mouth for signs of mucositis and infection each day. You will be provided with a mouth care regime. It is important during the transplant period that you strictly adhere to the mouth care regimen as discussed to help reduce discomfort and infection. If you are having difficulties performing your mouth care you must inform your doctor and nurse. Pain from mucositis can become severe and may require the administration of strong pain relief and in some cases may require admission to hospital.

Here are some potential side effects that may occur.

You may experience some or all of these in the post transplant period.
Nausea and vomiting

Nausea and vomiting is one of the most common side effects experienced with high dose chemotherapy. Regular medication (antiemetics) will be given to prevent or reduce the severity of nausea and vomiting. Other strategies that you can do to reduce much of the nausea and vomiting include eating small frequent meals or foods with minimal smells. The dietitian and nurse will discuss other strategies with you.

Diarrhoea

Diarrhoea is a common side effect experienced with high dose chemotherapy and can usually be relieved by medication. You must inform your doctor and nurses of loose bowel motions so appropriate medication and supportive care can be given. It is also important to clean the anal area with warm soapy water following each bowel motion. Some people find toilet paper rough and may prefer to use a softer material like baby wipes (containing no alcohol) following bowel motions.

Fatigue

Fatigue – the feeling of being exhausted all or most of the time – is common and can be frustrating and overwhelming following high dose chemotherapy and transplantation. Fatigue may continue for several months following transplant. It is important that you schedule frequent rest periods throughout your day and do not over exert yourself. Maintain a nutritious diet and gentle exercise. Monitor the number of visitors you receive and allocate one carer that friends and relatives can ring to check on your progress.

Hair loss (alopecia)

Unfortunately hair loss is inevitable. Usually scalp hair begins to fall out about 1-2 weeks after the start of chemotherapy. You may prefer to have your hair on your head cut short or shaved prior to commencing high dose chemotherapy transplant. Loss of other body hair may also occur. Hair will start to grow back within 2-3 months.

Skin changes

You may notice changes to your skin, in particular discolouration or pigmentation. These changes are dependent on which drugs you have received. Unless otherwise indicated, you may wish to use a body moisturiser. It is recommended you use a moisturiser free of perfume or alcohol, for example Sorbolene. Use sunscreen, a hat and long sleeves when outdoors as your skin will be very sensitive during this process.
**Food may taste different from usual. Trying different foods or adding more flavour to your current meals may help.**

**Taste bud changes**
Food may taste different from usual. Trying different foods or adding more flavour to your current meals may help. Changes in taste may last up to a few months following transplant.

**Emotions**
Depression may occur in varying degrees. You may find that you cry a lot or get angry or uptight more frequently than normal. You may lose interest in doing things. You, your partner or your children may find the change in your daily routine throughout this period very stressful. Your doctor or nurse can assist if you experience any of these feelings, or at any time you are finding the treatment difficult.

**Infertility and sexuality**
Concerns regarding your ability to have children following PBSCT needs to be discussed with your doctor. There are some reports of fertility recovering following certain chemotherapy regimes but this seems to be dependent on your gender, age at transplant and previous therapy. For men, there may be the option of sperm banking. For women the option for storing eggs may prove difficult to achieve. Any questions should be discussed with your doctor. You may lose interest in sexual activities. Your partner may also experience similar changes in their libido. This may be related to the treatment and the stress associated with your current situation.

Physical changes may also occur, such as vaginal dryness. Such concerns can be overcome with measures such as lubricants. Ensure you raise any concerns with your doctor. Contraception should also be discussed with them.
Your role in the recovery process

By adhering to instructions and recieving the supportive therapies on offer at our day centre and the hospital, you will likely be able to prevent or minimise potential side effects of your treatment.

Daily visits
During your visits to our centre, blood tests will be performed to check your cell count. This will be done via your central venous catheter. You will also be given fluids via this catheter. Your doctor and nurse will carry out a comprehensive health assessment. This will help identify problems or potential problems such as signs of infection, mouth ulcers or bleeding. You will be asked questions as to how you are feeling and coping at home. It is important that any problems or issues are discussed no matter how irrelevant you think they might be. You may also require additional treatment such as blood products or other medication and antibiotics.

