EBCC-13 manifesto: Balancing pros and cons for contralateral prophylactic mastectomy


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Some women diagnosed with unilateral breast cancer are at risk for contralateral breast cancer (CBC): incidence 3–6% per 10 years.

Requests for contralateral prophylactic mastectomy (CPM) are increasing.

First cancer removed by breast-conserving therapy or mastectomy

Contralateral healthy breast

Factors influencing CBC risk:

- Genetic/hereditary factors: BRCA1/2 and other germline mutations, family history
- Patient and characteristics of first breast cancer: young age, lobular histology

What should (not) influence the decision for CPM?

- Personalised CBC risk profile, prognosis of first cancer, multidisciplinary clinical team, robust information for patient
- Anxiety, misinformation

Non-systematic review of literature and expert opinion: 9 recommendations

This manifesto of the European Breast Cancer Council discusses the issues and challenges of CPM and provides recommendations to improve oncological, surgical, physical and psychological outcomes for women presenting with unilateral breast cancer.

Patients need personalised information about CPM risk: benefit and a realistic plan.
Recommendations

1. Communicate best available risks in manageable timeframes to prioritise actions; better risk stratification and implementation of risk-assessment tools combining family history, genetic and genomic information, and treatment and prognosis of the first breast cancer are required.

2. Reserve CPM for specific situations; in women not at high risk of CBC, ipsilateral breast-conserving surgery is the recommended option.

3. Encourage patients at low or intermediate risk of CBC to delay decisions on CPM until treatment for the primary cancer is complete, to focus on treating the existing disease first.

4. Provide patients with personalised information about the risk:benefit balance of CPM in manageable timeframes.

5. Ensure patients have an informed understanding of the competing risks for CBC and that there is a realistic plan for the patient.

6. Ensure patients understand the short- and long-term physical effects of CPM.

7. In patients considering CPM, offer psychological and surgical counselling before surgery; anxiety alone is not an indication for CPM.

8. Eliminate inequality between countries in reimbursement strategies; CPM should be reimbursed if it is considered a reasonable option resulting from multidisciplinary tumour board assessment.

9. Treat breast cancer patients at specialist breast units providing the entire patient-centred pathway.
Article type: Review

EBCC-13 manifesto: Balancing pros and cons for contralateral prophylactic mastectomy


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Abstract

After a diagnosis of unilateral breast cancer, increasing numbers of patients are requesting contralateral prophylactic mastectomy (CPM), the surgical removal of the healthy breast after diagnosis of unilateral breast cancer. It is important for the community of breast cancer specialists to provide meaningful guidance to women considering CPM. This manifesto discusses the issues and challenges of CPM and provides recommendations to improve oncological, surgical, physical and psychological outcomes for women presenting with unilateral breast cancer: (1) Communicate best available risks in manageable timeframes to prioritise actions; better risk stratification and implementation of risk-assessment tools combining family history, genetic and genomic information, and treatment and prognosis of the first breast cancer are required; (2) Reserve CPM for specific situations; in women not at high risk of contralateral breast cancer (CBC), ipsilateral breast-conserving surgery is the recommended option; (3) Encourage patients at low or intermediate risk of CBC to delay decisions on CPM until treatment for the primary cancer is complete, to focus on treating the existing disease first; (4) Provide patients with personalised information about the risk:benefit balance of CPM in manageable timeframes; (5) Ensure patients have an informed understanding of the competing risks for CBC and that there is a realistic plan for the patient; (6) Ensure patients understand the short- and long-term physical effects of CPM; (7) In patients considering CPM, offer psychological and surgical counselling before surgery; anxiety alone is not an indication for CPM; (8) Eliminate inequality between countries in reimbursement strategies; CPM should be reimbursed if it is considered a reasonable option resulting from multidisciplinary tumour board assessment; (9)
Treat breast cancer patients at specialist breast units providing the entire patient-centred pathway.

