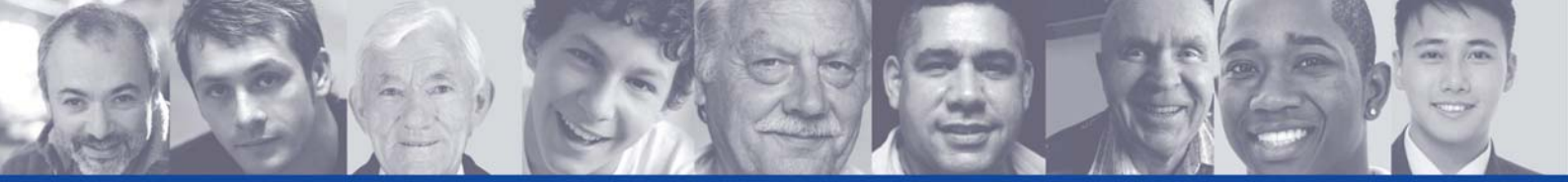

Factsheet No. 5

Male Cancer - Diet and Lifestyle

"Eating the right diet can cut your risk of cancer by up to 40%"[1]

This factsheet summarises some of the factors that are believed to have an effect on the development of the three male cancers: prostate, testicular and penile (cancer of the penis). We have brought together information from numerous research papers and nutritional textbooks. Where stated, some areas need further research to be conclusive. Following the recommendations and suggestions in this factsheet could help to reduce your risk of developing male cancer.

The development of cancer is a long and complicated process taking anything from 10 to 60 years, it is therefore necessary to sustain any preventative measures over a lifetime.

4 Steps to Help Yourself

1. ***Limit exposure to carcinogens (molecules that can initiate cancer development)***
2. ***Improve detoxification and excretion pathways to remove carcinogens from the body***
3. ***Reduce damage to cell DNA by increasing antioxidant intake***
4. ***Strengthen your immune system and reduce disruption to the cell DNA repair system to inhibit cancer development***

1. Limit exposure to carcinogens *(molecules that can initiate cancer development)*

Cancer is an uncontrolled growth of abnormal cells that invade and damage healthy tissue. Healthy cells turn cancerous when the DNA within them is disrupted or altered by mutation, disrupting control of cell division and possibly triggering cancer growth.

Cigarette smoking is a known dangerous carcinogen. Although it is the total number of cigarettes smoked and the duration of years of the habit that counts the most, the cigarettes smoked before the age of 18 are the most dangerous. This is due to the growing brains susceptibility to addiction, therefore making it more difficult to stop smoking. Lung cancer is the most frequent cigarette-related cancer. However, of the male specific cancers, only penile cancer is strongly associated with smoking[2] as the carcinogens are excreted in the urine. These carcinogens can accumulate under the foreskin if it is not cleaned regularly. The evidence of there being a link between testicular[3] and prostate cancer is less clear cut. Yet with regard to both these tumours, those who smoke heavily have an increased risk of developing the more malignant version. Apart from asbestos and certain bacterial or viral infections, evidence about other carcinogens is less clear. Trying to avoid or minimise exposure to these increases your chances of fighting off male cancer.

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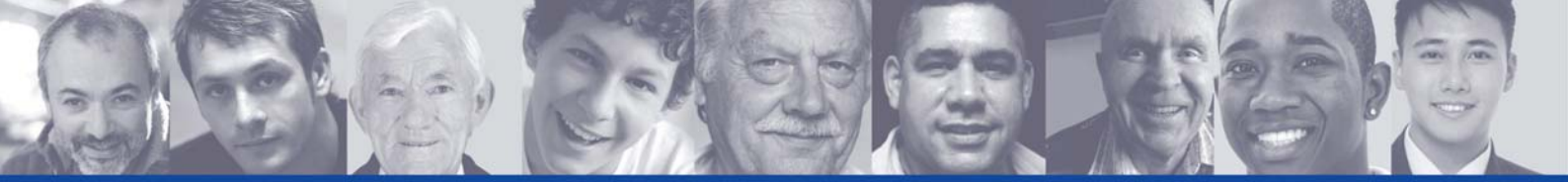


There is also evidence that specific sexually acquired **infections** can increase the risk of testicular, prostate and penile cancer which are avoided by practising **safe sex**. Infections, especially if prolonged, have the ability to cause damage to cell DNA. The Human Papilloma Virus (HPV) is a common sexually transmitted disease that causes genital warts. Certain strains are known to initiate cervical cancer, possibly penile[4] and prostate cancer. There is a loose association with reoccurring Prostatitis (inflammation of the prostate, often with no symptoms) causing prostate cell DNA mutation, potentially leading to prostate cancer[5]. Early sexual activity and unprotected sex can increase the risk of infection. The Mumps virus has also been associated with testicular cancer[6 7 8].