Temperature
Until your white cell count is within normal range you are required to take and record your temperature every four hours during waking hours or when you feel unwell. It is very important that you take precautions to minimise your risk of exposure to infection. Organisms that normally occur within your body may cause infections while your blood counts are low. Avoiding people with infections such as chicken pox and influenza is important. Strict isolation either at home or in hospital does not prevent most infections.

It is common to have a temperature during the time your white cell count is low. Your white cell count is at its lowest from approximately day +5 to day +10. **It is vital that you report any rise in your temperature above 38°C or any episodes of shivering or signs of infection immediately.** Your doctor and nurse will discuss this further with you. A doctor is available 24 hours a day, 7 days a week to take your call.

Nutrition
It is recommended that you try to drink about 2-3 litres of fluid each day. Maintaining nutritional status is important to help prevent weight loss and to maintain quality of life. Eating regular meals and including nourishing snacks between meals is necessary to meet energy and protein requirements.

A doctor is available **24 hours a day, 7 days a week to take your call.**
If your oral intake deteriorates or you have any questions regarding your diet, ask to see the dietitian who is able to advise you on appropriate food choices and use of nutrition supplements. An appointment will be made for you to see the dietitian prior to transplant.

During your hospital admission, it is expected that you will experience one or more of the following symptoms – poor appetite, nausea, sore mouth and throat, taste changes or diarrhoea. During this time it may be necessary to modify the texture or fibre content of your diet or to use nutritional supplements. The dietitian is available to assess your nutrition requirements and to advise on appropriate menu selection and dietary restrictions when following a low pathogen diet.

Activity
Studies performed have documented the benefit of exercise in promoting overall recovery and quality of life. It is recommended that you perform gentle exercises and stretching to keep muscles functioning. Do as much of your care as possible yourself. However, it is important not to over do it. Discuss types of exercise or activities you would like to do with your doctor and nurse.

Hygiene

Body
It is essential to maintain good personal hygiene during your transplant. Frequent hand washing by you and your carer is essential to prevent transmission of infections. Liquid soap and paper towels should be used for hand washing and drying.

You must also shower every day and wear clean clothes. Use only an electric shaver if you need to shave. During your shower inspect your skin for any changes, rashes or redness. Inform your doctor of any concerns at your next visit. Following each bowel motion you will need to clean your anal area with soap and water, rinse and pat dry.

While in hospital and at the Icon day hospital, you will be instructed on how to care for your central venous catheter.

Mouth
You will be provided with a mouth care regime to minimise the effects of high dose chemotherapy. Lip balm should be applied to prevent your lips cracking. Use a soft toothbrush to clean your teeth. When cleaning your teeth avoid your gums and do not use dental floss or mouthwash containing alcohol.
Clinical trials
Clinical trials are designed to develop drugs, techniques and equipment to improve the efficiency and effectiveness of cancer care while maintaining safety. Many of the finer points of stem cell transplantation are still being developed. The technology and techniques we can offer you today are a result of past clinical trials. Through Icon Cancer Foundation, Icon Cancer Care aims to give patients and clinicians access to national and international trials. These clinical trials improve the quality of care for you and future patients. You may be asked to participate in a clinical trial.

What are the limitations of peripheral blood stem cell transplant (PBSCT)?
Although PBSCT has been selected as the best treatment option for you, there are complications that will be discussed with you by your doctor prior to you making the decision to undergo the transplant.

1. Despite its powerful anti-disease effect the treatment may not prevent the cancer/leukaemia from returning.
2. As explained previously, you will probably experience some unpleasant side effects from the treatment.
3. There are serious potential complications of PBSCT, some of which could prove fatal. The mortality rate from a PBSCT has reduced in the last 5 years to approximately 1%. This is dependent on your disease and general state of health. Your doctor will discuss these risks with you.
Conclusion

This booklet has been written to assist you throughout your PBSCT experience. It is in no way conclusive. Many of the experiences you may have will be individual to your diagnosis, treatment and physical condition. You are encouraged to ask questions of your doctor and nurse. Written literature on the specific drugs and management will be given to you at the appropriate time.

