

5 Promoting a healthy lifestyle

At a glance

- ▶ Health promotion should start from a young age, encouraging the adoption of a healthy lifestyle.
- ▶ Keep weight within a healthy range with a body mass index of 18.5–25 kg/m².
- ▶ Do not smoke.
- ▶ Keep alcohol intake to under two units per day.
- ▶ Adopt a Mediterranean-style diet.
- ▶ Incorporate 150 minutes of exercise into a weekly routine.
- ▶ Learn how to perform correct pelvic floor muscle exercises during pregnancy and maintain them thereafter.
- ▶ Use sunscreen and protective clothing to prevent sun-induced skin ageing.
- ▶ Discuss risk factors for cardiovascular disease at menopause.
- ▶ Ensure adequate calcium and vitamin D intake for maintenance of healthy bones.
- ▶ Participate in the national cancer screening programmes: cervix, breast and colorectal.
- ▶ Early suspicion of lower abdominal symptoms should prompt a CA125 blood test and onward referral if the result is abnormal.

Population risk

The opportunity to improve health and lifestyles is important at a population level to decrease the costs of health care required for an increasingly ageing population and for the health and wellbeing of individuals. Although age and genetic factors are not modifiable, most other risk factors for cardiovascular disease, which remains the major cause of death in men and women, can be altered.

The INTERHEART Study looked at potentially modifiable risk factors associated with myocardial infarction in 52 countries, using a case-control method, and found that smoking, dyslipidaemia, hypertension or diabetes, abdominal obesity, dietary patterns of daily fruit and vegetable

consumption, regular physical activity, alcohol consumption and psychosocial factors were all significantly associated with a risk of myocardial infarction in all regions of the world.¹ These nine risk factors accounted for 94% of the population attributable risk of myocardial infarction in women.

The Nurses' Health Study noted that there was a gradient of coronary risk, showing that women in the heaviest quartile of body mass index (BMI) – that is, over 29 – had a threefold increased risk of coronary heart disease compared with women with a BMI of 19. The distribution of fat also appears important, with a more android morphology (apple shape) composed of metabolically active fat providing a higher cardiac risk than a more gynoid (pear shape).² National Health Service (NHS) recommendations for the maintenance of optimum health are to achieve and sustain a BMI between 18.5 and 24.9 kg/m² and a waist circumference of less than 76 cm.

Diet

Dietary intake consists of fruit and vegetables, grains, dairy products, and meat or other protein-rich foods. The type of carbohydrate consumed has differing effects on postprandial glucose levels. Diets with a high glycaemic index are associated with increasing risk of developing type 2 diabetes, coronary heart disease and some cancers. High glycaemic index carbohydrates, such as pasta, rice and potatoes, should be replaced with low glycaemic index carbohydrates, such as fruit and vegetables.

Menopausal women should eat a protein-rich diet, as they are less able to use food to build muscle mass compared with men of the same age. This diet should include fish, lean meat, eggs, beans, peas and soy products while avoiding excessive red and processed meat, which has been found to be a risk factor for breast cancer and is associated with increased overall mortality.

There is some evidence that long-term consumption of fish oil and omega-3 fatty acids reduces the risk of cardiovascular disease, probably by lowering plasma triglyceride concentrations. One or two servings of oily fish per week are advised for most adults. Saturated fat intake should be limited to less than 10% of energy intake and replaced with unsaturated fats, which are beneficial to cholesterol profiles. Added sugars should make up no more than 5% of total daily intake, keeping to 30 g per day.

The recommended amount of dietary fibre is 25 g per day for women. Increased fibre intake is associated with decreased risk of cardiovascular events, diabetes, colorectal cancer and all-cause mortality. A diet consisting of whole grains such as brown rice and wholewheat bread,

together with at least five servings of fruit and vegetables daily, should be recommended to provide sufficient fibre content. Dietary sodium intake should be limited to under 2.3 g daily, as higher intakes are associated with the development of hypertension and cardiovascular disease.

