

# Early and locally advanced breast cancer: diagnosis and management

NICE guideline

Published: 18 July 2018

Last updated: 14 April 2025

[www.nice.org.uk/guidance/ng101](https://www.nice.org.uk/guidance/ng101)

## Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the [Yellow Card Scheme](#).

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should [assess and reduce the environmental impact of implementing NICE recommendations](#) wherever possible.

# Contents

Overview .....	6
Who is it for? .....	6
Recommendations.....	7
1.1 Providing information and psychological support.....	7
1.2 Pretreatment assessment.....	8
1.3 Assessment of tumour profile and genetic testing .....	9
1.4 Surgery to the breast and axilla.....	10
1.5 Breast reconstruction.....	14
1.6 Systemic anti-cancer therapy planning .....	18
1.7 Systemic anti-cancer therapy for all receptor subtypes .....	19
1.8 Triple negative (ER/PR/HER2-negative) breast cancer.....	22
1.9 HER2-positive breast cancer .....	25
1.10 Hormone receptor positive, HER2-negative breast cancer .....	27
Adjuvant treatment .....	28
1.11 Endocrine therapy for hormone receptor positive breast cancer.....	29
1.12 Adjuvant bisphosphonate therapy .....	41
1.13 Radiotherapy .....	42
1.14 Management of treatment side effects and menopausal symptoms .....	48
1.15 Follow-up .....	56
1.16 Lifestyle.....	57
1.17 Locally advanced inoperable disease .....	58
Terms used in this guideline.....	60
Recommendations for research .....	61
Key recommendations for research .....	61
Other recommendations for research .....	62
Rationale and impact.....	69
Providing information and psychological support.....	69

Predictive factors .....	69
Surgery to the breast.....	70
Further surgery after breast-conserving surgery .....	71
Evaluation and management of a positive axillary lymph node.....	73
Breast reconstruction .....	74
Adjuvant therapy planning .....	75
Adjuvant chemotherapy for invasive breast cancer .....	76
Neoadjuvant treatment of triple-negative breast cancer .....	77
Neoadjuvant treatment of HER2-positive breast cancer .....	78
Biological therapy.....	79
Neoadjuvant chemotherapy.....	80
Neoadjuvant endocrine therapy .....	81
Adjuvant endocrine therapy for ER-positive invasive breast cancer .....	82
Extended endocrine therapy.....	86
Endocrine therapy for ductal carcinoma in situ.....	87
Adjuvant bisphosphonate therapy .....	87
Radiotherapy techniques.....	89
Radiotherapy after breast-conserving surgery.....	90
Radiotherapy after mastectomy .....	91
Dose fractionation of external beam radiotherapy .....	92
Radiotherapy to nodal areas .....	94
Radiotherapy after neoadjuvant chemotherapy .....	95
Lymphoedema: early identification and risk reduction.....	95
Lymphoedema management.....	98
Arm and shoulder mobility .....	101
Lifestyle.....	104
Context.....	106
Groups that are covered.....	107

Groups that are not covered .....	107
Finding more information and committee details.....	108
Update information .....	109

This guideline replaces TA107, TA108, TA109, TA112, ES15 and CG80.

This guideline partially replaces CG81.

This guideline is the basis of QS12.

## Overview

This guideline covers diagnosing and managing early and locally advanced breast cancer. It aims to help healthcare professionals offer the right treatments to people, taking into account the person's individual preferences.

## Who is it for?

- Healthcare professionals
- Commissioners and providers of breast cancer services
- People with early and locally advanced breast cancer, their families and carers

# Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in [NICE's information on making decisions about your care](#).

Using inclusive language in healthcare is important for safety, and to promote equity, respect and effective communication with everyone. This guideline does not use inclusive language in whole or in part because:

- the evidence has not been reviewed, and it is not certain from expert opinion which groups the advice covers **or**
- the evidence has been reviewed, but the information available for some groups was too limited to make specific recommendations **or**
- only a very limited number of recommendations have been updated in direct response to new evidence or to reflect a change in practice.

Healthcare professionals should use their clinical judgement when implementing the recommendations, taking into account the individual's circumstances, needs and preferences, and ensuring all people are treated with dignity and respect throughout their care.

[Making decisions using NICE guidelines](#) explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

## 1.1 Providing information and psychological support

- 1.1.1 Ensure all people with breast cancer have a named clinical nurse specialist, or other specialist key worker with equivalent skills, to support them throughout diagnosis, treatment and follow-up. **[2009, amended 2018]**

- 1.1.2 Offer all people with breast cancer prompt access to specialist psychological support and, where appropriate, psychiatric services. **[2009]**
- 1.1.3 For information about identifying, treating and managing depression in people aged 18 and over who also have a chronic physical health problem such as cancer, see the recommendations in the [NICE guideline on depression in adults with a chronic physical health problem](#). **[2025]**
- 1.1.4 Discuss opportunities for people with breast cancer to be involved in research, and encourage entry into clinical trials and other studies. **[2018]**
- 1.1.5 Discuss the potential preservation of fertility with people with brain tumours where treatment may have an impact on their fertility (see the [recommendations on fertility preservation for medical indications in NICE's guideline on fertility problems](#)). **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on providing information and psychological support](#).

## 1.2 Pretreatment assessment

- 1.2.1 For people having investigations for early and locally advanced invasive breast cancer:
- perform pretreatment ultrasound evaluation of the axilla **and**
  - if abnormal lymph nodes are identified, perform ultrasound-guided needle sampling. **[2009]**
- 1.2.2 Do not routinely use MRI of the breast as part of the preoperative assessment of people with biopsy-proven invasive breast cancer or ductal carcinoma in situ (DCIS). **[2009]**
- 1.2.3 Offer MRI of the breast as part of preoperative assessment to people with invasive breast cancer:

- if the extent of disease is not clear from clinical examination, mammography and ultrasound assessment for planning treatment
- if accurate mammographic assessment is difficult because of breast density
- to assess the tumour size if breast-conserving surgery is being considered for invasive lobular cancer. **[2009]**

## 1.3 Assessment of tumour profile and genetic testing

- 1.3.1 Assess the oestrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) status of all invasive breast cancers simultaneously at the time of initial histopathological diagnosis. **[2018]**
- 1.3.2 Assess the ER status of all invasive breast cancers using standardised and quality-assured immunohistochemical techniques, and report the results quantitatively. **[2009]**
- 1.3.3 Assess the PR status of all invasive breast cancers using standardised and quality-assured immunohistochemical techniques, and report the results quantitatively. **[2018]**
- 1.3.4 Assess the HER2 status of all invasive breast cancers using standardised and quality-assured techniques, and report the results quantitatively. **[2009]**
- 1.3.5 Ensure that the ER, PR and HER2 statuses are available and recorded at the preoperative and postoperative multidisciplinary team meetings when systemic treatment is discussed. **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on predictive factors](#).

