



Wise up
on water!

Water and cancer
prevention

Introduction

Next time you feel thirsty - have a drink of water. Not only will you be quenching your thirst, but you will also be helping to protect yourself against three of the biggest killer cancers.

During our lifetime one in three of us will be diagnosed with cancer and one in four will die from cancer. Of the many different types of cancer, the four most common are cancer of the breast, lung, large bowel and prostate. These four alone account for over half of all cases diagnosed. They are also reflected in the most common causes of cancer death. In 2002, 22 per cent of all cancer deaths were from lung cancer, followed by cancer of the large bowel (10 per cent), breast cancer (8 per cent), and prostate cancer (6 per cent).¹ Research suggests that drinking enough water every day, could reduce your risk of developing cancer of the large bowel, breast and prostate.

Cancer of the large bowel

Large bowel cancer, or colorectal cancer, is the third most common cancer in men, and the second most common cancer in women in the UK. Every year there are 18,500 new cases of colorectal cancer in men, and over 16,000 cases in women.²

Water plays a major role in digestion and gut function and yet it is frequently overlooked in studies considering diet and the risk of cancer of the large bowel. Three studies in which the effect of water was considered, found that people who maintained good levels of hydration had a reduced risk of large bowel cancer compared with people whose water intake was low. The extent to which the cancer risk was reduced varied between the studies. In one study, the risk of colon cancer was reduced by 45 per cent in women and 32 per cent in men who drank four or five glasses of water per day, compared to those who drank only two or less glasses per day.³ In the other two studies the protective effect was found to be greatest for men, with risk reductions for rectal cancer of 92 per cent⁴ and for colorectal cancer 42 per cent.⁵ The studies support the potential beneficial effect of adequate water intake in reducing colorectal cancer risk.

One explanation as to why good hydration protects against large bowel cancer is that water may help to dilute toxic compounds in the bowel and speed up the passage of stools so that any harmful substances (carcinogens) spend less time in contact with the bowel lining.

The cancer-protective benefits do not appear to be due to the source of water consumed, but it is possible that other unidentified lifestyle or dietary factors are relevant.⁶

Breast cancer

Breast cancer claims the lives of over 13,000 women a year – 8,000 pre-menopausal women are diagnosed, of which 15 per cent are from the 20-30 age group.⁷ Most women would welcome any opportunity to reduce their chances of developing breast cancer. Drinking

