Breast Cancer

Diet & exercise throughout the cancer journey

Andriana Petrova
RD, NMP, Highly Specialist Prehabilitation Dietitian, Barts Cancer Centre, Barts Health NHS Trust

Breast cancer is the most common cancer in the United Kingdom (UK), accounting for 15% of all new cancer diagnoses.[1] Although there are a number of non-modifiable risk factors, 23% of breast cancer diagnoses in the UK are preventable.[1] Diet and physical activity are modifiable factors that can influence outcomes at every stage of the cancer journey – from reducing initial risk, through supporting treatment, to improving long-term survival.[2-4] This article summarises the current evidence and dietary and exercise recommendations.

Prevention

Body composition, lifestyle factors and dietary patterns are known to influence the risk of cancer development.

Body weight

Obesity is thought to influence breast cancer through multiple interconnected pathways, including insulin resistance, which stimulates cancer cell growth, and low-grade chronic inflammation, which promotes tumour development. In postmenopausal women, obesity (body mass index [BMI] ≥30 kg/m^2) and postmenopausal weight gain increase the risk of hormone receptor-positive breast cancer by 30-40%, with each 5 kg/m^2 increase in BMI corresponding to a further increase in risk.[5, 6] Interestingly, higher BMI doesn't seem to increase the risk and may even have protective role in premenopausal women, possibly due to differences in hormonal profile and inflammatory responses in younger adipose tissue.[5, 7] However, this does not justify excess weight gain, given the broader health consequences, known risk of other cancers, and the risk of aggressive tumour biology should breast cancer develop.[8]

It is therefore advised to maintain a healthy BMI throughout adulthood, avoid excessive weight gain after the menopause and, if overweight or obese, aim for gradual, sustained weight loss to reach a healthy weight.[8]

Alcohol

Alcohol is one of the most robustly established dietary risk factors for breast cancer.[6] It increases circulating oestrogen and androgen levels (especially in postmenopausal women), which can stimulate the proliferation of oestrogen receptor-positive (ER+) breast cancer cells. Additionally, when metabolised it forms acetaldehyde, a compound that damages DNA and can lead to carcinogenesis. There is a clear dose–response relationship: even light drinking (as little as one drink per day) is associated with increased risk.[9, 10] All beverage types carry similar risk, and the association is particularly strong for oestrogen receptor-positive and postmenopausal breast cancers.[11] For breast cancer prevention, the safest approach is to avoid alcohol altogether, in line with the updated World Cancer Research Fund (WCRF) Guidelines.[8] If women choose to drink, it is recommended to adhere to the UK guideline of a maximum of 14 units per week, spread over at least three days.[8]

Physical activity

Physical activity is one of the most well-evidenced modifiable lifestyle factors for breast cancer prevention. Data from the UK Biobank prospective cohort showed that the most physically active women had a 16–21% lower risk of breast cancer compared to the least active.[12] This protective effect is observed in both pre- and postmenopausal women and appears independent of BMI, suggesting that exercise exerts protective effects through mechanisms beyond weight management alone – including reductions in circulating oestrogen and insulin, improved immune function, and reduced chronic inflammation.[12, 13] Women should therefore aim for at least 150–300 minutes of moderate-intensity aerobic activity per week (or 75–150 minutes of vigorous-intensity activity), combined with two or more sessions of resistance training, in line with WCRF recommendations.[8]

Dietary patterns & fibre

Overall dietary pattern matters more than any single nutrient, as protective compounds work synergistically through cumulative anti-inflammatory, hormonal and gut microbiome effects.[8] A Western dietary pattern – characterised by high intakes of red and processed meat, refined carbohydrates, ultra-processed foods and saturated fats – is associated with increased breast cancer risk.[14, 15] In contrast, dietary patterns, rich in vegetables, fruits, wholegrains and pulses, are consistently associated with reduced risk.[14, 15]

Dietary fibre deserves particular mention, as it has been shown to reduce circulating oestrogen by limiting reabsorption in the gut – a mechanism of considerable importance given that approximately 70% of breast cancers are oestrogen-driven.[16] In addition, diets high in fibre reduce the risk of weight gain and overweight and obesity, indirectly contributing to reduced cancer risk. Thus, several systematic reviews and meta-analysis have shown that high total fibre consumption is associated with a reduced risk of breast cancer in both pre- and post-menopausal women.[16, 17] A dose response has been observed per additional 10 g/day.[16] Thus, a minimum intake of 30 g of fibre per day is recommended, achievable through wholegrains, pulses, vegetables, fruits, nuts and seeds.[8] Additionally, carotenoid-rich foods (e.g. carrots, sweet potato, red peppers, kale, tomato, pumpkin, butternut squash) may have further positive impact on reduction in the risk of oestrogen receptor-negative breast cancer.[18] Soy foods appear safe and potentially beneficial, and can be incorporated as part of a varied diet.[19] Finally, processed meats – classified by the World Health Organization as Group 1 carcinogens – are associated with increased breast cancer risk and should be avoided or minimised.[8]