Full details of the evidence and the committee's discussion are in [evidence review C: adjuvant systemic therapy planning](#).

## Genetic testing

- 1.3.6 Offer genetic testing for BRCA1 and BRCA2 mutations to women under 50 years with [triple-negative breast cancer](#), including those with no family history of breast or ovarian cancer (also see the [recommendations on genetic testing in the NICE guideline on familial breast cancer](#)). [2017]

## 1.4 Surgery to the breast and axilla

- 1.4.1 Treat all people with ER- positive invasive breast cancer with surgery and appropriate systemic therapy, rather than endocrine therapy alone, unless a significant comorbidity means surgery is not suitable for them. [2009]

### Paget's disease

- 1.4.2 Offer breast-conserving surgery with removal of the nipple–areolar complex as an alternative to mastectomy for people with Paget's disease of the nipple that has been assessed as localised. Offer oncoplastic repair techniques to maximise cosmesis. [2009]

### Further surgery after breast-conserving surgery

- 1.4.3 Offer further surgery (re-excision or mastectomy, as appropriate) after breast-conserving surgery where invasive cancer or DCIS is present at the radial margins ('tumour on ink'; 0 mm). [2018]

For a short explanation of why the committee made the 2018 recommendation and how it might affect practice, see the [rationale and impact section on surgery to the breast](#).

Full details of the evidence and the committee's discussion are in [evidence review A: surgery to the breast](#).

- 1.4.4 Consider further surgery (re-excision or mastectomy, as appropriate) after breast-conserving surgery for DCIS without invasive cancer if tumour cells are present within 2 mm of, but not at, the radial margins (greater than 0 mm and less than 2 mm). As part of the decision making:
- discuss the benefits and risks with the person
  - take into account:
    - the person's circumstances, needs and preferences
    - any comorbidities
    - tumour characteristics and potential treatments, including the use of radiotherapy (also see [radiotherapy after breast-conserving surgery](#)) and other adjuvant therapies. **[2024]**
- 1.4.5 Consider further surgery (re-excision or mastectomy, as appropriate) after breast-conserving surgery for invasive cancer with or without DCIS if tumour cells are present within 1 mm of, but not at, the radial margins (greater than 0 mm and less than 1 mm). As part of the decision making:
- discuss the benefits and risks with the person
  - take into account:
    - the person's circumstances, needs and preferences
    - any comorbidities
    - tumour characteristics and potential treatments, including the use of radiotherapy (also see [radiotherapy after breast-conserving surgery](#)) and other adjuvant therapies. **[2024]**

1.4.6 When discussing the benefits and risks of further surgery, follow the recommendations on:

- [enabling patients to actively participate in their care in NICE's guideline on patient experience in adult NHS services](#) **and**
- [communicating risks, benefits and consequences in NICE's guideline on shared decision making](#). **[2024]**

For a short explanation of why the committee made the 2024 recommendations and how they might affect practice, see the [rationale and impact section on further surgery after breast-conserving surgery](#).

Full details of the evidence and the committee's discussion are in [evidence review N: further surgery after breast-conserving surgery based on tissue margins](#).

## Surgery to the axilla: ductal carcinoma in situ

1.4.7 Do not routinely perform SLNB for women with a preoperative diagnosis of DCIS who are having breast-conserving surgery, unless they are considered to be at high risk of invasive disease. People at high risk of invasive disease include those with a palpable mass or extensive microcalcifications. **[2009]**

1.4.8 Offer SLNB to all people who are having a mastectomy for DCIS. **[2009]**

## Surgery to the axilla: invasive breast cancer

1.4.9 Perform surgery using sentinel lymph node biopsy (SLNB) rather than axillary lymph node clearance to stage the axilla for people with invasive breast cancer if they have:

- no evidence of lymph node involvement on ultrasound **or**
- a negative ultrasound-guided needle biopsy. **[2009, amended 2023]**

1.4.10 Perform SLNB using the dual technique with isotope and blue dye. **[2009]**

## Evaluation and management of a positive axillary lymph node identified by a preoperative ultrasound-guided needle biopsy

- 1.4.11 Offer axillary node clearance to people with invasive breast cancer who have a preoperative ultrasound-guided needle biopsy with pathologically proven lymph node metastases. **[2009, amended 2018]**

## Evaluation and management of a positive axillary lymph node identified by a sentinel lymph node biopsy (in people with a normal preoperative ultrasound-guided needle biopsy)

- 1.4.12 Offer further axillary treatment (axillary node clearance or radiotherapy) after SLNB to people who have 1 or more sentinel lymph node macrometastasis. **[2018]**
- 1.4.13 Discuss the benefits and risks of not having further axillary treatment after primary breast-conserving surgery (within clinical trials where available) with women who:
- have 1 or 2 sentinel lymph node macrometastases **and**
  - have been advised to have whole-breast radiotherapy with systemic therapy (which may be endocrine therapy). **[2018]**
- 1.4.14 Do not offer further axillary treatment to people who only have micrometastases in their sentinel lymph nodes after primary surgery for invasive breast cancer. **[2018]**
- 1.4.15 Do not offer further axillary treatment to people who have isolated tumour cells in their sentinel lymph nodes after primary surgery for invasive breast cancer. Classify this as lymph node-negative breast cancer. **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on evaluation and management of a positive axillary lymph node](#).

Full details of the evidence and the committee's discussion are in [evidence review B: management of the positive axilla](#).

## Audits

- 1.4.16 All breast units should audit their local, regional and distant recurrence rates after treatment, including systematically collecting data on radial margins and demographic information (such as socioeconomic status, age and ethnicity). **[2009, amended 2024]**
- 1.4.17 Breast units should audit their axillary recurrence rates. **[2009]**

## 1.5 Breast reconstruction

- 1.5.1 Offer breast reconstruction to people after they have had mastectomy for breast cancer. **[2023]**
- 1.5.2 Be aware that some people may prefer not to have breast reconstruction surgery. **[2018]**
- 1.5.3 Offer both breast reconstruction options to women (immediate reconstruction and delayed reconstruction), whether or not they are available locally. **[2018]**
- 1.5.4 Offer immediate breast reconstruction to women who have been advised to have a mastectomy, including those who may need radiotherapy, unless they have comorbidities that rule out reconstructive surgery. **[2018, amended 2023]**
- 1.5.5 Discuss the benefits and risks of immediate breast reconstruction and delayed breast reconstruction with women. Topics to discuss include those in table 1 and:
- the timing of breast reconstruction surgery (at the same time as mastectomy

or later)

- different breast reconstruction surgery options and what they involve
- how the timing of breast reconstruction surgery affects the options available
- the uncertainty over long-term outcomes in women having radiotherapy.