Key words: *BRCA1/2*, contralateral breast cancer, contralateral prophylactic mastectomy, multidisciplinary, psychooncology, recommendations
INTRODUCTION

Contralateral prophylactic mastectomy (CPM), also referred to as contralateral risk-reducing mastectomy, describes the surgical removal of the unaffected breast in women who developed a unilateral primary breast cancer.\textsuperscript{1} One should realise that a CPM generally implies a bilateral mastectomy, since breast conservation of the affected breast and a CPM is illogical. While CPM is a reasonable option for patients with \textit{BRCA1/2} germline mutations or other characteristics associated with a high risk of contralateral breast cancer (CBC),\textsuperscript{2} most available guidelines and position statements discourage CPM in low-to-average-risk women with unilateral early-stage breast cancer.\textsuperscript{3–9} Nevertheless, after a diagnosis of breast cancer, CPM is frequently one of the first questions raised by patients and increasingly women are requesting (and undergoing) CPM.\textsuperscript{10–13} In one clinic in The Netherlands, as many as one in three women wish to discuss CPM, with an estimated 10\%–15\% of patients requesting CPM (E. Rutgers, personal communication), although there are regional and cultural variations across Europe and published estimates are scarce.

The increase in CPM has become particularly apparent following media publicity of high-profile women undergoing this procedure – the so-called ‘Angelina Jolie effect’.\textsuperscript{5,14,15} However, publicity of medical issues through influential advocates can increase anxiety as well as awareness. In many situations, requests for CPM create an uneasy balance for the surgeons between respecting patients’ fears and wishes and the principle of \textit{primum non nocere} (first, do no harm).\textsuperscript{16–18} Counsellors and surgeons uncomfortable with performing CPM report concerns about the use of surgery as a primary prevention tool (a special case of ‘overtreatment’), an unfavourable risk:benefit ratio, and inadequate patient understanding of the anticipated risks and benefits of CPM.\textsuperscript{17} In a US-based survey, two-thirds of women
undergoing CPM reported no major genetic or familial risk factors for CBC.\textsuperscript{19} Furthermore, although use of bilateral mastectomy has increased since the 2000s, most likely attributable to increased awareness of second breast cancer risk, this has had no measurable impact on mortality rates but has led to an increase in side effects.\textsuperscript{20}

In this European Breast Cancer Conference (EBCC) manifesto, we consider broad societal and biomedical misunderstandings regarding CPM, the challenges of discussing pros and cons, explaining risks, providing a realistic picture and responding to patients asking (or not) for CPM, and the ways in which healthcare professionals can balance patient autonomy and respect for patients’ decisions with avoidance of unnecessary or inappropriate surgery.

**CPM PREVALENCE AND DETERMINING FACTORS**

**CPM prevalence**

Numerous reports in the literature describe doubling to tripling of the number of patients in North America with unilateral early-stage breast cancer undergoing CPM (Appendix Table 1), despite the lack of evidence for improved outcomes.\textsuperscript{20–28} The increase in CPM is particularly pronounced in younger white women.\textsuperscript{21,28,29} Affluent non-Hispanic white women, those with private health insurance and/or those with high socioeconomic status tend to seek more aggressive preventive care.\textsuperscript{20}

In Europe, data are scarce and there is less evidence of an increase in CPM.\textsuperscript{30} Studies in Italy and Switzerland detected no increase over time,\textsuperscript{31,32} whereas more recent studies from the UK\textsuperscript{33} and a single centre in Romania\textsuperscript{34} reported increases in CPM, particularly among those at highest cancer risk. In many
European countries, for example in German university centres, CPM is discussed primarily with BRCA1/2 mutation carriers diagnosed with breast cancer, with an overall uptake rate of approximately 20% that seems to be increasing (R. Schmutzler, personal communication based on data from ~7000 BRCA1/2 mutation carriers). Overall, CPM uptake in some European countries is reported to be much lower than in the USA,\textsuperscript{35,36} but anecdotally CPM rates appear to be rising across Europe.

**EUROPA DONNA survey on CPM usage and reasons**

In light of this manifesto and to explore CPM usage and reasons behind the decision to undergo CPM in Europe, EUROPA DONNA distributed a survey to member societies in 47 countries in October and November 2021. Of the 636 women from 30 countries who responded, 79\% came from Italy, Serbia or Slovenia, 87\% were aged between 35 and 65 years and 446 had breast cancer. Among the 405 women who still had one or both breasts after first breast cancer treatment, 46\% had undergone CPM and 15\% were still considering it. In respondents with breast cancer, the most frequently cited reasons for considering CPM were a BRCA1/2 mutation (cited 156 times) and worries about developing breast cancer again (135 times) or dying from breast cancer (44 times). The most frequently cited reasons for not considering CPM were low risk (cited 55 times), fear of operation (45 times) or regret (38 times), and body image (39 times). Less than half of the women (47\%) for whom this was applicable felt that they had sufficient discussion about the potential risks and benefits of CPM and 33\% said they had insufficient discussion (20\% neutral).
RISK OF CBC AND EFFECTS OF CPM ON MORTALITY AND CBC RISK