There is some evidence to suspect that a high consumption of **red meat and dairy produce** is associated with some forms of prostate cancer development[9 10 11]. This could be due to pesticides ingested from non-organic animal feed and stored in animal fat. Additionally carcinogens are known to be produced by heating fat to high temperatures when burning, frying or barbequing meat. This needs much further research to be conclusive but in light of this research, Professor Oliver, co-founder of Orchid, recommends that men reduce their consumption of red and processed meat and dairy, that they eat organic where possible and **don't overcook, fry or barbeque meat**. Results from a Canadian study in 2003 also suggested that high dairy product intake, in particular high intake of cheese, is associated with an elevated risk of testicular cancer[12].

As far back as 1790 it was noticed that chimney sweeps with close skin exposure to **carcinogenic chemicals** in soot and poor hygiene had a higher incidence of testicular cancer. **Genital hygiene** continues to be important, but less relevant, in the prevention of male cancers today.

The development of cancer is a long and complicated process and no cancer is associated with one risk factor alone. The majority of people exposed to one known risk factor do not get cancer but it is the interaction between risk factors which increases the risk. So why risk it?

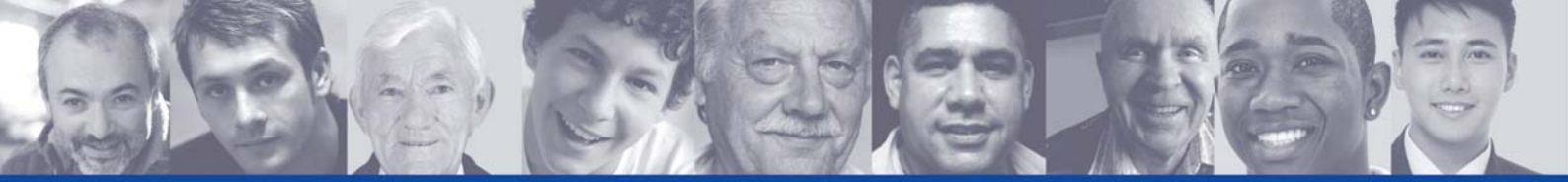
2. *Improve detoxification* (breaking down) *and excretion pathways to remove carcinogens from the body*

This is a complex process but here are some simple ways you can support it:

Dietary fibre, contained in all plant and grain cell walls (removed when refined), is known to aid excretion of waste products and carcinogens from our body each day. Try to eat plenty of **fruit and vegetables** with their skins on and include a range of unprocessed **whole grains** in your meals such as brown rice, oats, rye, spelt, quinoa, millet, buckwheat, bulgar wheat, amaranth, kamut or pearl barley. Recipe ideas can be found at www.wholegrainscouncil.org.

Drink plenty of water. The human body is made up of about 70% water essential for normal body functioning, aiding digestion, excretion and helping the kidneys flush out waste and toxins. The Food Standards Agency recommends we drink 1 to 2 litres of water a day, or more if you are exercising or working in a hot environment[13].

Cruciferous vegetables (broccoli, cauliflower, cabbage, brussel sprouts, kale, pak choi) and **soya products**, are believed to aid detoxification and excretion of hormones that play an important role in the development and spread of male cancers[14]. Limited research has shown their protective effect on prostate cancer. Adding garlic, onions and turmeric



to your cooking and drinking at least 1 cup of green tea a day could help detoxification.

3. *Reduce damage to cell DNA by increasing antioxidant intake*

Healthy cells turn cancerous when the DNA within them is disrupted or altered by mutation. One class of compounds that can do this are known as 'free radicals', disrupting control of cell division and possibly triggering cancer growth. Antioxidants are nutrients found in plant foods that can neutralise these harmful 'free radicals' possibly preventing this initial cell damage. The most important antioxidant nutrients to include in your diet are **vitamins A, C and E, Zinc and Selenium**. Each has been shown in individual studies to have likely beneficial effects on the reduction of risk of prostate cancer in particular. However, further research is needed in these areas.

A diet rich in **fruit and vegetables in a rainbow of colours** especially purple, green, red and blue increases your antioxidant intake. It seems the darker the colour, the higher the antioxidant content of the food. Levels are especially high in **berries** due to their bioactive compound phenols (cranberries, blueberries, blackberries, raspberries, strawberries, cherries, gooseberries, acai, maqui, goji, chokeberry, elderberry), **seeds** (especially flax seeds due to their bioactive compound lignan), **nuts** (pecans, walnuts, hazelnuts, pistachios, almonds, cashews), **pulses** (kidney beans, black beans, pinto beans, soya beans, lentils). Other fruit and vegetables high in antioxidants are artichokes (especially high in polyphenols), pears, plums, apples, peaches, figs, apricots, cabbage, broccoli and sweet potatoes[15].