[2018]

**Table 1 Breast reconstruction options for women who choose breast reconstruction**

Category	Immediate breast reconstruction	Delayed breast reconstruction
Definition	Reconstruction is started in the same operation as the mastectomy	After a mastectomy, reconstruction is done in a separate operation
Number and timing of operations	<p>More than 1 operation is usually needed to complete the reconstruction</p> <p>The total number of operations will vary. It may be affected by factors such as:</p> <ul style="list-style-type: none"> <li>• type of reconstruction (for example, some are planned in stages; a prosthesis may be worn until reconstruction is complete)</li> <li>• personal preferences (such as whether a nipple reconstruction is requested)</li> </ul> <p>Fewer operations may be needed</p>	<p>More than 1 operation is usually needed to complete the reconstruction</p> <p>The total number of operations will vary. It may be affected by factors such as:</p> <ul style="list-style-type: none"> <li>• type of reconstruction (for example, some are planned in stages; a prosthesis may be worn until reconstruction is complete)</li> <li>• personal preferences (such as whether a nipple reconstruction is requested)</li> </ul> <p>More operations may be needed</p>

Category	Immediate breast reconstruction	Delayed breast reconstruction
Breast reconstruction options available	<p>These will vary depending on personal preferences (such as breast size desired), current body shape, other health conditions, previous operations and lifestyle factors (such as hobbies)</p> <p>Not all hospitals or surgeons can offer all procedures. Travel to a different hospital may be needed for a specific option</p> <p>Options may be available that spare or preserve the breast skin (which may mean less scarring and a more natural look)</p> <p>Limited time to make a decision about options (which may include not having a reconstruction) before surgery</p>	<p>These will vary depending on personal preferences (such as breast size desired), current body shape, other health conditions, previous operations and lifestyle factors (such as hobbies)</p> <p>Not all hospitals or surgeons can offer all procedures. Travel to a different hospital may be needed for a specific option</p> <p>Certain options that spare or preserve the breast skin may not be available</p> <p>More time to make a decision (which may include not having a reconstruction) and to plan reconstruction</p>
Benefits	<p>Breast shape remains, which may help maintain body image and have subsequent psychological benefits</p>	<p>Lifestyle changes (such as losing weight and taking regular exercise) may be possible, which increase the options and lower the risks of reconstruction surgery</p> <p>Procedures (and associated recovery) can be planned around other commitments</p>

Category	Immediate breast reconstruction	Delayed breast reconstruction
Risks	<p>Surgical complications can occur after any breast reconstruction and will vary by type of procedure and personal risk factors</p> <p>May be lower rates of:</p> <ul style="list-style-type: none"> <li>• tissue breakdown</li> <li>• surgery for flap removal if it cannot be used because of a complication (which may lead to delayed reconstruction and flat appearance for a period of time)</li> <li>• procedures to improve symmetry</li> </ul> <p>Complications from the mastectomy or axillary surgery can occur during the recovery period</p>	<p>Surgical complications can occur after any breast reconstruction and will vary by type of procedure and personal risk factors</p> <p>May be lower rates of:</p> <ul style="list-style-type: none"> <li>• mastectomy site complications</li> <li>• flap or implant failure (which may lead to delayed reconstruction and flat appearance for a period of time)</li> <li>• capsular contracture (a scar layer around the implant that may lead to pain if severe)</li> </ul> <p>May need to interrupt hormone therapies (tamoxifen) for further surgery</p>
Satisfaction	No clear differences in satisfaction with completed reconstructions	No clear differences in satisfaction with completed reconstructions
Reconstruction and adjuvant therapy (including radiotherapy and chemotherapy)	<p>Radiotherapy or chemotherapy can be given but may be delayed if there are complications from the mastectomy or reconstruction</p> <p>Immediate reconstructions using implants may be more affected by radiotherapy than immediate flap reconstructions</p> <p>May need adaptations to scans if a tissue expander is used. For example, may not be able to have MRI scans and may need modified radiotherapy planning</p>	<p>Complications can also occur after mastectomy alone, which may delay chemotherapy or radiotherapy</p>

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on breast reconstruction](#).

Full details of the evidence and the committee's discussion are in [evidence review I: postmastectomy radiotherapy](#).

## 1.6 Systemic anti-cancer therapy planning

Licensed indications for chemotherapy vary between different options and different regimens. Not all chemotherapy options are licensed for use in line with the recommendations in this guideline, and so some recommended uses may be off-label. See [NICE's information on prescribing medicines](#) and refer to the summary of product characteristics for individual products.

- 1.6.1 Consider systemic anti-cancer therapy (SACT) for people with invasive breast cancer, and ensure that recommendations are documented at the multidisciplinary team meeting. **[2009, amended 2025]**
- 1.6.2 Base recommendations about systemic anti-cancer therapy on multidisciplinary team assessment of the prognostic and predictive factors, and the possible risks and benefits of the treatment. Make decisions with the person after discussing these factors. **[2009, amended 2025]**
- 1.6.3 When discussing the benefits and risks of systemic anti-cancer therapy follow the recommendations on:
  - [enabling patients to actively participate in their care in NICE's guideline on patient experience in adult NHS services](#) **and**
  - [communicating risks, benefits and consequences in NICE's guideline on shared decision making](#). **[2025]**
- 1.6.4 Use the [PREDICT tool](#) to estimate prognosis and the absolute benefits of adjuvant therapy for women with invasive breast cancer. **[2018]**

1.6.5 When using the PREDICT tool, be aware that:

- it is less accurate for:
  - women under 30 with ER-positive breast cancer
  - women aged 70 and over
  - women with tumours larger than 50 mm
- it has not been validated in men, **and**
- the validation may have under-represented some ethnic groups.

Take into account that the potential limitations in versions of PREDICT after 2.0 may differ from those listed here (also see the [PREDICT tool frequently asked questions](#)). **[2018, amended 2023]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on adjuvant therapy planning](#).