After a diagnosis of breast cancer, fear of CBC affects many women.\textsuperscript{19,37–39} CPM may be seen as a way of reducing this worry and bringing peace of mind.\textsuperscript{18,19,40–42} Nevertheless, patients should be informed and understand whether CPM provides a meaningful reduction in the risk of death or, at least, of a second primary CBC. In addition, they should be fully informed about the situations in which CPM is endorsed by professionals and about other risk-reduction strategies. The utility of CPM varies considerably according to clinical situation, genetic profile, and tumour biology. Although CPM reduces the risk of CBC, the absolute benefit is low when women are at low risk of developing a second primary cancer\textsuperscript{43} or at very high risk of progression of the first breast cancer.

Risk factors for CBC

Compared with women not carrying \textit{BRCA}1/2 mutations, those with \textit{BRCA}1/2 germline mutations are at 3- to 4-fold increased cumulative risk of CBC.\textsuperscript{44–46} Carriers of \textit{BRCA}1 germline mutations are at higher cumulative risk of CBC than those with \textit{BRCA}2 germline mutations, particularly when first breast cancer occurs at a young age.\textsuperscript{44,45,47–51} In patients with \textit{BRCA}1/2 germline mutations, CPM reduces the risk of CBC by approximately 90\%,\textsuperscript{52,54} may improve breast cancer-specific survival and overall survival (reported hazard ratios ranging from 0.37 to 0.52),\textsuperscript{53–55} and is generally considered a reasonable option.\textsuperscript{3,56} A potential role for contralateral irradiation in \textit{BRCA}1/2 mutation carriers who opt for unilateral surgery rather than CPM was suggested by a comparative two-arm trial.\textsuperscript{57,58} Prophylactic salpingo-oophorectomy appeared to reduce the risk of breast cancer in patients with \textit{BRCA}2 but not \textit{BRCA}1 mutations in a prospective cohort.\textsuperscript{59}
Beyond BRCA1/2 germline mutations, predictors for developing CBC include deleterious germline mutations in TP53, PALB2 and CHEK2, a family history of breast cancer and a high polygenic risk score (PRS). Additional risk factors associated with CBC include high body mass index, parity, certain characteristics of the first breast cancer (larger tumour size, lobular morphology, oestrogen receptor-negative) and prior radiotherapy at a young age, whereas adjuvant chemotherapy, adjuvant endocrine therapy and older age at diagnosis are associated with decreased CBC risk. The protective effects of systemic adjuvant treatment (e.g. taxane chemotherapy, aromatase inhibitors and tamoxifen) on the unaffected as well as the affected breast are well established and should be considered when estimating overall risk of CBC.

**Risk of CBC and value of CPM in the general population**

The risk of CBC in breast cancer survivors without clear germline genetic predisposition (family history and/or gene mutations or a high PRS) is relatively low with an annual incidence of around 0.4% and 5-year cumulative incidence of 1.9%. Annual risk does not appear to vary substantially by age at diagnosis, so the long-term cumulative risk is substantially higher for younger women. Risk is higher in black and Hispanic than non-Hispanic white women but less is known about populations of other ethnicities.

In the general breast cancer population, the risk of distant metastasis and death from the first breast cancer is typically higher than the risk of developing a second primary breast cancer. Moreover, there is no evidence that CPM improves overall survival compared with breast-conserving surgery or unilateral mastectomy on the tumour-bearing side in the general breast cancer
CPM does not reduce the risk of metastatic disease from the first breast cancer (or indeed death), yet often it is challenging for patients to disentangle the risks of ipsilateral recurrence, distant recurrence and CBC. Although this point may be difficult to communicate to patients, it is important, particularly as multidisciplinary teams may decline requests for CPM because of the low risk of CBC versus the relatively high risk of systemic relapse.

**CBC risk prediction**

While these figures give a broad picture of risk factors, they provide less guidance when discussing CPM with an individual patient. Several models for assessing the risk of CBC exist, including the Manchester formula, CBCRisk, PredictCBC, BOADICEA and BRCAPRO. BOADICEA and PredictCBC incorporate the effect of multiple factors including important breast cancer risk genes and PRS (PRS313, including 313 single-nucleotide polymorphisms). However, several have limited clinical value with only moderate discrimination. BRCAPRO and BOADICEA do not consider the risk reduction associated with systemic treatment and relatively little is known about molecular predictors (based on genomic profiling of the first tumour) for CBC. Better tools for CBC prediction are required.