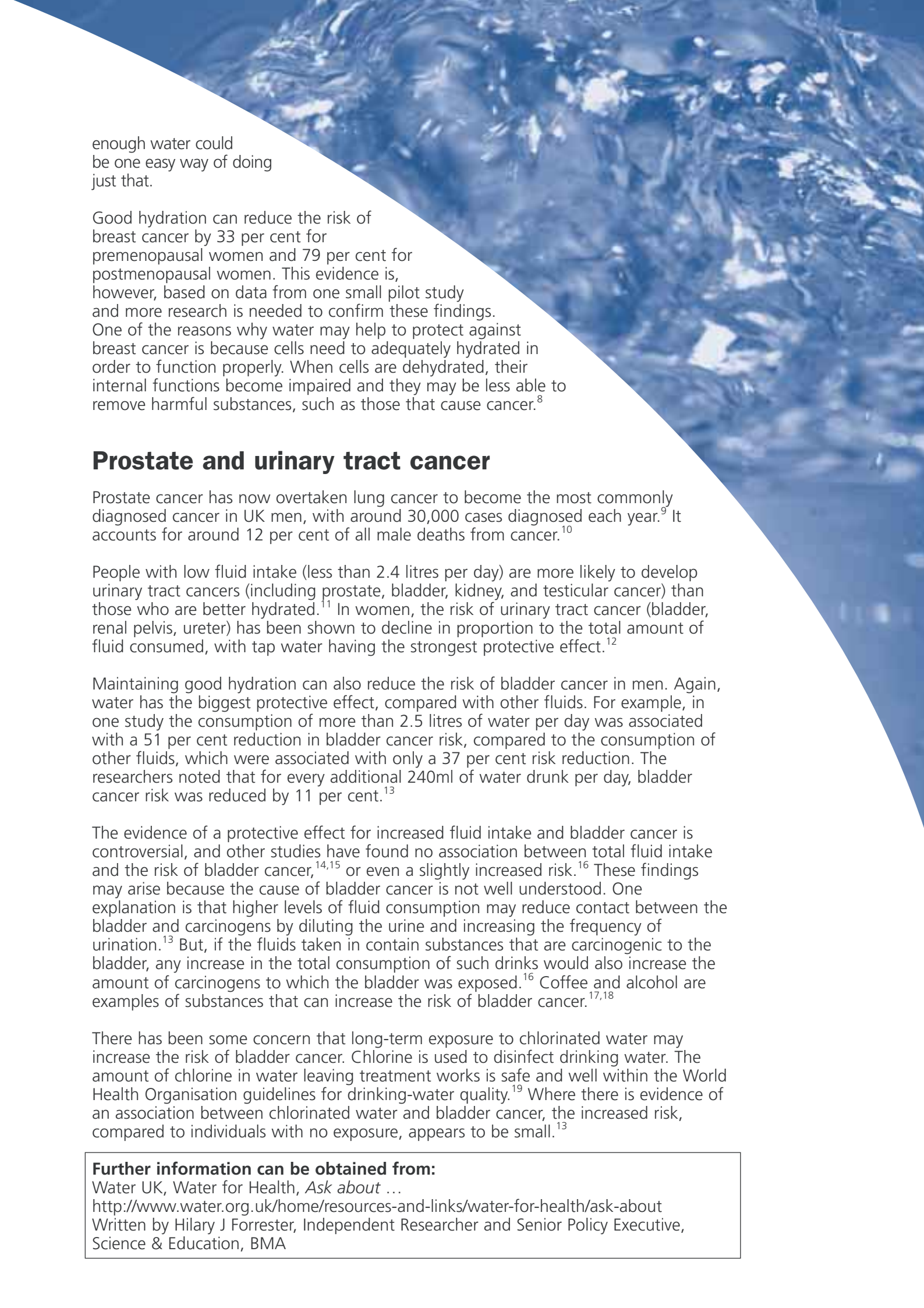


- 1** On a sedentary day, try to drink around two litres of water.
- 2** Start by drinking a glass of fresh water when you get up in the morning.
- 3** If you are not used to drinking water regularly, try initially replacing just one of your other drinks a day with fresh water, increasing your consumption as the weeks go by.
- 4** Ask for a glass of tap water to go with your coffee and tea in cafes.
- 5** Drink a glass of water before and during each meal.
- 6** Hot water with a piece of fruit in - like lemon, lime, orange etc.- often helps those who want a hot drink.
- 7** Carry a bottle filled with chilled tap water with you whenever you leave the house.
- 8** During exercise, drink at 10 to 15 minute intervals or think of it as a full glass every 30 minutes - drink slowly and drink early, it's physically easier to do this when you are still feeling fresh.
- 9** Keep a check on your urine. As a general guide to hydration, it should be plentiful, pale in colour and odourless.
- 10** Ask for a jug of iced tap water with your meal when in restaurants and with your alcohol when in bars – good establishments will be happy to provide this.

All relevant medical practice and care guidance must be observed before considering these suggestions.

In conclusion ...

The benefits of good hydration to protect against cancer have not been well studied and the current findings are considered to be inconclusive.⁶ More research is urgently needed in this area. The evidence that does currently exist, suggests that good hydration makes good sense as part of a healthy lifestyle. Most of us would agree that any opportunity to protect ourselves against three of the biggest cancer killers would be well worth taking.



enough water could
be one easy way of doing
just that.

Good hydration can reduce the risk of breast cancer by 33 per cent for premenopausal women and 79 per cent for postmenopausal women. This evidence is, however, based on data from one small pilot study and more research is needed to confirm these findings. One of the reasons why water may help to protect against breast cancer is because cells need to be adequately hydrated in order to function properly. When cells are dehydrated, their internal functions become impaired and they may be less able to remove harmful substances, such as those that cause cancer.⁸

Prostate and urinary tract cancer

Prostate cancer has now overtaken lung cancer to become the most commonly diagnosed cancer in UK men, with around 30,000 cases diagnosed each year.⁹ It accounts for around 12 per cent of all male deaths from cancer.¹⁰

People with low fluid intake (less than 2.4 litres per day) are more likely to develop urinary tract cancers (including prostate, bladder, kidney, and testicular cancer) than those who are better hydrated.¹¹ In women, the risk of urinary tract cancer (bladder, renal pelvis, ureter) has been shown to decline in proportion to the total amount of fluid consumed, with tap water having the strongest protective effect.¹²

Maintaining good hydration can also reduce the risk of bladder cancer in men. Again, water has the biggest protective effect, compared with other fluids. For example, in one study the consumption of more than 2.5 litres of water per day was associated with a 51 per cent reduction in bladder cancer risk, compared to the consumption of other fluids, which were associated with only a 37 per cent risk reduction. The researchers noted that for every additional 240ml of water drunk per day, bladder cancer risk was reduced by 11 per cent.¹³

The evidence of a protective effect for increased fluid intake and bladder cancer is controversial, and other studies have found no association between total fluid intake and the risk of bladder cancer,^{14,15} or even a slightly increased risk.¹⁶ These findings may arise because the cause of bladder cancer is not well understood. One explanation is that higher levels of fluid consumption may reduce contact between the bladder and carcinogens by diluting the urine and increasing the frequency of urination.¹³ But, if the fluids taken in contain substances that are carcinogenic to the bladder, any increase in the total consumption of such drinks would also increase the amount of carcinogens to which the bladder was exposed.¹⁶ Coffee and alcohol are examples of substances that can increase the risk of bladder cancer.^{17,18}