Full details of the evidence and the committee's discussion are in [evidence review C: adjuvant systemic therapy planning](#).

## Tumour profiling tests to guide systemic anti-cancer therapy decisions

The [NICE diagnostics guidance on tumour profiling tests](#) provides evidence-based recommendations on tumour profiling tests to guide adjuvant chemotherapy decisions.

## 1.7 Systemic anti-cancer therapy for all receptor subtypes

### Adjuvant chemotherapy

If planning a course of treatment using a medicine covered by a technology appraisal,

check the relevant technology appraisal and NHS commissioning criteria for any linked chemotherapy treatments. Take into account these may be different to the adjuvant chemotherapy regimen recommended in the following section, and use clinical judgement when choosing which treatments to use.

- 1.7.1 For people with breast cancer where adjuvant chemotherapy is indicated, offer a regimen that contains both a taxane and an anthracycline. **[2018, amended 2023]**
- 1.7.2 Discuss with people the benefits and risks of adding a taxane to anthracycline-containing regimens for adjuvant chemotherapy. Topics to discuss include those in table 2 and:
- the benefits of reduced cardiac toxicity and reduced nausea
  - the risks of additional side effects, including neuropathy, neutropenia and hypersensitivity
  - the different side effects and dosing frequencies of different docetaxel and paclitaxel regimens, and the additional clinic visits that may be needed
  - that absolute benefit is proportional to absolute risk of recurrence. **[2018]**

**Table 2 Benefits and risks of adding a taxane to anthracycline-containing regimens and comparison of different taxane regimens [2018, amended 2023]**

Effect of adding a taxane to an anthracycline-containing regimen	3-weekly docetaxel	Weekly or fortnightly paclitaxel
<p>Effect on survival:</p> <p>The benefit for an individual person will depend on the risk of their cancer returning. For people with low risk of recurrence, the benefits may not outweigh the risks or side effects</p>	<p>Some evidence for improved outcomes, including reducing the risk of breast cancer returning and increasing the chance of surviving</p>	<p>Some evidence for improved outcomes, including reducing the risk of breast cancer returning and increasing the chance of surviving</p>

Effect of adding a taxane to an anthracycline-containing regimen	3-weekly docetaxel	Weekly or fortnightly paclitaxel
Benefits	<p>Smaller doses of anthracyclines can be used, which can reduce the risk of side effects such as nausea and vomiting</p> <p>Smaller cumulative doses of individual medicines may reduce long-term side effects, for example, cardiac toxicity and risk of second malignancies</p>	<p>Smaller doses of anthracyclines can be used, which can reduce the risk of side effects such as nausea and vomiting</p> <p>Smaller cumulative doses of individual medicines may reduce long-term side effects, for example, cardiac toxicity and risk of second malignancies</p>
Side effects	<p>Additional side effects may include joint and muscle pain, nerve damage, higher rates of febrile neutropenia and hypersensitivity reactions</p> <p>Some people have long-term hair loss (alopecia) after treatment with taxanes</p>	<p>Additional side effects may include nerve damage and hypersensitivity reactions, but febrile neutropenia is less likely than with 3-weekly docetaxel</p> <p>Some people have long-term hair loss (alopecia) after treatment with taxanes</p> <p>Weekly paclitaxel is tolerated best, but even fortnightly is better tolerated than 3-weekly docetaxel</p>
Administration	Visits to hospital every 3 weeks	Visits to hospital every week or every 2 weeks
Length of course	9 to 12 weeks (3 to 4 cycles)	8 to 12 weeks

1.7.3 Ensure weekly and fortnightly paclitaxel is available locally, as it is better

tolerated than 3-weekly docetaxel, particularly in people with comorbidities. **[2018, amended 2023]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on adjuvant chemotherapy for invasive breast cancer](#).

Full details of the evidence and the committee's discussion are in [evidence review E: adjuvant chemotherapy](#).

## 1.8 Triple negative (ER/PR/HER2-negative) breast cancer

### Neoadjuvant treatment of triple-negative breast cancer

- 1.8.1 Where neoadjuvant chemotherapy is indicated for people with triple-negative invasive breast cancer, offer a regimen that contains a platinum, a taxane and an anthracycline. Discuss the benefits and risks of this approach (see table 3), taking into account the person's circumstances, needs and preferences. **[2025]**

**Table 3 Benefits and risks of adding a platinum to neoadjuvant chemotherapy for triple-negative invasive breast cancer**

Category	Effect of using a platinum-containing neoadjuvant chemotherapy
Effect on overall survival	<p>Using a platinum-containing neoadjuvant chemotherapy regimen improves overall survival compared to a neoadjuvant chemotherapy regimen without a platinum.</p> <ul style="list-style-type: none"> <li>• With a minimum follow-up of 3 years, when people had non-platinum-containing neoadjuvant chemotherapy then 81 out of 100 survived.</li> <li>• When people had platinum-containing neoadjuvant chemotherapy then 85 out of 100 survived (an additional 4 people).</li> </ul>

Category	Effect of using a platinum-containing neoadjuvant chemotherapy
Effect on disease free survival	<p>Using a platinum-containing neoadjuvant chemotherapy regimen improves disease-free survival compared to a neoadjuvant chemotherapy regimen without a platinum.</p> <ul style="list-style-type: none"> <li>• With a minimum follow-up of 3 years, when people had non-platinum-containing neoadjuvant chemotherapy then 75 out of 100 were disease free.</li> <li>• When people had platinum-containing neoadjuvant chemotherapy then 82 out of 100 were disease free (an additional 7 people).</li> </ul>
Effect on pathological complete response rate (no residual cancer found at surgery)	<p>Using a platinum-containing neoadjuvant chemotherapy regimen improves the chances of a pathological complete response in the breast and lymph nodes in the axilla, compared to a neoadjuvant chemotherapy regime without platinum.</p> <ul style="list-style-type: none"> <li>• When people had non-platinum-containing neoadjuvant chemotherapy then 33 out of 100 had a pathological complete response.</li> <li>• When people had platinum-containing neoadjuvant chemotherapy then 48 out of 100 had a pathological complete response (an additional 15 people).</li> </ul>
Effect on breast conservation rate	<p>No increase in the rate of breast conserving surgery was seen with platinum-based therapy.</p>
Side effects	<p>Using a platinum-containing neoadjuvant chemotherapy may mean that that the risks of having certain side effects are increased, but they may vary in severity and not everyone gets them. Neutropenic sepsis (reported as febrile neutropenia in the studies, see note in additional information), neutropenia, thrombocytopenia, and anaemia are seen more frequently with platinum-based chemotherapy.</p>