**Recommendation:** Communicate best available risks in manageable timeframes to prioritise actions; better risk stratification and implementation of risk-assessment tools combining family history, genetic and genomic information, and treatment and prognosis of the first breast cancer are required.
Relevance/influence of optimal surgery for first breast cancer on CPM decision

Breast-conserving surgery is considered the standard surgical approach for early-stage breast cancer and has shown survival outcomes at least equivalent to mastectomy. Furthermore, less extensive surgery provides better quality of life and recovery and reduces the risk of complications. In BRCA1/2 mutation carriers, breast-conserving surgery appears to offer non-inferior disease-free, disease-specific and overall survival compared with mastectomy, although the risk of locoregional recurrence is higher with breast-conserving surgery. If mastectomy is not considered the optimal surgical strategy for the diseased breast, it is even more difficult to justify surgical removal of both the diseased and the healthy breast.

Recommendation: Reserve CPM for specific situations; in women not at high risk of CBC, ipsilateral breast-conserving surgery is the recommended option

Non-surgical risk reduction

Alternatives to CPM include primary preventive strategies, such as chemoprophylaxis and/or endocrine therapy, which improve survival, decrease the risk of recurrence and decrease the risk of CBC. Physical exercise and weight control are also effective in reducing the likelihood of a second breast cancer. Strategies aiming to minimise the impact of CBC through detection at an early stage include imaging-based screening (mammography, contrast-enhanced magnetic resonance imaging or, as recently proposed in the perioperative setting by the European Commission Initiative on Breast Cancer, contrast-enhanced mammography), depending on the risk group concerned, and in the future, potentially liquid biopsy-based approaches.
TIMING OF DECISION MAKING, RISK PERCEPTION AND COMPETING RISKS

Generally, over time, the risk of progression of the first tumour declines while the risk of CBC varies, depending on the specific situation. Therefore, the optimal timing of decision making should be taken into account when considering CPM.

Decision making must be based on the best available risk prediction. In the case of a familial predisposition, genetic testing is a prerequisite. If the decision on CPM is to be included in primary therapy planning, patients must receive their genetic results rapidly, but this is often not the case.\textsuperscript{104} Negative BRCA1/2 genetic test results substantially reduce the likelihood of women undergoing CPM.\textsuperscript{104,105} In many countries, a shortage of genetic counsellors is hindering access to genetic testing. It is therefore particularly important that, as the cost of genetic testing decreases, clinicians involved in decision making are literate in genetics and able to communicate genetic test results and provide risk-adjusted clinical recommendations.\textsuperscript{106}

If a patient requests CPM at the time of diagnosis, it is important to allow discussion of the request. However, clinicians should remind patients at the time of diagnosis that the top priority is treatment of the existing diagnosed cancer. Adjuvant systemic therapy has risk-reducing effects and thus there is greater urgency to ensure completion of adjuvant therapy for an existing primary cancer than prophylactic surgery for a cancer that does not exist. Bilateral mastectomy brings a risk of delaying the start of adjuvant therapy, e.g. due to surgical complications.\textsuperscript{107} Treatment delays can negatively affect oncological outcomes.\textsuperscript{43} For women with high-risk breast cancer, for example, those with node-positive disease, it is best to delay a CPM decision at least until after successful adjuvant systemic and
locoregional radiation treatment. In addition, communicating and balancing the risk of invasive CBC and ipsilateral recurrence is important to determine the optimal timing for CPM.

Unless the patient is at high risk, decisions concerning the contralateral breast should be delayed, providing the patient is reassured that such decisions are being postponed (particularly if adjuvant therapy is indicated) rather than ignored. The Manchester guidelines recommend that in most patients, any decision about CPM is deferred until completion of primary cancer treatment if possible, to avoid making a decision when most emotionally vulnerable. A change in decision is not unusual and often women decide not to proceed with CPM.

