

# Dietary advice for patients with neutropenia



**This publication has been produced and prepared by the London Haematology Dietitians Group for patients who may be at risk of food borne infection due to high dose chemotherapy and/or bone marrow or stem cell transplants.**

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**At all times patients should rely on the advice of their specialist who is the only person with full information about their diagnosis and medical history.**

**For further advice contact the clinical information team on 020 7269 9060.**

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# INTRODUCTION

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**Following chemotherapy there is a risk of infection from bacteria or fungus in foods. This is for two reasons: 1) The white blood cells (neutrophils) that would usually fight food poisoning bacteria are at a low level. This is referred to as neutropenia. 2) The gut lining acts as a barrier between bacteria and the bloodstream. Chemotherapy and radiotherapy damage the gut lining making it easier for any bacteria to cross this barrier.**

During neutropenia, the following guidelines will help to reduce the risk of food poisoning whilst still allowing as varied a diet as possible. There is no single agreed definition of neutropenia or severe neutropenia; the levels quoted below are very widely used but if a doctor uses different levels patients should be guided by those. The type of advice to be followed is dependent on the number of white blood cells in the bloodstream: this is known as the neutrophil count.

This booklet provides general advice on safe food handling and storage for all patients at risk of neutropenia. This advice should be followed at all times by patients, their families and carers. It also lists some foods that patients with neutropenia should avoid – for those with a neutrophil count of  $0.5\text{--}2.0 \times 10^9/\text{litre}$  and those with a neutrophil count below  $0.5 \times 10^9/\text{litre}$ . The booklet also offers suggestions for suitable snacks for patients with neutropenia.

Patients should check their neutrophil count with the doctor or nursing staff and follow the advice as appropriate both in hospital and at home. Please note that the level of restriction required may vary dependent upon clinical condition and appropriate advice will be given. After a bone marrow or stem cell transplant, or when on immunosuppressive medication, it may be necessary to continue following these guidelines after the neutrophil count has recovered. This is because the immune system is weaker, increasing risk of infections. If any questions arise regarding this diet or eating in general the doctor or nurse specialist can refer patients to a dietitian for specialist assessment and advice.

# FOOD SAFETY

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## General advice

### Shopping

- Avoid buying food
  - ▶ with damaged or broken packaging
  - ▶ from fridges or freezers that are overloaded as the food may not be cold enough
- Buy chilled and frozen foods last and get them home as quickly as possible. If it is not possible to get food home immediately an insulated container or cool bag can help to keep food at the correct temperature
- Always check use by or best before dates on packaging
- Avoid shops where raw and cooked meats are stored in the same fridge or in a deli counter without a separating wall. Where possible buy pre-packed deli items

### Storage

- The fridge should be kept between 0°C and 5°C
- The freezer should be kept below -18°C. Always ensure that food is still frozen solid when it is removed from the freezer
- Store cooked food at the top of the fridge
- Raw or defrosting meat or fish should be stored at the bottom of the fridge in a covered container to prevent dripping or leaking into the fridge
- Do not overload the fridge or freezer as this will increase the temperature
- Eggs should be stored in the fridge
- Use and store food as per manufacturer's instructions and within best before or use by dates
- Never refreeze thawed food

## Food preparation

- Hands should always be washed with with warm water and soap before preparing food
- Hands must be washed after going to the toilet, sneezing and after touching pets, hair, dirty washing, rubbish, ready-made or raw food
- Do not use a tea towel to dry hands, keep a separate towel or use kitchen paper
- Cover any cuts and grazes with a waterproof plaster
- Keep pets away from work surfaces, food and your dishes
- Ensure any cloths or sponges are regularly bleached, disinfected or changed
- Avoid cross-contamination of food by changing or washing chopping boards and utensils between raw and cooked food
- Disinfect work surfaces regularly
- Wash can tops before opening them
- Wash fruit and vegetables before eating
- Ensure any cloths or sponges are regularly bleached, disinfected or changed

## Cooking

- Thaw meat and poultry in a fridge and not at room temperature as bacteria grow quickly at room temperature
- Cook all food thoroughly and ensure it is piping hot all the way through
- Meat should be cooked until the juices are clear
- Pre-heat the oven to ensure food is cooked at the recommended temperature
- Always follow manufacturer's guidelines and do not shorten cooking times
- Do not reheat cooked food

- Microwave cookers
  - ▶ can be used for defrosting
  - ▶ can be used for heating prepared foods according to manufacturer's instructions
- Do not put hot food in the fridge, as this will increase the temperature of all food in the fridge making it unsafe to eat
- Cool food at room temperature within an hour after cooking and then chill or freeze

## Eating out

- Ensure food is piping hot when served and cooked all the way through
- Choose freshly prepared foods from reputable outlets. Avoid salad bars, street vendors, market stalls and ice cream vans

# FOOD SAFETY ADVICE DURING NEUTROPENIA

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## Specific food safety advice for a neutrophil count of $0.5-2.0 \times 10^9/\text{litre}$

This list provides all the relevant examples of high risk foods that should be avoided and suitable alternatives.