Category	Effect of using a platinum-containing neoadjuvant chemotherapy
Additional information	<ul style="list-style-type: none"> <li>• Data comes from trials with 3 to 8 years follow-up.</li> <li>• Data comes from trials with younger people (median age ranged from 45 to 52 years old) with few comorbidities and good performance status.</li> <li>• Data comes from trials that either have predominantly or entirely recruited people with female reproductive organs. The effects on people with male reproductive organs are unclear, but they may also benefit from platinum-based neoadjuvant chemotherapy. The effects on pregnant women are also unclear as no data was identified for this population.</li> <li>• The data recorded in the trials was for febrile neutropenia and no data was identified specifically for neutropenic sepsis. The committee noted the partial overlap of this outcome with that of neutropenic sepsis and agreed that the potential for an increased risk of neutropenic sepsis (as a result of the detected increased risk of febrile neutropenia) was important to highlight as this could have a very severe outcome if left untreated. However, some people with febrile neutropenia will not have sepsis and not everyone with neutropenic sepsis will have a fever. (See the <a href="#">NICE clinical knowledge summary on neutropenic sepsis</a> for more information and see also the <a href="#">NICE guideline on neutropenic sepsis: prevention and management in people with cancer</a>.)</li> </ul>

For a short explanation of why the committee made the 2025 recommendation and how it might affect practice, see the [rationale and impact section on neoadjuvant treatment of triple-negative breast cancer](#).

Full details of the evidence and the committee's discussion are in [evidence review S: platinum based neoadjuvant chemotherapy](#).

## Neoadjuvant and adjuvant treatment of triple negative breast cancer

- 1.8.2 Pembrolizumab is recommended as an option in NICE technology appraisal guidance with chemotherapy for neoadjuvant treatment then continued alone as adjuvant treatment of triple-negative locally advanced breast cancer or early breast cancer at high risk of recurrence. For full details, see the [guidance on pembrolizumab \(TA851, 2022\)](#).

## Adjuvant treatment of BRCA-mutation- positive HER2-negative breast cancer

- 1.8.3 Olaparib, alone or with endocrine therapy, is recommended as an option in NICE technology appraisal guidance for the adjuvant treatment of HER2-negative high-risk early breast cancer that has been treated with neoadjuvant or adjuvant chemotherapy in adults with germline BRCA1 or 2 mutations. For full details, see the [guidance on olaparib \(TA886, 2023\)](#).

See also the [section on adjuvant chemotherapy](#).

For advice on germline genetic testing criteria relating to NICE recommended PARP inhibitor treatment (R444.1) see the [National genomic test directory for rare and inherited disease from the National Genomic Test Directory](#).

## 1.9 HER2-positive breast cancer

### Neoadjuvant treatment of HER2-positive breast cancer

See also the [section on neoadjuvant endocrine therapy](#).

- 1.9.1 For people with HER2-positive invasive breast cancer offer neoadjuvant chemotherapy where indicated and in line with the commissioning criteria for any related technology appraisal guidance. **[2025]**
- 1.9.2 Pertuzumab in combination with trastuzumab is recommended as an option in

NICE technology appraisal guidance for treating HER2-positive breast cancer in adults that is locally advanced, inflammatory, or early-stage with a high risk of recurrence. For full details, see the [guidance on pertuzumab \(TA424, 2016\)](#).

For a short explanation of why the committee made the 2025 recommendation and how it might affect practice, see the [rationale and impact section on neoadjuvant treatment of HER2-positive breast cancer](#).

Full details of the evidence and the committee's discussion are in [evidence review T: neoadjuvant chemotherapy for people with HER2 positive breast cancer](#).

## Adjuvant treatment of HER2-positive breast cancer

See also the [sections on adjuvant endocrine therapy for ER-positive invasive breast cancer](#) and [adjuvant chemotherapy](#).

- 1.9.3 Trastuzumab emtansine is recommended as an option in NICE technology appraisal guidance for adjuvant treatment of HER2-positive early breast cancer if there is residual invasive disease in the breast or lymph nodes after neoadjuvant taxane-based and HER2-targeted therapy. For full details, see the [guidance on trastuzumab emtansine \(TA632, 2020\)](#).
- 1.9.4 Pertuzumab with trastuzumab and chemotherapy is recommended as an option in NICE technology appraisal guidance for adjuvant treatment of HER2-positive early breast cancer only if there is lymph node-positive disease. For full details, see the [guidance on pertuzumab \(TA569, 2019\)](#).
- 1.9.5 Offer adjuvant trastuzumab for people with T1c and above HER2-positive invasive breast cancer. Give this at 3-week intervals for 1 year in combination with surgery, chemotherapy, endocrine therapy and radiotherapy, as appropriate. **[2009, amended 2023]**
- 1.9.6 Consider adjuvant trastuzumab for people with T1a/T1b HER2-positive invasive breast cancer, taking into account any comorbidities, prognostic features, possible toxicity of chemotherapy and the person's preferences. **[2018]**

1.9.7 Use trastuzumab with caution in people with HER2-positive invasive breast cancer if they have any of the following:

- a baseline left ventricular ejection fraction (LVEF) of 55% or less
- a history of, or current, congestive heart failure
- a history of myocardial infarction
- angina pectoris needing medication
- cardiomyopathy
- cardiac arrhythmias needing medical treatment
- clinically significant valvular heart disease
- haemodynamic-effective pericardial effusion
- poorly controlled hypertension. **[2009, amended 2018]**

For a short explanation of why the committee made the 2018 recommendation and how it might affect practice, see the [rationale and impact section on biological therapy](#).

Full details of the evidence and the committee's discussion are in [evidence review F: adjuvant biological therapy](#).

## Extended adjuvant treatment for hormone receptor positive HER2-positive breast cancer

1.9.8 Neratinib is recommended as an option in NICE technology appraisal guidance for the extended adjuvant treatment of hormone receptor-positive, HER2-positive early breast cancer in some people who completed adjuvant trastuzumab-based therapy less than 1 year ago. For full details, see the [guidance on neratinib \(TA612, 2019\)](#).

## 1.10 Hormone receptor positive, HER2-negative

## breast cancer

See also the [section on endocrine therapy for hormone receptor positive breast cancer](#).

### Neoadjuvant treatment of ER-positive breast cancer

See also the [section on neoadjuvant endocrine therapy](#).