After CPM, the risk of breast cancer among women with BRCA1/2 germline mutation is <1% in symptomatic carriers and around 0.2% in asymptomatic carriers after a mean cancer-free interval of 3.6 years. To allow patients to make an informed decision about the competing risks of disease progression of the first tumour (e.g. whether to postpone CPM if there is a high risk of recurrence), it is important they have reliable information about the risk of recurrence (e.g. calculated by PREDICT or other appropriate risk programmes) to compare with the risk of CBC within a manageable timeframe. For example, in advanced primary breast cancer, the risk of recurrence may initially be higher than the risk of second breast cancer, but this relationship may be reversed as the recurrence-free period increases. Consequently, it is not only the decision for or against CPM that matters, but also identification of the optimal timing for CPM. Patients (particularly those without a known mutation) lacking reliable information about risk tend to overestimate their likelihood of developing another breast cancer, including CBC, and are more receptive to negative than positive outcomes. Some
women will go to any length to avoid being affected by breast cancer again.\textsuperscript{114} and often patients are unaware that even after CPM, there remains a risk of around 1 in 1000 for developing breast cancer.\textsuperscript{45,115,116} Women who are not carriers of high-risk mutations pay less attention to the potential physical and psychological harms of CPM than the perceived benefits when assessing future cancer risk management strategies.\textsuperscript{117}

Differentiating between competing risks represents an important part of discussions and decision making.\textsuperscript{118} Competing risks, including those from a broader context unrelated to breast cancer, such as age-related comorbidities, provide an important framework for discussions with patients and reimbursement authorities, as well as surveillance considerations. Put simply, the higher the risk of CBC, the more favourable the risk:benefit ratio for CPM. For example, few healthcare professionals would reject a request for CPM from a 37-year-old woman with a germline $BRCA1$ mutation and a T1N0 tumour, whereas most would discourage CPM for a 55-year-old woman with a T2N2 tumour and no germline alterations associated with high risk.

\textbf{Recommendation: Encourage patients at low or intermediate risk of CBC to delay decisions on CPM until treatment for the primary cancer is complete, to focus on treating the existing disease first}

\textbf{Recommendation: Provide patients with personalised information about the risk:benefit balance of CPM in manageable timeframes}

\textbf{Recommendation: Ensure patients have an informed understanding of the competing risks for CBC and that there is a realistic plan for the patient}
IMPACT OF CPM

*Physical impact of surgery*

Although most women are aware of the risks of synthetic implants, including anaplastic large cell lymphoma, squamous cell carcinoma and capsular contracture, few patients are fully aware that bilateral nipple and skin-sparing procedures involve major surgery, and many do not appreciate the risks of surgery and the long recovery period. Compared with unilateral mastectomy, bilateral mastectomy is associated with a higher risk of complications a higher transfusion rate, increased risk of emergency room visits, significantly longer hospital stays, and a higher risk of rehospitalisation or re-operation. Acute or early-onset complications of surgery include tissue/skin flap necrosis, wound dehiscence, infection, haematoma, bleeding, seroma, cellulitis, and more general surgical risks, such as deep vein thrombosis and anaesthetic complications.

In the longer term, chronic effects of surgery include loss of breast sensation, loss of sensitivity of the areola-nipple complex, possible paraesthesia, capsular contracture and pain. Patients should be made aware that breastfeeding and lactation will not be possible. CPM may also necessitate further surgery to address late complications or correct imperfections. A notable proportion of patients require unanticipated re-operation after CPM, most often related to implants. The risk of re-operation is modestly increased with bilateral compared with unilateral mastectomy. Patients should be cognisant of these risks when electing for CPM (implying bilateral mastectomy) as they may underestimate the extent of the procedure and severity of pain. Even among women who felt sufficiently informed
about recovery expectations, many reported underestimating the challenges they would encounter after surgery.\textsuperscript{132}

**Recommendation: Ensure patients understand the short- and long-term physical effects of CPM**

**Psychological impact of CPM**

Numerous studies in North America have explored reasons for women choosing to undergo CPM. There are limited available data from Europe, however, and given the differences in CPM uptake, we cannot necessarily extrapolate these findings. Unfortunately, few registries collect information on reasons for choosing CPM. In a Dutch study of women at high risk of hereditary breast cancer considering CPM, many patients cited reduction in cancer risk and anxiety about cancer returning as the reasons for undergoing CPM.\textsuperscript{133} In our survey, 44\% of women who reported having undergone CPM indicated that worry about developing breast cancer again was at least one of their considerations.

Most studies from North America report that the main factors leading to the decision to undergo CPM are anxiety about recurrence\textsuperscript{134} and a desire to reduce or eliminate CBC risk.\textsuperscript{42,135} Based on the evidence presented above, however, risk reduction may be minimal or even non-existent, except for patients who carry high-risk mutations (and possibly those with a strong family history of breast cancer without known mutations).