Avoid	Alternatives
Soft ripened cheese e.g. Brie, Camembert, goat's cheese, paneer and labnah	Processed cheese e.g. Dairylea, Kraft, Philadelphia, mesh and halloumi
Blue veined cheese e.g. Danish blue and Stilton	Vacuum-packed pasteurised and hard cheese e.g. cheddar and Edam
Raw or lightly cooked shellfish	Well cooked shellfish as per page three e.g. prawn curry
Raw/undercooked meat, poultry or fish e.g. meat which is still pink and sushi; smoked items e.g. salmon or Parma ham, salami, caviar and oysters	Well cooked meat, poultry and fish; Vacuum-packed cold meats such as turkey and ham; tinned meat and fish
Raw eggs or undercooked eggs e.g. homemade mayonnaise, homemade ice cream, mousse, egg-nog, meringue and hollandaise sauce	Hard boiled eggs; shop bought mayonnaise, ice cream and other products made with pasteurised egg
Probiotics, live or bio products e.g. live yoghurts, probiotic containing supplements and drinks	Pasteurised plain, fruit yoghurts e.g. thick and creamy or Greek yoghurts or yoghurt products e.g. lassi
Paté	Pasteurised paté and paste in tins or jars that do not need to be refrigerated
All unpasteurised dairy products e.g. unpasteurised cheese such as parmesan or milk sold on local farms	Any pasteurised milk, soya milk, Jersey milk, UHT milk and cheese products

## Specific food safety advice for a neutrophil count below $0.5 \times 10^9$ /litre

In addition to the advice on page five for food safety, it is recommended that you also follow the diet for severe neutropenia when your neutrophil count falls below  $0.5 \times 10^9$ /litre.

This means that you will have a few further restrictions to consider. Foods to avoid as well as the recommended alternatives are listed below.

Avoid	Alternatives
Raw unpeeled fruit or vegetables including salad items, stuffed vine leaves, fatoosh and tabouleh; raw dried fruit, products containing these e.g. muesli, Bombay mix, confectionary; damaged or over-ripe fruit or vegetables; unpasteurised or freshly squeezed fruit or vegetable juice or smoothies	Good quality fruit and vegetables that are well cooked or peeled; UHT or long-life fruit juices – in cartons or jars; pasteurised smoothies; tinned fruit; cooked dried fruit e.g. in fruitcake, flapjacks or cereal bars
Uncooked herbs, spices and pepper	Cooked herbs, spices and pepper
Non-drinking water, bottled mineral or spring water, water from wells, water from coolers and water fountains	Freshly run tap/filtered/sterilised/ carbonated water Please check with your Hospital for guidance.
Unpasteurised or “farm fresh” honey and honeycomb	Pasteurised or heat-treated honey
Unnecessarily large packets of food items from pick and mix, universal jars; deli counter foods e.g. olives, houmus, shawirma and baklava	Ideally, packets should be for personal use only e.g. butter, sweets, pickles, small packets of food, houmus and baklava

*Please check with your Hospital Trust for the policy regarding foods brought in by visitors and supply of ice cream.*

# FOOD SUGGESTIONS

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**If you have a poor appetite and are finding it difficult to manage your meals whilst neutropenic, try some of these nourishing snacks:**

## Savoury

- Cheese and crackers
- Cheese spread or baked beans on toast
- Jacket potato
- Tinned spaghetti
- Fried rice with cooked meat added
- Rice porridge with cooked meat added
- Sandwiches – try adding salad cream or mayonnaise
- Breakfast cereals (at any time)
- Toasted muffins
- Meat dumplings/buns
- Processed cheese such as Dairy Lea triangles, Kraft cheese slices or halloumi cheese
- Roasted nuts, crisps and dips

## Sweet

- Chocolate or plain, sweet biscuits
- Sweets and chocolates – individual or bars
- Thick and creamy style yoghurts and fromage frais
- Individual cold desserts and tinned puddings.  
Try adding cream or custard
- Buttered hot cross buns or sweet waffles with syrup
- Individually packaged baklava

- Malt loaf or fruitcake
- Tinned fruit and cream/ice cream
- Kheer made with pasteurised milk
- Croissants
- Peanut brittle

## Liquids

- Soups – condensed and creamed varieties
- Milky drinks – Ovaltine, cocoa, Horlicks and hot chocolate
- Milkshakes
- Fizzy drinks, long-life fruit juice, squashes and cordials

## Nutritional supplements

- Build up, Complan or prescribed nutritional supplements such as Fortisip, Ensure Plus, Resource Shake, Clinutren 1.5 or Fresubin Energy drink

If you are advised by your dietitian or other healthcare professional to take nutritional supplements these can be stored unopened at room temperature. Once opened these drinks should be stored as follows:  
*unrefrigerated: 4 hours; refrigerated: 24 hours.*

# NOTES

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The following patient information booklets are available free of charge from Leukaemia Research. You can download them from our website or request copies by phone or post (see form inside):

## Leukaemia and Related Diseases

Acute Promyelocytic  
Leukaemia (APL)

Adult Acute  
Lymphoblastic Leukaemia (ALL)

Adult Acute  
Myeloid Leukaemia (AML)

Childhood Acute  
Lymphoblastic Leukaemia (ALL)

Childhood Acute  
Myeloid Leukaemia (AML)

Chronic Lymphocytic  
Leukaemia (CLL)

Chronic Myeloid Leukaemia (CML)

Aplastic Anaemia (AA)

The Myelodysplastic  
Syndromes (MDS)

The Myeloproliferative  
Disorders (MPD)

Multiple Myeloma (MM)

Hodgkin's Lymphoma (HL)

Non-Hodgkin's Lymphoma (NHL)

**Leaflets on a range of associated  
blood disorders are also available  
from Leukaemia Research**

Bone Marrow and Stem Cell  
Transplantation (BMT)  
– for children and adults

Donating stem cells  
– what's involved?

Donor Lymphocyte Infusion (DLI) –  
what's involved?

The Seven Steps – Blood & bone  
marrow transplantation

Undergoing high dose therapy and  
autologous stem cell transplant

Chemotherapy  
– what do I need to know?

Clinical Trials

Complementary and  
Alternative Medicine (CAM)

Dietary advice for patients  
with neutropenia

Supportive care

Treatment decisions

Watch and wait

Young adults with a blood cancer –  
what do I need to know?

Jack's Diary: an illustrated children's  
book to help young patients  
understand and deal with blood  
cancers, treatment and life changes

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