There has been some concern that long-term exposure to chlorinated water may increase the risk of bladder cancer. Chlorine is used to disinfect drinking water. The amount of chlorine in water leaving treatment works is safe and well within the World Health Organisation guidelines for drinking-water quality.¹⁹ Where there is evidence of an association between chlorinated water and bladder cancer, the increased risk, compared to individuals with no exposure, appears to be small.¹³

Further information can be obtained from:

Water UK, Water for Health, *Ask about ...*

<http://www.water.org.uk/home/resources-and-links/water-for-health/ask-about>

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- 1 Cancer statistics from: Cancer research UK: <http://www.cancerresearchuk.org/>
Office for National Statistics: <http://www.statistics.gov.uk/default.asp>
Breast cancer care: <http://www.breastcancercare.org.uk/Breastcancer/Breastcancerfactsandstatistics>
- 2 Cancer research UK. Specific cancers. Bowel (colorectal) cancer. Page updated 20/12/2004.
http://www.cancerresearchuk.org/aboutcancer/specificcancers/colorectal_cancer?version=1
- 3 Shannon J, White E, Shattuck AL, Potter JD. Relationship of food groups and water intake to colon cancer risk. *Cancer Epidemiology, Biomarkers & Prevention* 1996;5:495-502
- 4 Tang R, Wang J-Y, Lo S-K and H L-L. Physical activity, water intake and risk of colorectal cancer in Taiwan: a hospital-based case-control study. *International Journal of Cancer* 1999;82:484-9
- 5 Slattery ML, Caan BJ, Anderson KE and Potter JD. Intake of fluids and methylxanthine-containing beverages: association with colon cancer. *International Journal of Cancer* 1999;81:199-204
- 6 Altieri A, La Vecchia C and Negri E. Fluid intake and risk of bladder and other cancers. *European Journal of Clinical Nutrition* 2003;57 (Suppl 2):S59-S68
- 7 Breast Cancer Care. Breast Cancer Facts and Statistics. Statistics updated October 2004.
<http://www.breastcancercare.org.uk/Breastcancer/Breastcancerfactsandstatistics>
- 8 Stookey JD, Belderson PE, Russell JM, Barker ME. Correspondence re: J. Shannon et al. Relationship of food groups and water intake to colon cancer risk. *Cancer Epidemiology, Biomarkers & Prevention* 1997;6:657-658
- 9 Cancer research UK. Specific cancers. Prostate cancer. Page updated 20/12/2004.
<http://www.cancerresearchuk.org/aboutcancer/statistics/incidence?version=1>
- 10 Cancer research UK. Statistics. Mortality. Page updated 12/01/2005
<http://www.cancerresearchuk.org/aboutcancer/statistics/mortality?version=1>
- 11 Bitterman WA, Farhadian H, Abu S-C, Lerner D, Amoun H, Krapf D, Makov UK. Environmental and nutritional factors significantly associated with cancer of the urinary tract among different ethnic groups. *Urologic Clinics of North America* 1991;18:501-8
- 12 Wilkens LR, Kadir MM, Kolonel LN, Nomura AM, Hankin JH. Risk factors for lower urinary tract cancer: the role of total fluid consumption, nitrites and nitrosamines, and selected foods. *Cancer Epidemiology, Biomarkers & Prevention* 1996;5:161-166
- 13 Michaud DS, Spiegelmann D, Clinton SK, Rimm EB, Curham GC, Willett WC. Fluid intake and the risk of bladder cancer in men. *New England Journal of Medicine* 1999;340:1390-7
- 14 Risch HA, Burch JD, Miller AD, Hill GB, Steele R, Howe GR. Dietary factors and the incidence of cancer of the urinary bladder. *American Journal of Epidemiology* 1988;127:1179-91
- 15 Bruemmer B, White E, Vaughn TL, Cheney CL. Fluid intake and the incidence of bladder cancer among middle-aged men and women in a three-county area of western Washington. *Nutrition and Cancer* 1997;29:163-8
- 16 Geoffroy-Perez B, Cordier S. Fluid consumption and the risk of bladder cancer: results of a multicenter case-control study. *International Journal of Cancer* 2001;93:880-887
- 17 Clavel J, Cordier S. Coffee consumption and bladder cancer risk. *International Journal of Cancer* 1991;47:207-12
- 18 Kunze E, Chang-Claude J and Frentzel-Beyme R. Life style and occupational risk factors for bladder cancer in Germany. A case-control study. *Cancer* 1992;69:1776-90
- 19 Drinking Water Inspectorate. Information leaflets. Chlorine, smell, taste. Updated 10 July 2002.
<http://www.dwi.gov.uk/pubs/chlorine/index.htm>



Water UK represents UK water and wastewater service suppliers at national and European level.

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