While some guidelines state that CPM may be considered to manage extreme anxiety,\textsuperscript{3} surgery may seem a rather extreme treatment option for anxiety. Moreover, worries may not be alleviated by CPM, undermining the rationale for CPM in this
scenario. Interestingly, physicians with low knowledge of the risk of CBC or recurrence were more likely to consider CPM to be indicated in patients with high anxiety about recurrence than physicians with high knowledge of the risks. Reducing fear and anxiety may be considered a valuable endpoint, but studies evaluating the impact of CPM on psychosocial functioning and cancer-related distress provide contradictory results. Several studies suggest that fear of cancer recurrence remains moderate or high for as long as 20 years after CPM, despite being one of the most commonly cited reasons for undergoing CPM. CPM should not be considered as an intervention to address anxiety. A multidisciplinary approach, including psychological assessment and information on the effectiveness (or not) of CPM in terms of risk reduction, may be needed when responding to a request for the procedure. Psychological interventions may be more important than surgery to manage fear of recurrence, providing a less invasive alternative to CPM, and patients should receive surgical and psychological counselling and perhaps the opportunity to speak to patients who have already undergone CPM or who have chosen breast conservation and watchful waiting for the treated and contralateral breast. In addition, people typically show bias to defend previously made irreversible decisions, and therefore it is perhaps more interesting to explore topics that patients wish they had known or would communicate to others going through the same decision-making process.

The decision to undergo CPM is often prompted by a desire to attain breast symmetry, particularly in younger and/or more educated women. In a recent UK survey, 30 (52%) of 58 healthcare professionals agreed that patients should be offered the choice of CPM as a means of achieving symmetry. However, women should be aware of other ways to address asymmetry, such as
breast reduction,\textsuperscript{11} which may preserve sensation and be associated with fewer surgical and wound complications.\textsuperscript{3} In addition, most women newly diagnosed with breast cancer can be treated optimally with breast conservation (including radiation therapy), typically with good cosmetic outcomes. In this clinical situation, a request for CPM would imply a bilateral mastectomy (usually skin- or nipple-sparing with reconstruction). This represents major surgery compared with the relatively minor procedure of local tumour excision with radiotherapy, which is associated with minimal side effects yet identical long-term oncological outcomes. In this setting, breast-conserving surgery (and possible contralateral breast reduction) is the safest and best way to maintain symmetry.

Other explanations for choosing CPM include avoiding the anxiety, psychological burden and constant reminder of previous cancer associated with ongoing surveillance and awaiting breast cancer screening results,\textsuperscript{30,132,142} mistrust of surveillance to detect future cancers,\textsuperscript{5,42,141,143} and avoiding potential future chemotherapy.\textsuperscript{141} Frequent screening, anticipated side effects of treatment, and fear of cancer recurrence, further therapy and death can exacerbate psychological distress.\textsuperscript{75} It is important that physicians are sympathetic to patients’ concerns and fears.\textsuperscript{132} While CPM may alleviate some of these concerns to a greater or lesser extent, cancer distress, poor psychological wellbeing, feelings of reduced quality of life and femininity, body image dissatisfaction and other concerns may persist.\textsuperscript{75,114,124,144,145}

Some women view mastectomy as a way of turning a negative life experience into an opportunity for aesthetic improvement, regaining control over their body or providing psychological and physical freedom.\textsuperscript{16} However, these can be unmet expectations possibly related to the lack of in-depth information about the difference
between breast augmentation only for cosmetic purposes and mastectomy for oncological reasons, a difference that should be highlighted when discussing CPM with the patients. Paradoxically, CPM may alleviate the sense of anguish at loss from the first mastectomy. It has also been suggested that a general fear of cancer recurrence is focused on the contralateral breast because this represents an easily conceptualised, operable target; removal of the contralateral breast can give the woman a sense of taking control and reclaiming peace of mind.\textsuperscript{75}

