

Public health

To avoid the Big C, stay small

The best ways to prevent cancer look remarkably like those needed to prevent obesity and heart disease as well

Nov 1st 2007 | From the print edition

EVERY day there are new stories in the tabloids about the latest link, sometimes tenuous, sometimes contradictory, between cancer and some aspect of lifestyle. If this is a recipe for confusion, then the antidote is probably a weighty new tome from the World Cancer Research Fund (WCRF). It is the most rigorous study so far on the links between food, physical activity and cancer—and sets out the important sources of risk.

Individually (except for smoking) these risks are quite small. However, many a mickle makes a muckle, and in total they add up to something significant. Roughly speaking, smoking is responsible for a third of cancers (smoking 20 cigarettes a day increases your risk of lung cancer 20-fold), poor food and lack of exercise result in another third, and other causes account for the rest. Some of this last third are known: genetic predisposition, ultraviolet sunlight, pollutants such as pesticides, and other factors including cosmic radiation and a naturally occurring radioactive gas called radon. But the picture is undoubtedly incomplete.

The research has taken six years, involved nine research institutes,

and examined more than half a million publications—which were whittled down to 7,000 relevant ones. From these, the new guidelines spring. Few come as news (see table), but the most surprising is the degree to which even being a bit overweight is a risk. One of the most important things a person can do to avoid cancer is to maintain a body mass index (BMI) of between 21 and 23. According to the WCRF's medical and scientific adviser, Martin Wiseman,

Risk analysis	
How to reduce cancer risk (excluding smoking)	
Body fatness	Be as lean as possible within the normal range of body weight, BMI 21-23
Physical activity	Be physically active, e.g. brisk walking at least 30 mins a day
Foods and drinks that promote weight gain	Limit consumption of energy-dense foods. Average energy intake should be 125kcal/100g of food. Avoid sugary drinks
Plant foods	Eat mostly foods of plant origin: fruits & non-starchy vegetables at least 600g a day
Animal foods	Limit intake of red meat, no more than 300g a week Avoid processed meat including bacon and ham
Alcoholic drinks	Limit alcoholic drinks, two a day for men and one a day for women
Preservation, processing and preparation	Limit consumption of salt to less than 5g a day. Avoid mouldy cereals and pulses
Dietary supplements	Aim to meet nutritional needs through diet alone
Breastfeeding	Mothers to breastfeed; children to be breastfed
Cancer survivors	Follow the recommendations for cancer prevention

Source: World Cancer Research Fund

each five BMI points above this range doubles the risk of post-menopausal breast cancer and colorectal cancer.

For those unfamiliar with BMI, it is calculated by dividing a person's weight in kilograms by the square of his height in metres. Until now, a healthy BMI has been thought of as being between 18.5 and 24.9. The report implies that this range should be narrowed. It is not enough to avoid being clinically obese, or even just a bit overweight. To minimise your risk of cancer, you have to avoid getting fat at all.

Indeed, paying attention to what you eat and drink seems to be the report's watchword. The list is depressingly familiar from injunctions relating to what is coming to be known as metabolic syndrome (obesity, late-onset diabetes, high blood pressure, heart disease and kidney failure, which are starting to look like symptoms of a single, underlying problem). Why cancer and metabolic syndrome might be connected is not yet clear. Cancer is caused by mutational damage to genes that otherwise hold a cell's reproductive cycle in check, and thus stop that cell proliferating. Metabolic syndrome, as its name suggests, seems to be related to the way cells process fats and sugars. There may be no direct link. But it may be that metabolic syndrome involves the production of growth-stimulating molecules that help cancers along.

On the matter of the miscellaneous final third, Devra Davis, an epidemiologist at the University of Pittsburgh and the author of a new book* (#footnote1) on cancer, argues that more attention needs to be paid to pollutants and chemical hazards. Few Americans, she says, are aware that the roofs of 35m homes may be insulated with material containing asbestos (which is linked to a cancer called mesothelioma). She observes that a forthcoming report from America's Government Accountability Office will criticise the government for its lack of public warnings about such risks.

There is also concern in America about the overuse of medical X-rays, especially in emergency rooms. Not many people, for example, are aware that computerised tomography (CT) scanning uses large doses of X-rays. A scan of a baby's head is equivalent to between 200 and 600 chest X-rays. However, Dr Wiseman says these risks account for a trivial number of cancers and guesses the remainder are also something to do with nutrition.

Risky business

With hazards everywhere, plus the complications of genetic predisposition and age, it is hard for someone to work out his actual risk of developing either cancer or metabolic syndrome. If that is a recipe for inaction—as it often is—there may be a solution in the form of a personalised

health check-up called the PreventionCompass.

This system has been developed by the Institute for Prevention and Early Diagnostics (NIPED), a firm based in Amsterdam. It requires the customer to answer a detailed questionnaire about his way of life and to undergo a series of tests. It draws its conclusions by running the results through a “knowledge system”—a database that pools expertise from many sources.

Coenraad van Kalken, NIPED's founder, says his scientists have programmed in risk factors for cancer, cardiovascular disease, diabetes, kidney disease, lung disease, “burn-out”, depression and other psychological disturbances. The system can, for example, use family history and elevated levels of a particular protein in the blood to work out who should undergo a biopsy to look for prostate cancer. And because it looks at lifestyle as well as biochemistry, it could similarly suggest lower alcohol consumption and a colonoscopy to someone at risk of colorectal cancer.

In the case of this disease, and also breast cancer, such early diagnosis prevents a serious and incurable condition. Bob Pinedo, the director of the Free University medical centre in Amsterdam, told a symposium held by the European School of Oncology in Rome on October 26th that it costs €250,000 (\$360,000) to treat (not cure) a patient with late-stage colorectal cancer for 20 months. In the Netherlands, that would pay for 1,000 colonoscopies.

Given the rising costs of dealing with cancer alone—in America this is more than \$100 billion a year—prevention and early detection look set to take off. In trials of the PreventionCompass that NIPED conducted last year, more than 75% of the staff of four Dutch companies volunteered to join the scheme. Moreover, occupational-health officers in these companies claim that more than half their staff actually made changes to their way of life as a result. Not bad for a system that costs about €100 a year for each employee.

This year two large insurance companies, which provide corporate health-care, income and disability insurance to employees, are offering to lower the premiums of customers who sign up to the PreventionCompass. Next year, the plan is to extend the scheme more widely, by recruiting Dutch GPs to offer it to people from lower-income groups who do not have such private health insurance.

The message, then, is prevention, not cure. And it is a message that needs to be heeded across the world as poor countries grow wealthier and adopt the eating habits and sedentary lives of the rich. It is an irony that evolution has shaped people to enjoy fat, sugar and indolence—things in short supply to man's hunter-gatherer ancestors, and desirable in the quantities then available. Wealth allows them to be indulged in abundance. Unfortunately, human bodies have evolved neither to cope nor, easily, to resist.

* “[The Secret History of the War on Cancer](http://www.amazon.com/Secret-History-War-Cancer/dp/0465015662/theeconomists-20) (<http://www.amazon.com/Secret-History-War-Cancer/dp/0465015662/theeconomists-20>) ”. Basic Books, New York.

From the print edition: Science and technology