The US National Institutes of Health recommended dietary allowance of calcium for postmenopausal women is 1200 mg daily (the National Osteoporosis Society recommend 700 mg/day),^{3,4} ideally by diet, but with supplements in those not able to maintain this level in their diet. Ninety per cent of vitamin D intake is synthesised in the skin as vitamin D₃ (cholecalciferol) through exposure to ultraviolet B sunlight. Ten per cent is ingested in food as vitamin D₂ (ergocalciferol), found in oily fish such as mackerel or tuna, and egg yolk.

The Scientific Advisory Committee on Nutrition produced new guidance in 2016 suggesting a reference nutrient intake of 10 µg/day (400 iu) of vitamin D for the UK general population aged one year and above, not just for at-risk groups.⁵ This is the average vitamin D intake (from natural food sources, fortified food or supplements) needed to achieve a serum concentration of 25-hydroxyvitamin D equal to or greater than 25 nmol/l during the winter in 97.5% of the population.

There is insufficient information about the optimum blood levels of other vitamins, making it difficult to interpret whether they represent a true deficiency state. There is a lack of evidence that vitamin supplements prevent disease in healthy adults with low blood levels of vitamins, apart from those with specific diets or medical conditions. Consuming a diet with over five portions of fruit and vegetables daily should ensure adequate intake of all vitamins and trace elements. Vitamin B₁₂ is obtained through dietary intake (mainly from meat, fish, dairy), absorbed in the gut facilitated by intrinsic factor, which is synthesised by parietal cells in the stomach. Deficiency is caused mainly by inadequate absorption secondary to lack of intrinsic factor, atrophic gastritis, inflammatory bowel disease, gut surgery or drugs that affect absorption (e.g. metformin and proton pump inhibitors). The results of serum vitamin B₁₂ testing should be interpreted in the context of clinical signs and symptoms and the results of other appropriate tests, such as full blood count and liver function tests. There are many limitations of the vitamin B₁₂ assay as it can give false positive or false negative results in around 50% of cases.

Functional foods, which claim to have potential health-promoting benefits or disease-preventing properties have shown promise but there is little supporting evidence for beneficial end points. Data from clinical research demonstrate that soy protein and phytosterols can reduce cholesterol by reducing its gut absorption. More studies are needed,

however, to confirm whether this has an effect on the risk of cardiovascular disease.

The antioxidant vitamins include vitamin A and the carotenoids such as beta carotene, as well as vitamins C and E. Randomised trials that have examined the role of antioxidant supplements in reducing the risk of cancer and cardiovascular disease by boosting the body's ability to get rid of toxic free radicals have generally not found any positive effects.

Exercise

Regular physical exercise is associated with decreased premature death, cardiovascular disease, diabetes, hypertension, colon cancer and obesity, and with a beneficial effect on bones, muscles and psychological wellbeing. A graded relationship between exercise and the development of chronic conditions has been observed in large cohort studies, with benefits seen at up to 100 minutes of moderate exercise per day being associated with a lower morbidity in later years and an increased longevity.

Extended periods of sitting appear to be an independent risk factor for mortality, which does not appear to be ameliorated by undertaking periods of moderate physical exercise.⁶ An Australian study showed an all-cause mortality hazard ratio of 1.4 (95% confidence interval 1.27–1.55) for those individuals sitting for over 11 hours per day compared with those with under four hours of sedentary activity per day.⁷ The World Health Organization recommends at least 150 minutes of moderate intensity aerobic activity or 75 minutes of vigorous intensity activity weekly for all adults. Aerobic exercise induces beneficial effects on lipids (decrease in very low density lipoprotein, LDL, increase in high density lipoprotein) and an improvement in insulin sensitivity, thus reducing the risk of type 2 diabetes and maintaining a lean body mass.