Personality traits such as neuroticism influence achieved body image and quality of life, illustrating the breadth of factors affecting patient-reported outcomes.\textsuperscript{146} Some women with a good cosmetic result are very unhappy with their surgery, whereas others are content with a relatively poor cosmetic outcome. While most patients undergoing CPM expressed satisfaction with their decision and low regret, satisfaction was lower in women with surgical complications, a poor cosmetic result, a diminished sense of sexuality, diminished body image or lack of information about surveillance.\textsuperscript{39,131,147} A considerable proportion of patients said that surgical outcomes were worse than expected, including worse sense of sexuality or self-consciousness,\textsuperscript{18} or that reconstruction after CPM did not meet their expectations, which may have been unrealistic in relation to sexuality, feeling that breasts were part of their body and risk of surgical complications.\textsuperscript{39} Women also mentioned a desire for greater detail about the actual appearance of reconstructed breasts, the incidence of multiple surgical procedures, the effect of losing all nipple sensation, and surveillance and prophylaxis options.\textsuperscript{139,147} Patients with particular personality traits during discussions about breast reconstruction may benefit from early referral to psychosocial counselling or psychologist-led patient support groups. Presurgical psychological assessment should cover patients’ understanding of the CPM
procedure and cancer risk, the potential physical and emotional impact of surgery, informed decision making, and past/current psychological issues (anxiety and body image). Particular attention to appearance-related concerns may be important in younger, more educated women.

Psychological impact is not limited to patients. Many prejudices exist and sometimes surgeons who are anxious about the risk of CBC may encourage patients to undergo CPM. The surgeon’s advice and attitude are additional important factors influencing patients’ decisions regarding CPM. Surgeons with a mean annual breast surgery case load ≤10 were more likely to perform mastectomy than surgeons with higher case loads.

**Recommendation:** In patients considering CPM, offer psychological and surgical counselling before surgery; anxiety alone is not an indication for CPM

**REIMBURSEMENT**

For women in certain social or economic settings, the question of reimbursement is important when considering CPM. In some healthcare and private insurance systems, the high costs of CPM are not reimbursed even in *BRCA1/2* mutation carriers, whereas in other countries, such as the US, there is sometimes a financial incentive for surgeons to recommend CPM even if not oncologically indicated. In many countries, including Austria, Croatia, Slovenia and Sweden, CPM is reimbursed if the clinician considers the procedure to be supported from a medical perspective. In Germany, an independent second opinion with comprehensive counselling from a specialised centre to secure non-directive and appropriate risk prediction and communication is recommended. It is, therefore, important to mention reimbursement when discussing CPM with the patient. In The Netherlands, particular
risk profiles should trigger a discussion with the patient about CPM, and if this option is selected, it is reimbursed, whereas in Greece, CPM is not reimbursed, even if recommended by the clinician.

**Recommendation:** Eliminate inequality between countries in reimbursement strategies. CPM should be reimbursed if it is considered a reasonable option resulting from multidisciplinary tumour board assessment

**BETTER COMMUNICATION WITH PATIENTS**

Surgeons should be aware of the impact they may have on understanding risk and regret. Surgeons can empower patients to incorporate accurate risk assessment and individual patient preferences in their decision making.\(^{12}\) In a US-based survey, the proportion of patients without high genetic risk or an identified mutation who ultimately underwent CPM was 10-fold lower in those who reported a surgeon recommendation against CPM versus those who received no recommendation for or against.\(^{40}\) Importantly, patients advised against CPM by their surgeon did not report substantially greater dissatisfaction with the surgical decision if there was open discussion.\(^{151}\) The greatest dissatisfaction was reported if surgeons advised against CPM without discussion. According to reports in the literature, in one-third of cases, there is no substantial discussion about CPM between surgeons and their patients.\(^{12,151}\)

Behavioural science suggests that patient decision making can be improved through the language used for careful communication of low-probability events.\(^{113}\) Use of appropriate language is very important when communicating losses and
gains to patients. Decision aids appropriate to patients’ literacy and education levels can help in providing balanced information to support an informed choice. Use of absolute frequencies and diagrams (e.g. infographics, iconography) can help in communicating risk visually and objectively. Decision aids may also reassure patients who have decided to postpone their decision, perhaps because they highlight the limited benefits associated with CPM and safe alternatives. Patients may also refer to such resources at a later date if worries about CBC re-emerge. Information processing may be affected by the stress and emotions of a diagnosis. Women involved in studies of decision aids have emphasised the need for access to these tools to support informed choice and the importance of discussing the potential downsides of CPM alongside benefits. An understanding of the role of emotion in decision making is also critical, and empathic communication may enable surgeons to help patients think about risks in the context of intense emotions.