It is important that you ask questions, even if the questions have been asked before. Write down any questions you may have for discussion with your doctor. Remember it is ultimately your decision as to whether you go through with the transplant procedure or not.

We are here to assist you in making the decision and to support you throughout the treatment process and afterwards.

We value your views and encourage you to assist us in improving this booklet. Any suggestions as to how this booklet could be improved would be greatly appreciated.

Carer responsibilities

During your transplant period we request that you have a family member and/or friend designated as your carer. Each patient, family member and carer will find different ways of organising and coping with their day. The following is a list of responsibilities that gives the carer some idea of what is expected.

Making arrangements
You will need to be aware of appointment times and travelling arrangements. Often you will need to escort your loved one to and from appointments. You must know how to contact the doctor and the Icon day hospital after hours.

Emotional support
Simply being nearby will give a great amount of emotional support. You will also need to give encouragement and reassurance.

Physical support
You may need to assist and/or encourage performance of daily hygiene needs and light activities. You may also need to encourage diet and fluids.

Other areas you can assist in are monitoring temperature, medication taking and identifying any changes or concerns in condition.

Keeping a logbook of activities, diet, blood counts and temperatures helps to remember events. You may like to record this information in a diary along with appointment times. Alternatively there is space provided at the back of the booklet to record such information.

Maintaining the home environment
It is important that you keep the living areas clean and tidy. Refer to the diet section for instructions regarding food handling and general hygiene.

Patient advocacy
Generally speaking, two sets of ears are better than one. You can help in making decisions by listening to the doctor and nurses and asking questions.

Yourself
It is important you look after yourself. This includes paying attention to your diet, exercise and having adequate rest. You may find it beneficial to have a network of people who you can talk to and express your feelings. These people can also relieve you when you need to have a break. If at anytime you feel as though you are not coping or do not understand something, please do not hesitate to ask the doctor or nurse.
Questions you want to ask
Glossary of terms

A

**Allogeneic transplant:** a transplant using stem cells from peripheral blood or bone marrow from a related or unrelated donor

**Alopecia:** hair loss

**Anaemia:** when your haemoglobin count is below the recommended normal range

**Analgesia:** pain-relieving medication

**Anticoagulant:** medication used to stop your blood from clotting

**Antiemetic:** medication to prevent you feeling sick/nauseated

**Antifungal:** medications given to fight or prevent fungal infections, e.g. Amphotericin, Diflucan, Nilstat

**Apheresis:** (also known as cell separation) the procedure used to separate certain blood cells from the blood for collection and later use

**Autologous transplant:** transplant using one’s own marrow or stem cells

**C**

**Blood counts:** a measure of the number of red cells, white cells and platelets in the blood stream (see FBC)

**Blood cultures:** blood test taken to assess for infection in the blood

**Bone marrow:** soft spongy material in bones that produces blood cells

**Central venous catheter:** line put into one of the large veins of the chest in order to give chemotherapy and other drugs eg. Hickman Catheter

**Catheter chemotherapy:** treatment with drugs to destroy cancer cells or to prevent or slow down further growth. There are many different forms of chemotherapy which act on cells in different ways

**Cytomeglovirus:** (CMV) virus present in the majority of the population, normally harmless but can cause a life threatening infection in some transplant patients

**CD 34 blood test:** a blood test used to measure the number of stem cells in your peripheral blood

**D**

**Diuretic:** medication which helps rid the body of excess fluids

**E**

**Engraftment:** process whereby new marrow begins to grow and produce new blood cells. Is when blood counts begin to rise

**Electrolytes:** certain elements in the blood such as potassium, sodium and magnesium

**F**

**FBC:** (Full Blood Count) a laboratory examination to count the number of white and red blood cells and platelets in a measured volume of blood

**G**

**GCSF:** (Granulocyte Colony Stimulating Factor) a hormone which stimulates the stem cells to produce more neutrophils (a type of white cell)