- 1.10.1 Consider neoadjuvant chemotherapy, where indicated, for people with ER-positive invasive breast cancer. **[2018, amended 2025]**

### Neoadjuvant treatment of ER-negative PR-positive breast cancer

- 1.10.2 Offer neoadjuvant chemotherapy to people with ER-negative PR-positive invasive breast cancer where indicated. **[2018, amended 2025]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on neoadjuvant chemotherapy](#).

Full details of the evidence and the committee's discussion are in [evidence review J: neoadjuvant treatment of early and locally advanced breast cancer](#).

## Adjuvant treatment

See also the [sections on adjuvant systemic anti-cancer therapy for hormone receptor positive, HER2-negative breast cancer](#) and [adjuvant chemotherapy](#).

### Adjuvant treatment of BRCA-mutation-positive HER2-negative breast cancer

- 1.10.3 Olaparib, alone or with endocrine therapy, is recommended as an option in NICE technology appraisal guidance for the adjuvant treatment of HER2-negative high-risk early breast cancer that has been treated with neoadjuvant or adjuvant

chemotherapy in adults with germline BRCA1 or 2 mutations. For full details, see the [guidance on olaparib \(TA886, 2023\)](#).

For advice on germline genetic testing criteria relating to NICE recommended PARP inhibitor treatment (R444.1), see the [National genomic test directory for rare and inherited disease from the National Genomic Test Directory](#).

## 1.11 Endocrine therapy for hormone receptor positive breast cancer

### Neoadjuvant endocrine therapy

- 1.11.1 Consider neoadjuvant endocrine therapy for postmenopausal women with ER-positive invasive breast cancer as an option to reduce tumour size if there is no definite indication for chemotherapy. **[2018]**
- 1.11.2 Advise premenopausal women that neoadjuvant chemotherapy may be more likely to produce a clinical response than neoadjuvant endocrine therapy, but that some tumours do respond to neoadjuvant endocrine therapy. **[2018]**
- 1.11.3 Discuss with women the benefits and risks of neoadjuvant endocrine therapy compared with neoadjuvant chemotherapy (see table 4). **[2018]**

**Table 4 Benefits and risks of neoadjuvant endocrine therapy compared with neoadjuvant chemotherapy for women with ER-positive/HER2-negative breast cancer**

Category	Neoadjuvant endocrine therapy	Neoadjuvant chemotherapy
Definition	Tamoxifen or an aromatase inhibitor started before surgery Only an option for women with ER-positive breast cancer	Chemotherapy given before surgery Only an option for people who would be recommended adjuvant (after surgery) chemotherapy
Administration	Tablet taken once a day at home	Intravenous administration in hospital, as an outpatient

Category	Neoadjuvant endocrine therapy	Neoadjuvant chemotherapy
Effectiveness	<p>For postmenopausal women: may be as effective as neoadjuvant chemotherapy in terms of breast conservation rates and shrinking the tumour</p> <p>For premenopausal women: less effective than neoadjuvant chemotherapy at shrinking the tumour (but some tumours may respond so may be effective in some women)</p>	<p>For postmenopausal women: effective at improving breast conservation rates and shrinking the tumour</p> <p>For premenopausal women: more effective than endocrine therapy at shrinking the tumour</p>
Potential disadvantages	<p>If neoadjuvant endocrine therapy is not effective, then women may proceed to surgery earlier or may still need to have chemotherapy, either before or after surgery</p>	<p>–</p>

Category	Neoadjuvant endocrine therapy	Neoadjuvant chemotherapy
Side effects	<p>All endocrine therapies: menopausal symptoms such as hot flushes</p> <p>For tamoxifen: increased risk of thrombosis and endometrial cancer</p> <p>For aromatase inhibitors: joint and muscle pain, urogenital symptoms, bone density loss (may also occur with tamoxifen in premenopausal women)</p> <p>Side effects are usually reversible</p> <p>May allow women to avoid the additional side effects of chemotherapy (although women may still need adjuvant chemotherapy after surgery)</p>	<p>Side effects may include nausea and vomiting, risk of infections that may be life threatening, fatigue, neuropathy, cardiac toxicity, diarrhoea, constipation, sore mouth, skin and nail changes, risk of blood clots, risk of second malignancies, fluid retention, allergic reactions and hair loss (alopecia)</p> <p>Side effects may persist long term</p>
Fertility and family planning	<p>Women should not become pregnant while taking tamoxifen, or within 2 months of stopping, because it may have adverse effects on the baby</p>	<p>Often causes temporary infertility</p> <p>May cause permanent infertility</p>
Length of course	<p>May take longer than chemotherapy to shrink the tumour enough for breast-conserving surgery</p>	<p>The duration of neoadjuvant chemotherapy is shorter than neoadjuvant endocrine therapy</p>

For a short explanation of why the committee made the 2018 recommendation and how it might affect practice, see the [rationale and impact section on neoadjuvant endocrine therapy](#).

Full details of the evidence and the committee's discussion are in [evidence review J: neoadjuvant treatment of early and locally advanced breast cancer](#).

## Adjuvant systemic anti-cancer therapy for hormone receptor positive, HER2-negative breast cancer

- 1.11.4 Abemaciclib with endocrine therapy is recommended as an option in NICE technology appraisal guidance for adjuvant treatment of hormone receptor-positive, HER2-negative, node-positive early breast cancer at high risk of recurrence. For full details, see the [guidance on abemaciclib \(TA810, 2022\)](#).

## Adjuvant endocrine therapy for ER-positive invasive breast cancer

- 1.11.5 Offer adjuvant endocrine therapy to people with ER-positive invasive breast cancer. **[2025]**

For a short explanation of why the committee made the 2025 recommendations and how they might affect practice, see the [rationale and impact section on adjuvant endocrine therapy for ER positive invasive breast cancer](#).

## People with female reproductive organs

The following recommendations apply to women, and to trans men and non-binary people, who currently have ovaries.

- 1.11.6 Make a shared decision with premenopausal or perimenopausal people with ER-positive invasive breast cancer about the type of endocrine therapy that would

be suitable for them. As part of this process:

- discuss the benefits and risks of using tamoxifen alone, or ovarian function suppression in combination with tamoxifen, or ovarian function suppression in combination with an aromatase inhibitor (see table 5)
- explain that the use of ovarian function suppression (in combination with tamoxifen or an aromatase inhibitor) may be most beneficial for people who are at higher risk of disease recurrence
- provide information about the potential side effects of each treatment option, including what to expect and how these could be managed if they develop (including possible referral to support services).