Exercise can provide increased strength, flexibility and balance, with diminished risk of falling. Weight-bearing activity is not only an important factor in the attainment of peak bone mass but also helps to maintain bone mass in later life. Exercise regimens can be very helpful in the management of established osteoporosis and are a component of fall prevention programmes.

Smoking cessation

Smoking is an independent major risk factor for coronary heart disease, cerebrovascular disease and cancer. The incidence of a myocardial infarction is increased sixfold in women who smoke 20 cigarettes a day

compared with subjects who have never smoked. The risk of mortality reduces rapidly upon smoking cessation. One year after stopping, the risk of dying from coronary heart disease is reduced by about 50% and continues to decline over time. Brief interventions by doctors within consultations have been shown to increase cessation rates. The NHS offers a stop smoking support service, which consists of face to face and telephone advice. Pharmacological help is also available as nicotine replacement, such as patches or e-cigarettes and via the centrally acting drugs bupropion and varenicline acting to decrease cravings.

Alcohol

Studies from many countries all seem to agree that moderate drinkers (two units per day for women) generally have lower mortality rates than abstainers or heavy drinkers, although such observational studies of drinking patterns are difficult to free from other confounding variables. There is good evidence, however, that breast cancer risk is higher in women consuming even low levels of alcohol (one unit per day) compared with abstainers, and there appears to be a significant association with total lifetime alcohol intake. The Nurses' Health Study found an additive risk for women using HRT and alcohol compared with women who took neither. The relative risk of breast cancer was doubled in those who drank more than one alcoholic drink per day and used hormones for five or more years. Heavy alcohol use is associated with increased risk of hip fracture by causing both osteoporosis and increasing risk of falls.⁸

Pelvic floor exercises

Pelvic floor exercises aim to strengthen pelvic floor muscles that support and hold up the bladder, uterus and other pelvic organs. Weakening of the pelvic floor muscles occurs with age and as a result of damage during childbirth, repeated straining and the effects of the menopause. As a result, various components of the pelvic viscera can descend (prolapse), causing a variety of pressure and functional symptoms such as urinary incontinence, difficulty evacuating and sexual dysfunction (see Chapter 2).

Pelvic floor exercises are recommended as one of the initial interventions in the prevention and treatment of stress urinary incontinence. Regular pelvic floor exercises can improve symptoms related to pelvic organ prolapse and can lead to improved sexual function. For best results, pelvic floor education should start early and be reinforced during and immediately after pregnancy and maintained regularly thereafter.

Skin

The normal ageing of the skin leads to atrophy and decreased elasticity, with all skin layers become thinner resulting in increased fragility. In addition, the result of chronic sun exposure and recurrent damage by ultraviolet (UV) light is wrinkled, rough skin with telangiectasia and spots of hyper- and hypopigmented skin. An Australian study showed evidence that daily application of broad spectrum (UVA/UVB) sunscreen with a sun protection factor of 15 or higher significantly slows skin ageing, even in middle-aged people.⁹ Health professionals should be encouraging women to use daily sunscreen and to reduce sun exposure with protective clothing, including wide-brimmed hats and UV-blocking sunglasses.

Screening

Preventive health care has become an important aspect of medicine, involving screening of asymptomatic adults to detect risk factors for, or early evidence of, disease that may be preventable. This is only of benefit in areas of health where there is a suitable intervention that can make a difference to the natural history of the disease progression. There are harms associated with screening for all conditions, in particular cancer. These harms include anxiety produced by false positive screening tests, harms associated with further investigations after a positive screening test and overdiagnosis of conditions that may be treated but, if left, would never have become clinically apparent.

Cardiovascular disease risk screening

A woman's absolute risk of having a cardiovascular event over the next 10 years can be assessed using one of the recognised risk calculators (Box 5.1). Those showing a high risk (over 10%) need to be given lifestyle advice on stopping smoking and keeping alcohol intake to within the healthy limits for women, and increasing daily exercise levels, while adhering to a healthy diet to optimise body weight. If no improvement in risk score is achieved, treatment needs to be initiated to ensure that blood pressure, weight and lipids are optimally controlled, as these interventions have been shown to decrease the incidence of cardiovascular disease in these patients.