Recent studies have highlighted differences between various specialties advising patients during their decision making. In particular, plastic surgeons were more likely or comfortable than other surgeons and oncologists to recommend CPM, emphasising the need for oncological awareness among plastic surgeons influencing patient decision making, and the need for active involvement of plastic surgeons in the shared decision-making process. Similarly, in a survey of members of the German Cancer Society, one-third of respondents communicated bilateral mastectomy or CPM as an option for non-BRCA1/2 mutation carriers who were healthy women or had unilateral breast cancer, respectively.

**Recommendation:** Treat breast cancer patients at specialist breast units providing the entire patient-centred pathway
CONCLUSION: SHARED DECISION MAKING

An urgent priority for the medical and surgical community is to overturn misconceptions about potential benefits and harms of CPM for the management of unilateral breast cancer. Supporting patient autonomy may lead to excessive surgery if the patient is misinformed, so it is important that shared decision making involves actively ensuring that patients have accurate knowledge rather than deferring to misinformed wishes. Careful discussion about the risks of recurrence, CBC, mortality, surgical complications and sequelae, and psychological outcomes is critical to ensure patients are empowered to make an informed decision. Importantly, risk estimates should be given in absolute numbers and for manageable periods of time. In this context, it is particularly important to weigh the risk of recurrence of the already diagnosed breast cancer against the risk of new disease. The principle of autonomy should not prevail over ethical principles, and respecting autonomy when a treatment decision is based on risk overestimation is debatable.

Patients should have realistic expectations about CPM. Patients require time to consider and discuss options based on thorough knowledge and understanding of the risks. Even among highly educated women, awareness and understanding of risk leaves much room for improvement, and tools to help communicate risk may be helpful. Investing time in educating patients is essential, given that higher levels of breast cancer knowledge are associated with decreased likelihood of choosing CPM. It may take several consultations to fully inform the patient about potential outcomes, the risks of surgery and the lack of impact on fear of recurrence, and a discussion guide based on that recommended by the
American Society of Breast Surgeons⁴ may be helpful (Table 1). Of note, the Manchester guidelines include a ‘cooling-off period’ as an important step within the shared decision-making process.⁵

**Table 1. CPM discussion guide for patients considering CPM for unilateral breast cancer who are not at high risk of CBC (reproduced from the American Society of Breast Surgeons guideline⁴)**

| CPM is not 100% protective against cancer forming in your other breast |
| CPM will not improve your cure rate for your known cancer |
| CPM will not reduce your risk of cancer returning from your known cancer |
| CPM will not reduce your need for other cancer treatments for your known cancer (adjuvant therapy), if indicated |
| The risk of surgical complications at the surgical site (such as bleeding, infection, healing complications and chronic pain) is approximately twice as high when CPM is performed |
| CPM results in permanent numbness of the chest wall (and nipple if preserved) |
| CPM with reconstruction will result in an increased number of operations |
| Complications from CPM may delay treatment of your known cancer, including chemotherapy and radiation that may be recommended after surgery |
| CPM may be associated with negative impact on physical, emotional and sexual wellbeing. Approximately 10% of women regret their decision to undergo CPM |
| Breast feeding will not be possible after CPM |
| Women who undergo CPM will not need mammograms or routine breast imaging for cancer screening after surgery |

CPM, contralateral prophylactic mastectomy.
By working as a multidisciplinary team involving oncologists, surgeons, clinical geneticists, radiologists, radiation therapy specialists, clinical psychologists, breast care nurses and reconstructive nurses in a specialist breast cancer centre, the steps described above may help to stem the tide of CPM.

**PROS AND CONS SUMMARY**

For certain women with genetic characteristics or family history, CPM offers a meaningful reduction in the risk of CBC and death from breast cancer and the balance of benefit versus risk favours CPM. However, for a large proportion of women, fear, exaggerated perception of risk, lack of awareness of negative outcomes of CPM, and inadequate discussion and counselling are leading women to undergo CPM despite cons outweighing the pros. Multidisciplinary teams are critical in helping women to understand competing risks, explaining pros and cons, and working together to provide best possible oncological, physical and psychological outcomes for women diagnosed with unilateral breast cancer.

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Highlights

- Increasingly, patients diagnosed with unilateral breast cancer request CPM
- Here, a multidisciplinary panel of breast cancer experts provides guidance on CPM
- Patients should be counselled and treated at specialist breast centres
- Patients need to understand competing risks for contralateral breast cancer
- Patients need personalised information about CPM risk:benefit and a realistic plan
Declaration of interests

☐ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☒ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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