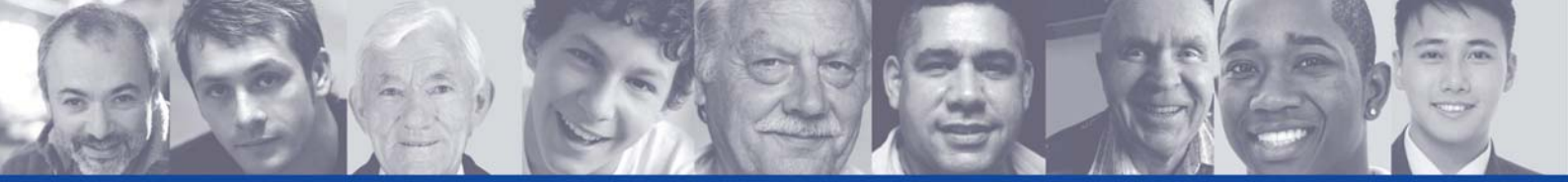
In order of their highest values, the following **herbs and spices** are extremely beneficial to cook with, dried or fresh; cloves, cinnamon, oregano, turmeric, cumin, parsley, basil, curry powder, sage mustard seeds, ginger, pepper, thyme, marjoram, chilli powder, paprika, tarragon, peppermint, garlic, lemon balm, coriander, dill and cardamom[16].

There is accumulating evidence to support the consumption of **lycopene** as a protective factor against prostate cancer by increasing cell DNA resistance to free radical damage[17] [18]. Lycopene can be found in tomatoes, cooked tomato-based products and in lower quantities in red oranges, guava, papaya, watermelon and pink grapefruit. One study showed that men consuming at least 10 servings of tomato-based foods a week had a 50% less chance of developing prostate cancer, where as those consuming 4 to 7 servings per week had a 20% less risk[19].

The bioflavonoid, **quercetin**, a potent antioxidant, has been shown in some studies to inhibit the growth of and to encourage the destruction of prostate cancer cells[20]. This is found in cauliflower, cabbage, apples, berries, red onions, nuts and seeds[21].

Green tea contains powerful antioxidants called **polyphenols**, which may help protect against the development and growth of prostate cancer. Why not replace your conventional tea or coffee with a cup of green tea?

Limited evidence has suggested that **isoflavones** found in soya can decrease the risk of prostate cancer[22] [23]. Soya is best eaten in its traditional form such as tofu, miso, tempeh, and milk made directly from soya beans. Soya beans along with almonds, broccoli and green leafy vegetables have the added benefit of being a good source of calcium[24].



The UK Government currently recommends eating 5 portions of different fruits and vegetables every day[25]. A portion is approximately 80g – a palm size of your hand is a good indication. Some researchers believe, and the Canadian government and US National Cancer Institute recommend that this goal should be increased to 7 to 10 servings per day[26] [27]. You can juice them, eat them raw, lightly steam or stir-fry them to get the best results.

Try creating your own delicious mid-morning drink.

Tripple Berry Smoothie	**Green Juice**
1/2 cup blueberries 1/2 cup raspberries 1/2 cup strawberries 1 banana 1/2 cup natural or soy yoghurt 1 cup ice cubes Blend the banana, yogurt and ice cubes, add the berries and blend until smooth.	1 apple 1 cucumber 3 celery stalks Juice of ½ a lemon Place ingredients in a juicer, juice and pour directly into a glass.

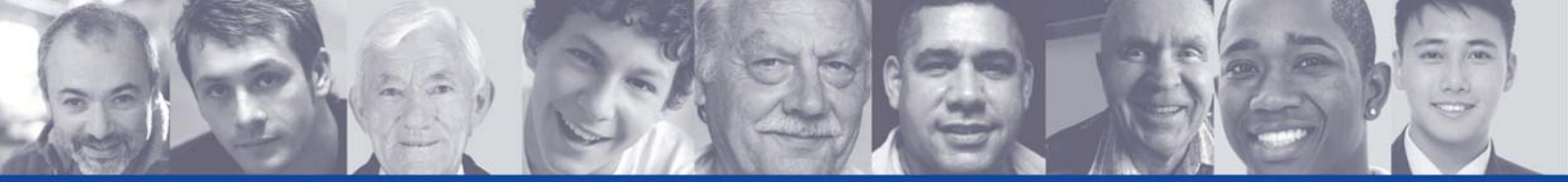
4. *Strengthen your immune system and reduce disruption to the cell DNA repair system to inhibit cancer development*

The immune system's T and B lymphocytes, macrophages and natural killer cells are the front-line of the body's defences against cancer cell spread, and are capable of destroying them. Yet, it is the cancer cells that learn to evade these defences which develop into a tumour. This development can take anything from 10-60 years for most cancers.