**Growth factors:** hormones which stimulate the production of certain blood cells
**Glossary of terms continued**

**H**

*Harvesting:* the collection of stem cells  
*Haemoglobin:* component of your red blood cells which carries oxygen to the cells in your body  
*Haematologist:* a Doctor who specialises in the management of diseases of the blood  
*Hickman’s Catheter:* the trade name of a type of central venous catheter (a silicone tube inserted into a large vein in the chest)  
*HLA:* (Human Leukocyte Antigens) are proteins that appear on all blood cells and most tissues. The test is used as part of tissue typing to compare compatibility of donor and recipient

**I**

*Immunosuppression:* suppression of immune system making the person more susceptible to infection and/or bleeding  
*Infusion:* introduction of a solution into the body through a vein for therapeutic purposes

**L**

*Leucocytes:* the term used collectively for all white blood cells  
*Leucopaenia:* a decrease in the total number of white blood cells resulting in a decreased ability for the body to fight infection  
*Lymphocytes:* a type of white blood cell

**M**

*Medical oncologist:* a physician who specialises in the management of cancer  
*Mobilisation:* the process of stimulating stem cells from the bone marrow into the peripheral blood stream  
*Mucositis:* inflammation of the tissues which produce mucous throughout the body (for example the tissue which lines your mouth)

**N**

*Nadir:* point when blood count is at its lowest level (usually 7-10 days following chemotherapy)  
*Neutrophil:* one type of white blood cell which fights infection  
*Neutropenia:* a decrease in the number of neutrophils resulting in a decreased ability for the body to fight infection

**O**

*Oedema:* the retention of fluid in legs or abdomen  
*Oncologist:* a Doctor who specialises in the management of cancer

**P**

*Petechiae:* small dark purple spots or rash under the skin, caused by blood leaking from small blood vessels  
*Platelet:* a component of blood involved in the body’s ability to clot

**R**

*Remission:* the absence of detectable disease following bone marrow biopsy, CT scans and/or specific blood tests

**S**

*Septicaemia:* infection in the blood stream  
*Stem cells:* the bone marrow stem cells are responsible for the manufacture of all the blood cells

**T**

*Thrombocytopenia:* a decrease in the number of blood platelets resulting in the blood taking longer than usual to clot
Appendix 1:  
Understanding your blood tests

Here is a guide to help you make sense of your blood counts. A calendar is provided to document these, so you can chart your progress. During your treatment your blood counts will fall to very low levels. Following the progress of your counts determines the function of your bone marrow.

Full blood count (FBC)
A full blood count tells you the number and type of each blood cell. The following table displays the normal values:

- Haemoglobin (Hb) 115-175g/L
- White Cells (WCC) 3.5-11.0 x 10/L
- Neutrophils (Nts) 1.5-6.5 x 10/L
- Platelets (Plts) 150 - 400 x 10/L

Red blood cells
The main role of red blood cells is to absorb and hold oxygen molecules that are transported by the circulatory system to the cells of the body. Red blood cells are able to do this because they contain a substance called haemoglobin.

If there are not enough red blood cells you may feel weak and run down. You may be pale and tire easily because your body is not getting all the oxygen that it needs. A shortage of red blood cells is called anaemia.

White blood cells
White blood cells are part of the body’s defense system. When they detect a foreign substance, such as bacteria or a virus, white blood cells can be produced rapidly and in very large numbers in order to destroy the substance. Insufficient white cells increases the frequency and severity of infections which can be life-threatening.

Platelets
Platelets congeal or clot blood to prevent bleeding. If a blood vessel is damaged (eg. by a cut or bruise) the platelets rush to the site and clump together to ‘plug the leak’, which will help prevent blood loss.
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Appendix 2:
Diet guidelines for immunosuppressed patients

The Wesley Hospital, Department of Nutrition Services Acknowledge:
Fred Hutchinson Cancer Research Centre Seattle Washington USA

Persons with depressed immune function due to chemotherapy are at increased risk of developing a food-related infection. The purpose of this diet is to help you avoid specific foods that are more likely to contain infection-causing organisms while allowing maximum healthy food choices. Choose food from the ‘approved’ column. Do not eat foods in the ‘not allowed’ column. You may want to discuss the safety of these or other foods with your dietitian.