Nutrition & exercise during active treatment

Nutrition during treatment

During active treatment, priorities shift fundamentally. Prevention strategies that emphasise restriction are no longer recommended; instead, the focus moves to eating and exercising enough to preserve lean muscle mass, support immune function, and maintain treatment tolerance. Treatment-related side effects – nausea, taste changes, mucositis, and fatigue – frequently compromise oral intake, increasing malnutrition risk. Sarcopenia is common during chemotherapy and is associated with worse treatment tolerance, more severe side effects, treatment delays and poorer outcomes.[20] Thus, protein requirements increase during treatment, and energy restriction is not recommended.[20]

When appetite and tolerance allow, a balanced, nutrient-dense dietary pattern is encouraged and there is research showing Mediterranean, high-protein diets can be safe during chemotherapy.[21] However, where side effects limit intake, strategies should be tailored accordingly to ensure sufficient energy and protein intake for weight and muscle preservation.[20, 21] For example, bland, low-fat, cold or room-temperature foods are often better tolerated when nausea is present; soft, moist foods are appropriate for mucositis. Distributing protein throughout the day, eating small frequent meals 5 to 6 times per day, and choosing higher protein drinks or using oral nutritional supplements when solid food is poorly tolerated, can help meet requirements. Individualised nutritional counselling by a registered dietitian has been shown to improve nutritional intake, maintain lean mass and reduce treatment delays, and referral should be considered where indicated.[21]

Exercise during treatment

Exercise during active treatment is safe and increasingly recognised as an important component of cancer care.[22] A meta-analysis of 11 randomised controlled trials found that resistance training significantly increased lean body mass, reduced body fat and improved grip strength during chemotherapy.[23] Recent research is starting to also show a beneficial effect of exercise during chemotherapy not only on body composition, but on clinical outcomes such as cardiovascular toxicities from chemotherapy and treatment response.[24, 25] In addition, exercise is one of the most effective evidence-based interventions for cancer-related fatigue (CRF), which is among the most debilitating side effects of treatment affecting 70-100% of people. A network meta-analysis of 47 RCTs found that combined aerobic and resistance exercise was the most effective modality for reducing CRF during chemotherapy.[26] This is in line with 2026 practice guidelines that confirm structured physical activity as one of the non-pharmacological interventions with the strongest evidence base.[27] Thus, clinicians should advise and support patients to remain as active as possible within their individual capacity and, ideally, engage in supervised exercise programmes combining aerobic and resistance components, adapted to tolerance.

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Survivorship

Following completion of curative treatment, diet and exercise remain powerful modifiable factors. Breast cancer survivors face elevated risk of recurrence, cardiovascular disease (partly treatment-related), osteoporosis, and treatment-related impacts on quality of life. A high-quality dietary pattern combined with regular physical activity can simultaneously address all of these.

Exercise & survival

The evidence for physical activity in survivorship is compelling. A systematic review and meta-analysis found that the most physically active breast cancer survivors had a significantly lower risk of all-cause mortality and breast cancer-specific mortality compared to the least active.[28] These benefits appear independent of BMI, oestrogen receptor subtype and genetic risk, suggesting that physical activity exerts broad universal benefits. Combined aerobic and resistance training has been identified as the optimal modality for improving quality of life in breast cancer survivors and promoting longer term adherence, according to a recent network component meta-analysis.[27, 29] Thus, survivors should gradually build up to at least 150–300 minutes of moderate-intensity aerobic exercise per week, combined with two or more sessions of resistance training targeting major muscle groups.[8]

Dietary patterns & survival

Similarly to primary prevention, high-quality dietary patterns rich in fruits, vegetables, wholegrains, legumes, fish and poultry are associated with reduced all-cause mortality and may reduce recurrence risk.[30, 31] On the other hand, Western dietary patterns rich in refined carbohydrates, red and processed meats, and high-fat foods are associated with increased mortality risk.[30]

Weight management & survivorship

Alcohol intake, high BMI and post-diagnosis weight gain in survivors are associated with adverse disease-free survival. Women should be supported to maintain healthy weight or, if needed, gradually reduce their weight to reduce their risk of recurrence and risk of mortality and morbidity. Energy balance, achieved through combined dietary modification and exercise, may be more important than any single dietary component for recurrence prevention.[8] Finally, women should be informed of the link between breast cancer and alcohol and supported to reduce or stop alcohol consumption.[8]

Conclusion

Diet and physical activity play meaningful and evidence-based roles across the entire breast cancer journey. At each phase, priorities differ: prevention focuses on reducing risk through healthy dietary patterns, adequate fibre, regular physical activity and avoidance of alcohol; during treatment, the priority shifts to eating and exercising enough to preserve muscle, combat fatigue and support treatment completion; and in survivorship, the goal is to sustain a high-quality dietary pattern alongside regular exercise to reduce recurrence risk, improve survival, and address the longer-term impacts of cancer and its treatment.

Clinicians and registered dietitians are well positioned to support patients in translating this evidence into practical, sustainable change, accounting for treatment regime and tolerance, comorbidities, and patient preferences. The best lifestyle pattern is one that incorporates the a bove recommendations while remaining achievable long-term and preserving quality of life.

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