Recent studies have indicated **vitamin D**'s role in maintaining a healthy immune system. Though this is mainly important for controlling respiratory infections such as TB and flu, it may also be involved in resistance to certain HPV strains discussed earlier. Prostate cancer patients have been shown to have low circulating blood levels of vitamin D[28] [29] [30] and as well as causing prolongation of any infection in the prostate, this deficiency causes prostate cells to reduce their normal function and be more likely to proliferate[31]. About 90% of the body's vitamin D comes from natural sunlight and the remainder from some food sources. Professor Oliver, co-founder of Orchid, recommends eating **oily fish** (mackerel, herring, kippers, salmon, sardines, tuna, halibut): the best food sources of vitamin D, 2 to 3 times a week throughout the year and getting 10 to 20 minutes of **natural sunlight** on hands and face a day. This is all the sunlight the average Caucasian person requires. Those with especially fair skin may need no more than the minimum, whereas darker skinned individuals need much more exposure. It is sun-burn and persistent long term exposure of the skin to sun that has been shown to lead to skin cancer. (See Orchid Factsheet No 2)

Eating foods high in **vitamins A, C and E**, the minerals **zinc** and **selenium**, **essential fatty acids** (EFA's) and a well balanced **protein** intake are believed to be essential for healthy immune function[32]. These can be found in the following foods[33]:

Vitamin A	Apricots, carrots, green leafy vegetables, liver, mint, egg yolk, dairy products
Vitamin C	Most fruits and vegetables, particularly high in guava, blackcurrants, kiwi, mango, pineapple, brussel sprouts, peppers, cabbage, broccoli, cauliflower and sweet potatoes



Vitamin E	Oils (wheat germ, soybean, sunflower seed), nuts (especially walnuts, almonds, hazelnuts, cashews) seeds (especially sunflower), egg yolk, lima beans, sweet potatoes
Zinc	Oysters, sesame, sunflower and pumpkin seeds, sea food, peppers, egg yolk, ginger, herring, sardines, lamb & whole grains
Selenium	Alfalfa sprouts, broccoli, brazil and cashew nuts, crab, celery, eggs, fish especially mackerel and tuna, garlic, wholegrain cereals, onions, turnips, chicken
Essential Fatty Acids (EFA's)	Oily fish (mackerel, salmon, sardines, tuna, trout, herring, cod), unsalted/unroasted nuts, seeds (sesame, sunflower, pumpkin, flax), salad oils (flax oil, hemp oil, olive oil, sesame seed oil, walnut oil), avocado, seawed, tofu
Protein	Beans, lentils, peas, wholegrain cereals especially oats and brown rice, nuts, seeds, tofu, fish, seafood, meats, dairy products, yoghurt, asparagus, bananas, avocado

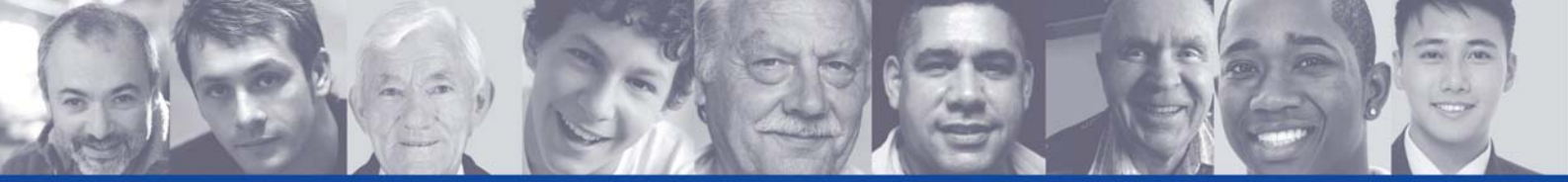
Garlic is believed to have strong anti-microbial properties (ability to fight off bacteria and viruses), and to boost the immune system. A Danish study in 1994 indicated garlic's ability to inhibit the growth of cancerous cells[34]. Crush or chop it to release the active ingredient and try to cook it as little as possible – add at the end of cooking or straight onto food. Some believe that cooking with onions, garlic, ginger, star anise, chilli and shitake mushrooms will boost the immune system.