This diet should be followed after all conditioning (high dose) chemotherapy. Your doctor and dietitian will provide guidelines as to when the diet is no longer required. In general, we are recommending that peripheral blood stem cell transplant patient follow the diet for the first three months after transplant. Prior to the end of these time periods, patients and their caregivers should discuss with their doctor whether or not the diet or parts of the diet should be continued.
<table>
<thead>
<tr>
<th>Food Group</th>
<th>Approved</th>
<th>Not Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dairy</strong></td>
<td>• All pasteurised, grade ‘A’ milk and milk products</td>
<td>• Unpasteurised or raw milk, cheese, yoghurt, and other milk products</td>
</tr>
<tr>
<td></td>
<td>• Commercially-packaged cheese and cheese products made with pasteurised milk (eg. mild and medium cheddar, mozzarella, parmesan, Swiss etc.)</td>
<td>• Cheeses from delicatessens</td>
</tr>
<tr>
<td></td>
<td>• Pasteurised yoghurt (most Australian varieties)</td>
<td>• Cheeses containing chilli peppers or other uncooked vegetables</td>
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<td></td>
<td>• Dry, refrigerated, frozen and pasteurised whipped topping</td>
<td>• Cheeses with moulds (eg. blue, stilton)</td>
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<tr>
<td></td>
<td>• Ice cream, frozen yoghurt, sherbet, ice cream bars, homemade milkshakes</td>
<td>• Sharp cheddar, brie, camembert, feta, farmer’ cheese</td>
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<td></td>
<td>• Commercial nutritional supplements and baby formulas, liquid and powdered</td>
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<tr>
<td><strong>Meat and Meat Substitutes</strong></td>
<td>• All well cooked or canned meats (beef, pork, lamb, poultry, fish, shellfish, game, ham, bacon, sausage, hot dogs)</td>
<td>• Raw or undercooked meat, poultry, fish, game, tofu</td>
</tr>
<tr>
<td></td>
<td>• Well cooked eggs (white cooked firm with thickened yolk is acceptable)</td>
<td>• Meats and cold cuts from delicatessens</td>
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<tr>
<td></td>
<td>• Pasteurised eggs substitutes (eg. egg beaters)</td>
<td>• Hard cured salami in natural wrap</td>
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<td></td>
<td>• Commercially-packaged salami and other luncheon meats</td>
<td>• Cold smoked salmon (fish)</td>
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<td>• Canned and commercially-packaged hard smoked fish: refrigerate after opening</td>
<td>• Pickled fish</td>
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<td>• Cooked tofu (cut into small sizes and boiled for a minimum of five minutes)</td>
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<tr>
<td><strong>Entrees/ Soups</strong></td>
<td>• All cooked entrees and soups</td>
<td>• All miso products (eg. miso soups)</td>
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<tr>
<td><strong>Fruit and Nuts</strong></td>
<td>• Canned and frozen fruit and fruit juices</td>
<td>• Unwashed raw fruits</td>
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<td>• Well washed raw fruit; foods containing well washed raw fruits</td>
<td>• Unroasted raw nuts</td>
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<td>• Dried fruits</td>
<td>• Roasted nuts in the shell</td>
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<td></td>
<td>• Canned or bottled roasted nuts</td>
<td>• Unpasteurised fruit and vegetable juices</td>
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<tr>
<td></td>
<td>• Commercially-packaged peanut butter</td>
<td></td>
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<tr>
<td><strong>Vegetables</strong></td>
<td>• All cooked frozen, canned or fresh vegetables and potatoes</td>
<td>• Unwashed raw vegetables or herbs</td>
</tr>
<tr>
<td></td>
<td>• Well washed raw vegetables</td>
<td>• Salads from delicatessens</td>
</tr>
<tr>
<td></td>
<td>• Fresh, well washed herbs and dried herbs and spices (added to raw or cooked foods)</td>
<td>• Commercial salsa stored in refrigerated case</td>
</tr>
<tr>
<td>Food Group</td>
<td>Approved</td>
<td>Not Allowed</td>
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</table>
| **Bread, Grains & Cereal Products** | • All breads, bagels, rolls, muffins, pancakes, sweet rolls, waffles, french toast  
• Potato chips, corn chips, tortilla chips, pretzels, popcorn  
• Cooked pasta, rice and other grains  
• All cereals, cooked and ready-to-eat | • Raw grain products |
| **Beverages**          | • Tap water and ice made from tap water (if using a water service other than city water service recommend using distilled or bottled water)  
• Commercial bottled distilled, spring and natural waters  
• All canned, bottled, powdered beverages  
• Instant and brewed coffee, tea; cold brewed tea made with boiled water  
• Brewed herbal teas using commercially-packaged tea bags  
• Commercial nutritional supplements, liquid and powdered | • Bore or well water  
• Cold-brewed tea made with warm or cold water  
• Unpasteurised fruit and vegetable juices |
| **Desserts**           | • Refrigerated commercial and homemade cakes, pies, pastries and pudding  
• Refrigerated, cream-filled pastries  
• Homemade and commercial cookies  
• Shelf-stable cream-filled cupcake, fruit pies, and canned puddings  
• Popsicle-like products | • Unrefrigerated, cream-filled pastry products (not shelf stable) |
| **Fats**               | • Oil, shortening  
• Refrigerated lard, margarine, butter  
• Commercial, shelf-stable mayonnaise and salad dressings (including cheese-based salad dressings; refrigerated after opening)  
• Cooked gravy and saucesr | • Fresh salad dressing containing aged cheese (eg. blue) or raw eggs, stored in refrigerator case |
| **Other**              | • Salt, granulated sugar, brown sugar  
• Jam, jelly, syrups: refrigerated after opening  
• Commercially-packaged (pasteurised) honey (may not say ‘pasteurised’ on the label)  
• Tomato sauce, mustard, BBQ sauce, soy sauce, other condiments (refrigerated after opening)  
• Pickles, pickle relish, olives (refrigerate after opening)  
• Candy, gum | • Unwashed raw vegetables or herbs  
• Salads from delicatessens  
• Commercial salsa stored in refrigerated case |