The use of aspirin for primary prevention of myocardial infarction for at-risk women aged 65–74 years found that the number needed to treat was 1520 to prevent one infarction and the number needed for harm was

Box 5.1**Cardiovascular disease risk calculators**

QRISK2	qrisk.org
JBS3	jbs3risk.com

108 to induce one major gastrointestinal bleed, going against the use of aspirin to prevent myocardial infarction in women.

The Cholesterol Treatment Trialists Collaboration performed meta-analyses on data from 27 trials of statin therapy compared with controls and confirmed that statins reduced the risk of major vascular events by 21% for each 1.0 mmol/l reduction in LDL cholesterol in women, emphasising that women will gain equal benefit from being treated when they reach the same cardiovascular risk thresholds as men.¹⁰

Cervical screening

Figures from the NHS cervical cancer screening programme have shown that the incidence of cervical cancer in England has decreased by nearly 50% since the start of the programme in 1998, with mortality from cervical cancer dropping by 63%, reflecting the long-term benefits of screening. Cervical screening is offered to all women 25–50 years every three years and 50–64 years every five years. In women under 25 years, smears are less specific, as lots of false positive results are generated from the high levels of transient infections seen in this population, which subsequently resolve spontaneously. Hence, the decision to raise the age of starting screening in an attempt to eradicate the increased levels of additional investigation required in this age group.

One in twenty smears taken will have abnormal cells, necessitating further investigation. Smears showing cervical intraepithelial neoplasia (CIN) grade 2 or 3 changes will be referred for further colposcopic examination. Those showing mild abnormalities (CIN1) will be tested for human papillomavirus (HPV) and only those showing evidence of high-risk HPV types will be referred to colposcopy. If there is no evidence of HPV virus they can return to normal recall. After treatment of CIN, the HPV status at 6 months predicts residual disease. Those smears that are cytologically and HPV negative can return to normal recall.

Encounters with HPV infections are common but most are asymptomatic and disappear within 1–2 years, and do not cause cancer. Persistent infections with high-risk HPV subtypes can persist for many years, leading to cell changes that, if untreated, may progress to cancer.

The HPV vaccine Gardasil® 9 (Sanofi Pasteur) has been included as part of the NHS childhood vaccination programme and is routinely offered to secondary school girls aged 12 and 13 years of age. Gardasil protects against the two subtypes of HPV 16 and 18 responsible for more than 70% of cervical cancers in the UK, and HPV6 and 11, which are also responsible for 90% of genital warts. The Australian vaccination programme has already seen almost 50% reduction in the incidence of high-grade cervical abnormalities in girls under 18 years of age since its inception.

Breast screening

Breast cancer remains the most common cancer in women and its incidence continues to rise. Mortality is falling, however, as a result of earlier diagnosis through the breast screening programme, improved surgical techniques, improved delivery of radiotherapy and better adjuvant medical therapy.

Apart from any risks of the radiation dose involved in the screening procedure itself, screening for breast cancer can cause increased morbidity when false positive results occur. Approximately 10% of screening mammograms require additional evaluation; the lesion turns out to be benign in more than 90% of cases. In addition, women may suffer harm if breast cancer is overdiagnosed and early lesions such as grade 1 ductal carcinoma in situ are found, as there is evidence that many of these lesions will not progress to invasive carcinoma and, therefore, will never be life threatening; 2500 women need to be screened for 10 years to prevent one breast cancer. The independent UK panel on breast cancer screening recently reported on its review of the benefits and harms of the NHS breast screening programme.¹¹ The panel estimated that for every 10,000 women invited for screening from the age of 50 years for 20 years: 681 breast cancers will be discovered; 129 of these will be from overdiagnosis and 43 deaths from breast cancer will be prevented. Thus, for every death prevented, there are estimated to be three cases of overdiagnosis.