See also the [recommendations on bone health](#) and [menopausal symptoms](#).  
[2025]

**Table 5 The benefits and risks of using endocrine therapy in combination with ovarian function suppression (OFS)**

Category	Effect of using OFS in combination with tamoxifen compared to tamoxifen alone	Effect of using OFS in combination with aromatase inhibitor treatment (AIT) compared to tamoxifen alone	Effect of using OFS in combination with AIT compared to OFS in combination with tamoxifen
Effect on overall survival	Using OFS in combination with tamoxifen improves overall survival compared to tamoxifen alone.	It was not possible from the evidence to differentiate between OFS in combination with AIT compared to tamoxifen alone for overall survival.	It was not possible from the evidence (from 4 trials pooled) to differentiate for overall survival.

Category	Effect of using OFS in combination with tamoxifen compared to tamoxifen alone	Effect of using OFS in combination with aromatase inhibitor treatment (AIT) compared to tamoxifen alone	Effect of using OFS in combination with AIT compared to OFS in combination with tamoxifen
Effect on disease-free survival	Using OFS in combination with tamoxifen improves disease-free survival compared to tamoxifen alone.	Using OFS in combination with AIT improves disease-free survival compared to tamoxifen alone.	It was not possible from the evidence (from 4 trials pooled) to differentiate for disease-free survival. However, the combined evidence reported in the SOFT and TEXT trials showed that OFS in combination with AIT improves disease-free survival compared to OFS in combination with tamoxifen.

Category	Effect of using OFS in combination with tamoxifen compared to tamoxifen alone	Effect of using OFS in combination with aromatase inhibitor treatment (AIT) compared to tamoxifen alone	Effect of using OFS in combination with AIT compared to OFS in combination with tamoxifen
Side effects	<p>Using OFS in combination with tamoxifen compared to tamoxifen may mean that the risk of having certain side effects are increased. These may include vaginal dryness, hot flushes, sleep disturbances or insomnia, depression symptoms, decreased libido or dyspareunia and osteoporosis. But they may vary in severity, and not everyone gets these.</p> <p>Side effects could be made worse by having combination treatments</p>	<p>Using OFS in combination with AIT compared to tamoxifen may mean that the risk of having certain side effects are increased. These may include vaginal dryness, hot flushes, insomnia, depression symptoms, dyspareunia, fractures and osteoporosis. But they may vary in severity, and not everyone gets these.</p> <p>Side effects could be made worse by having combination treatments</p>	<p>Using either OFS in combination with AIT or OFS in combination with tamoxifen may mean that the risk of having certain side effects are increased compared to having tamoxifen alone. (See the relevant column for potential side effects.) But they may vary in severity, and not everyone gets these.</p> <p>The risk of having some side effects may be higher with one combination treatment than the other, but there is some uncertainty about this because the analysis was not designed to look at this definitively.</p>

For a short explanation of why the committee made the 2025 recommendations and how they might affect practice, see the [rationale and impact section on adjuvant endocrine therapy for ER positive invasive breast cancer: people with female reproductive organs](#).

Full details of the evidence and the committee's discussion are in [evidence review Q: ovarian function suppression](#).

## Adjuvant endocrine therapy for ER-positive invasive breast cancer after menopause

- 1.11.7 Offer an aromatase inhibitor as the initial adjuvant endocrine therapy for women and people who are postmenopausal with ER-positive invasive breast cancer who are at medium or high risk of disease recurrence. Offer tamoxifen to women and people who are at low risk of disease recurrence, or if aromatase inhibitors are not tolerated or are contraindicated. **[2009, amended 2018]**

## People with male reproductive organs

The following recommendations apply to men, and to trans women and non-binary people, who currently have testes.

- 1.11.8 Offer tamoxifen as adjuvant endocrine therapy for people with ER-positive invasive breast cancer who have male reproductive organs. **[2009, amended 2025]**
- 1.11.9 Consider testicular function suppression in combination with an aromatase inhibitor if tamoxifen is not suitable or not tolerated for people with ER-positive invasive breast cancer who have male reproductive organs. **[2025]**

In March 2025, this was an off-label use for testicular function suppression and aromatase inhibitors. See [NICE's information on prescribing medicines](#).

- 1.11.10 Do not use an aromatase inhibitor alone in people with ER-positive invasive breast cancer who have male reproductive organs. **[2025]**
- 1.11.11 Discuss the benefits and risks of the possible treatment options with people with ER-positive invasive breast cancer who have male reproductive organs. Ensure the discussion covers information about potential side effects of endocrine therapy, including side effects specific to people with male reproductive organs such as erectile dysfunction and gynaecomastia (with testicular function suppression in combination with an aromatase inhibitor) and how support could be accessed if they develop these symptoms. **[2025]**

- 1.11.12 On starting testicular function suppression in combination with an aromatase inhibitor, assess bone mineral density in people with ER-positive invasive breast cancer who have male reproductive organs (also see the [recommendations in the section on bone health](#)). **[2025]**

For a short explanation of why the committee made the 2025 recommendations and how they might affect practice, see the [rationale and impact section on adjuvant endocrine therapy for ER positive invasive breast cancer: people with male reproductive organs](#).

Full details of the evidence and the committee's discussion are in [evidence review R: testicular function suppression](#).

## Extended adjuvant endocrine therapy for ER positive invasive breast cancer

- 1.11.13 Discuss the benefits and risks of extended endocrine therapy (past the 5-year point) with people who this treatment may be suitable for (see table 6). **[2018, amended 2023]**
- 1.11.14 Offer extended endocrine therapy with an aromatase inhibitor for women and people who are postmenopausal with ER-positive invasive breast cancer who are at medium or high risk of disease recurrence and who have been taking tamoxifen for 2 to 5 years. Medium or high risk may include people who have lymph node-positive breast cancer, with tumours that are T2 or greater and higher grade. **[2018]**
- 1.11.15 Consider extended endocrine therapy (past the 5-year point) with an aromatase inhibitor for women and people who are postmenopausal with ER-positive invasive breast cancer who are at low risk of disease recurrence and who have been taking tamoxifen for 2 to 5 years. Low risk may include people with lymph node-negative breast cancer, with smaller or lower-grade tumours. **[2018]**

In March 2025, this was an off-label use for aromatase inhibitors. See [NICE's information on prescribing medicines](#).