The effect of high cortisol levels (caused by physiological or psychological **stress)**, in reducing immune function has been well documented[35] [36]. Not only do high cortisol levels reduce the function of our white blood cells but stress also increases the speed of cell DNA replication which could lead to possible cell mutation. While our nervous system works hard to control the effects of a busy lifestyle there is less attention paid to other important systems in our body such as the immune system. The body is designed to deal with short term stress. It is continuous unrelenting stress that causes damage as the body needs time to repair. To reduce internal and external stress on the body where possible, be sure you take some quiet 'you' time each day, a relaxing bath before bed, yoga, massage, breathing exercises or take a walk outdoors.

There is growing evidence that getting a good night's **sleep** of approximately 7 hours is necessary to support a healthy immune system[37] [38] [39].

Excess body fat, amongst other things, can impair our immune system by reducing our levels of natural killer cells that are needed to destroy cancerous cells[40] [41] [42]. Exercise will help to reverse this. **Regular exercise** especially from a young age also has a beneficial effect on the regulation of sex hormones and is believed to reduce the risk of prostate and testicular cancer. A sedentary lifestyle, particularly in tight underpants can heat up the testicles, known to damage sperm cells which could lead to testicular cancer development[43] [44] [45]. Moderate exercise is advised at least 3 times a week, developing a regular pattern and maintaining it over a lifetime.

Alcohol, amongst other things, has also been shown to reduce the production of natural killer cells. Consumption should be kept within NHS guidelines of under 2 to 4 units a day.



Q. I have recently been told by a friend that I should cut down on **dairy products** such as milk and cheese to reduce my risk of getting prostate cancer. I always assumed these where good for you. Is this true?

A. High levels of growth factors (essential for growth in children and calf's but required less in adults) have been found in the cells of prostate cancer patients. They are known to disrupt cell division cycles, leading to proliferation of prostate cancer cells in particular[46]. A few researchers believe that the high levels of growth factors (IGF-1) found in dairy products could be the cause of this[47]. This is an area of debate which you may want to research further. Many dairy-free alternatives are now available and can be purchased in all main supermarkets and health food stores, such as almond, oat, rice or soya milk. Olive oil could be used in cooking rather than butter.

Conclusion

Below is a summary of the main points covered in this factsheet. Following all or some of the recommendations will not only benefit your overall well-being but may help to reduce your risk of developing male cancer:

Diet

- Eat 7 to 10 portions of fruit and vegetables a day in a rainbow of colours
- Cook with a range of herbs and spices
- Aim to eat oily fish 3 times a week
- Include fibre rich whole grains in your meals
- Include a range of plant based protein in your diet
- Limit consumption of red and processed meats to once a week
- Drink 1 to 2 litres of water a day

Lifestyle

- Enjoy the outdoors and try to get 10 to 20 minutes of sunshine a day
- Introduce relaxation techniques into your daily routine
- Try to get 7 hours sleep a night
- Exercise moderately, at least 3 times a week
- Keep consumption of alcohol to under 2 to 4 units a day
- Avoid smoking altogether
- Practise safe sex

If you are worried about any of the male cancers we advise you to discuss this with your doctor.

Further Information:

You may find the following organisations helpful:
www.bbc.co.uk/food/recipes - recipe suggestions using plant based proteins
www.wholegrainscouncil.org – wholegrain recipe ideas
www.units.nhs.uk – NHS alcohol guidelines
www.5aday.nhs.uk – NHS fruit and vegetable guidelines
www.wcrf-uk.org – World Cancer Research Fund offers information on cancer and diet
www.nutrition.org.uk – British Nutrition Foundation gives information on a healthy diet and its links to cancer

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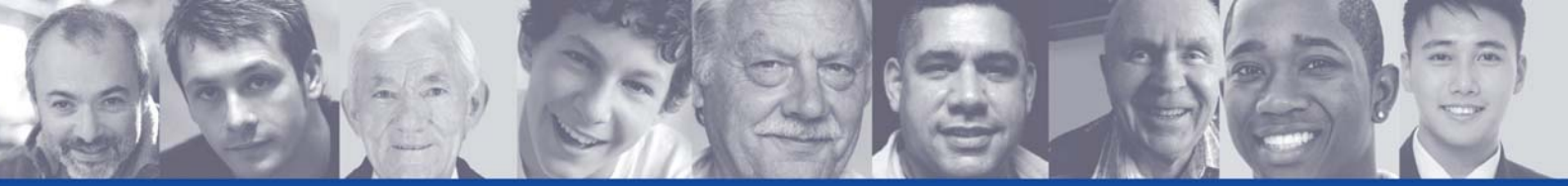

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