Ovarian cancer screening

Although the lifetime risk for ovarian cancer is only 1.39%, it remains the leading cause of gynaecological cancer death in the UK. Each year, nearly 7000 women are diagnosed with ovarian cancer, usually at an advanced stage, culminating in a less than 35% five-year survival rate, which is one of the lowest in Europe. In 2011, the National Institute for Health and Care Excellence (NICE) published a clinical guideline on

the recognition and initial management of ovarian cancer, in an attempt to alert GPs to symptoms that appeared more frequently in the year prior to a diagnosis of ovarian cancer.¹² NICE recommended rapid investigation for any woman aged over 50 years who reported any of the following symptoms frequently or persistently in the past 12 months: abdominal distension, feeling full, early satiety, loss of appetite, pelvic or abdominal pain, increasing urinary frequency, urgency or both, unexplained weight loss, fatigue or changes in bowel habit. They also recommended that the first investigation in primary care should be a CA125 blood test, followed by an ultrasound if the level of CA125 was found to be above 35 iu/ml. Any woman with abnormalities found on pelvic examination or ultrasound or an abnormal CA125 suggestive of cancer should be rapidly referred to a cancer centre via the two-week wait pathway.

The greatest risk factor for ovarian cancer is family history, which is present in 10–15% of women who develop the disease. Other factors are nulliparity, obesity, polycystic ovary syndrome and endometriosis. A reduced risk is seen in women who use the oral contraceptive long term, those who breastfeed and those with post-tubal ligation or hysterectomy with salpingectomy.

There is currently no national screening programme for ovarian cancer in the UK. The UK Collaborative Trial of Ovarian Cancer Screening (UKCTOCS) looked at no screening compared with screening with annual transvaginal ultrasound and multimodal screening consisting of annual CA125 testing with transvaginal sonography (TVS) if the level of CA125 was abnormal. It found that compared with no screening, annual CA125 and TVS showed a nonsignificant trend toward a reduction in mortality from ovarian cancer. When ovarian cancers present at the start were excluded, the mortality reduction with multimodal screening was significant. The results of the UKCTOCS trial are not consistent with results from another randomised trial, which did not show decreased mortality with multimodal screening. Based on the available data, it is not clear that the benefits of screening for ovarian cancer outweigh the harms related to the adverse effects associated with false positive findings.

Colorectal cancer screening

In 2009, 15,000 women were diagnosed with bowel cancer, with nearly 6000 female deaths in 2010. Women have a one in nineteen lifetime risk of being diagnosed with bowel cancer, 52% of which is thought to be lifestyle related, so potentially preventable.

Unavoidable risk factors for bowel cancer are age (80% over 60 years) and family history, with 10% of bowel cancers being due to a gene mutation (e.g. hereditary nonpolyposis colorectal cancer) and inflammatory bowel disease, where cancers develop in areas of dysplasia. Most colorectal cancers arise from adenomas, many of which are polyps that progress from small to large polyps and then to dysplasia and cancer over 10 years. Patients with previous polyps should undergo regular screening colonoscopies to remove further polyps at an early stage.

Avoidable factors include obesity. A systematic review of data involving 37,334 patients reported that each 5 kg/m² increase in BMI was associated with a 9% higher incidence of colon cancer in women. In particular, a diet high in red meat has been shown to increase the risk, via the haem component of iron.¹³ The current Department of Health advice, is that adults who eat more than 90g of red and processed meat a day should reduce their intake to 70g a day. A large number of factors have been reported to be associated with a decreased risk of colon cancer. These include regular physical activity, a high-fibre diet, the regular use of aspirin or nonsteroidal anti-inflammatory drugs and combined hormone replacement therapy in postmenopausal women.