*NB: ‘Shelf-stable’ refers to unopened canned, bottled, or packaged food products that can be stored before opening at room temperature; container may require refrigeration after opening.*
# Contacts

## Your Doctor

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<th>Name</th>
<th>Telephone</th>
<th>After Hours</th>
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<td>07 3737 4500</td>
<td>07 3834 6922</td>
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## Your General Practitioner

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## Clinic Nurse

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## Hospital

- **Ward 4W (The Wesley Hospital)**: 07 3737 4500
- **Ward 8S (Mater Private Hospital)**: 07 3840 1566

## Other contacts

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Icon Cancer Care locations

Adelaide
First Floor, Tennyson Centre
520 South Road
Kurralta Park SA 5037
P 08 8292 2333 | F 08 8292 2287

South Brisbane
Level 5, Mater Medical Centre
293 Vulture Street
South Brisbane QLD 4101
P 07 3737 4500 | F 07 3737 4701

Townsville
9–13 Bayswater Road
Hyde Park QLD 4812
P 07 4795 7100 | F 07 4795 7101

Chermside
Level 1, Chermside Medical Complex
956 Gympie Road, Chermside QLD 4032
P 07 3737 4500 | F 07 3737 4801

Southport
Level 9, Premion Place, 39 White Street (Corner Queen and High Streets)
Southport QLD 4215
P 07 5657 6400 | F 07 5657 6401

Wesley
Level 1, Wesley Medical Centre
40 Chasely Street
Auchenflower QLD 4066
P 07 3737 4500 | F 07 3737 4601

This information was current at the time it was published and is intended as a guide only. It is not intended to replace information provided by your doctor or nurses. Each patient is an individual and responses may vary. If you have any questions, please talk to your doctor or clinic nurse.

For us, cancer is personal