The NHS bowel screening programme invites all women between 60 and 75 years to send a stool sample for faecal occult blood testing every two years. Any woman with a positive test is called for further investigation involving a colonoscopy. This programme has led to a 16% reduction in the risk of dying from bowel cancer.

References

- 1 Yusuf S, Hawken S, Ounpuu S, on behalf of the INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet*, 2004; 364: 937–52.
- 2 Manson JE, Willett WC, Stampfer MJ, Colditz GA, Hunter DJ, Hankinson SE, et al. Body weight and mortality among women. *N Engl J Med*, 1995; 333(11): 677–85.
- 3 National Institutes of Health Office of Dietary Supplements. Calcium Dietary Supplement Fact Sheet. Updated 17 November 2016. Available at <https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional>.
- 4 National Osteoporosis Society. Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management. Bath: National Osteoporosis Society; 2013. Available at <https://nos.org.uk/media/2073/vitamin-d-and-bone-health-adults.pdf>.
- 5 Scientific Advisory Committee On Nutrition. *Vitamin D and Health*. London: Public Health England; 2016. Available at www.gov.uk/government/publications/sacn-vitamin-d-and-health-report.
- 6 Bjørk Petersen C, Bauman A, Grønbaek M, Helge JW, Thygesen LC, Tolstrup

- JS. Total sitting time and risk of myocardial infarction, coronary heart disease and all-cause mortality in a prospective cohort of Danish adults. *Int J Behav Nutr Phys Act*, 2014; 11: 13.
- 7 van der Ploeg HP, Chey T, Korda RJ, Banks E, Bauman A. Sitting time and all-cause mortality risk in 222 497 Australian adults. *Arch Intern Med*, 2012; 172(6): 494–500.
 - 8 Department of Health. *UK Chief Medical Officers' Alcohol Guidelines Review: Summary of the Proposed New Guidelines*. London: Department of Health, 2015.
 - 9 Hughes MC, Williams GM, Baker P, Green AC. Sunscreen and prevention of skin aging: a randomized trial. *Ann Intern Med*, 2013; 158(11): 781–90.
 - 10 Cholesterol Treatment Trialists' (CTT) Collaboration. Efficacy and safety of LDL-lowering therapy among men and women: meta-analysis of individual data from 174 000 participants in 27 randomised trials. *Lancet*, 2015; 385(9976): 1397–405.
 - 11 Independent UK Panel on Breast Cancer Screening. *The Benefits and Harms of Breast Cancer Screening: an Independent review: a report jointly commissioned by Cancer Research UK and the Department of Health (England)*. London: IBSR; 2012. Available at www.cancerresearchuk.org/sites/default/files/breast-screening-review-exec_0.pdf.
 - 12 National Institute for Health and Care Excellence. *Ovarian Cancer: Recognition and Initial Management* (Clinical Guideline CG122). London: NICE; 2011.
 - 13 Karahalios A, English DR, Simpson JA. Weight change and risk of colorectal cancer: a systematic review and meta-analysis. *Am J Epidemiol*, 2015; 181(11): 832–45.

Further reading

- Bang HO, Dyerberg J. Lipid metabolism and ischemic heart disease in Greenland Eskimos. In: Draper H. (ed.), *Advances in Nutrition Research*. New York: Plenum Press; 1980, pp. 1–22.
- Chen WY, Colditz GA, Rosner B, Hankinson SE, Hunter DJ, Manson JE, Stampfer MJ, Willett WC, Speizer FE. Use of postmenopausal hormones, alcohol, and risk for invasive breast cancer. *Ann Intern Med*, 2002; 137(10): 798–804.
- Citak N, Cam C, Arslan H, Karateke A, Tug N, Ayaz R, Celik C. Postpartum sexual function of women and the effects of early pelvic floor muscle exercises. *Acta Obstet Gynecol Scand*, 2010; 89(6): 817–22.
- National Institute for Health and Clinical Excellence. *Urinary Incontinence in Women* (Quality Standard QS77). London: NICE; 2015.