- 1.11.16 Consider extending the duration of tamoxifen therapy for longer than 5 years for people with ER-positive invasive breast cancer. **[2018]**

**Table 6 Effects of extended endocrine therapy**

Category	Extended tamoxifen therapy (after an initial 5 years of tamoxifen therapy)	Extended endocrine therapy with an aromatase inhibitor (after 5 years of tamoxifen therapy)
Definition	Continuing to take tamoxifen after 5 years of tamoxifen therapy	Switching to an aromatase inhibitor after 5 years of tamoxifen therapy
Who can take this therapy	People with ER-positive invasive breast cancer	Postmenopausal women with ER-positive invasive breast cancer
Effect on breast cancer recurrence: The benefit for an individual person will depend on the risk of their cancer returning. For people with a low risk of recurrence, the benefits may not outweigh the risks or side effects Medium or high risk may include people who have lymph node-positive breast cancer, with tumours that are T2 or greater and higher grade. Low risk may include people with lymph node-negative breast cancer, with smaller or lower-grade tumours	Evidence shows lower rates of breast cancer recurrence compared with 5 years of tamoxifen therapy in women	Lower rates of breast cancer recurrence compared with 5 years of tamoxifen therapy In postmenopausal women, switching to an aromatase inhibitor may be more effective at reducing recurrence than continuing with tamoxifen

Category	Extended tamoxifen therapy (after an initial 5 years of tamoxifen therapy)	Extended endocrine therapy with an aromatase inhibitor (after 5 years of tamoxifen therapy)
<p>Side effects:</p> <p>These are common side effects experienced during additional years taking endocrine therapy. Most effects are reversible when tablets are stopped</p>	<p>Side effects of endocrine therapy will continue for additional years (for example, menopausal symptoms such as hot flushes)</p> <p>Side effects may differ in men</p> <p>With extended use of tamoxifen: increased risk of thrombosis and endometrial cancer, and possibly bone density loss in premenopausal women</p>	<p>Side effects of endocrine therapy will continue for additional years (for example, menopausal symptoms such as hot flushes)</p> <p>With extended use of aromatase inhibitors: bone density loss, and joint and muscle pain</p>
<p>Fertility and family planning</p>	<p>For women, effects on fertility and family planning will continue for additional years as they should not become pregnant while taking tamoxifen, or within 2 months of stopping, because it may have adverse effects on the baby</p>	<p>Not applicable as postmenopausal women only</p>

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on extended endocrine therapy](#).

Full details of the evidence and the committee's discussion are in [evidence review D: endocrine therapy for invasive disease](#).

## Adjuvant endocrine therapy for ER-positive ductal carcinoma in

## situ

- 1.11.17 Discuss the benefits and risks (see table 7) of endocrine therapy after breast-conserving surgery for women with ER-positive DCIS. **[2018]**
- 1.11.18 Offer endocrine therapy after breast-conserving surgery for women with ER-positive DCIS if radiotherapy is recommended but not received. **[2018]**
- 1.11.19 Consider endocrine therapy after breast-conserving surgery for women with ER-positive DCIS if radiotherapy is not recommended. **[2018]**

**Table 7 Effects of endocrine therapy after breast-conserving surgery for women with ER-positive DCIS**

Category	Endocrine therapy after breast-conserving surgery for women with ER-positive DCIS
Definition	Tamoxifen or an aromatase inhibitor for 5 years, taken as a once-daily tablet
Effect on survival and disease recurrence: The benefit for an individual person will depend on the risk of their cancer returning. For people with low risk of recurrence, the benefits may not outweigh the risks or side effects Risk can be estimated using a range of standardised tools and clinical expertise	No effect on survival at 5 or 10 years after diagnosis Lower rate of recurrence of DCIS and lower rate of invasive breast cancer, compared with women who did not receive endocrine therapy or radiotherapy after surgery
Side effects	All endocrine therapies: menopausal symptoms, such as hot flushes For tamoxifen: increased risk of thrombosis, endometrial cancer and possibly bone density loss in premenopausal women For aromatase inhibitors: joint and muscle pain, urogenital symptoms and bone density loss

Category	Endocrine therapy after breast-conserving surgery for women with ER-positive DCIS
Fertility and family planning	Effects on fertility and family planning as women should not become pregnant while taking tamoxifen, or within 2 months of stopping, because it may have adverse effects on the baby

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on endocrine therapy for DCIS](#).

Full details of the evidence and the committee's discussion are in [evidence review D: endocrine therapy for invasive disease](#).

## 1.12 Adjuvant bisphosphonate therapy

In March 2025, the use of bisphosphonates (zoledronic acid or sodium clodronate) in recommendations 1.12.1 and 1.12.2 was off-label. See [NICE's information on prescribing medicines](#).

- 1.12.1 Offer bisphosphonates (zoledronic acid or sodium clodronate) as adjuvant therapy to postmenopausal women with node-positive invasive breast cancer. **[2018]**
- 1.12.2 Consider bisphosphonates (zoledronic acid or sodium clodronate) as adjuvant therapy for postmenopausal women with node-negative invasive breast cancer and a high risk of recurrence. **[2018]**
- 1.12.3 Discuss the benefits and risks of bisphosphonate treatment with women, particularly the risk of osteonecrosis of the jaw, atypical femoral fractures and osteonecrosis of the external auditory canal. Follow the [Medicines and Healthcare products Regulatory Agency/Commission on Human Medicines \(MHRA/CHM\) advice on bisphosphonates](#). **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on adjuvant bisphosphonate therapy](#).

Full details of the evidence and the committee's discussion are in [evidence review G: adjuvant bisphosphonates](#).

## 1.13 Radiotherapy

- 1.13.1 Use a radiotherapy technique that minimises the dose to the lung and heart. **[2018]**
- 1.13.2 Use a deep inspiratory breath-hold radiotherapy technique for people with left-sided breast cancer to reduce the dose to the heart. **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on radiotherapy techniques](#).

Full details of the evidence and the committee's discussion are in [evidence review H: breast radiotherapy](#).

### Radiotherapy after breast-conserving surgery

- 1.13.3 Offer whole-breast radiotherapy to women with invasive breast cancer who have had breast-conserving surgery with clear margins. **[2018]**
- 1.13.4 Consider partial-breast radiotherapy as an alternative to whole-breast radiotherapy for women who have had breast-conserving surgery for invasive cancer (excluding lobular type) with clear margins and who:
- have a low absolute risk of local recurrence (defined as women aged 50 and over with tumours that are 3 cm or less, N0, ER-positive, HER2-negative and grade 1 to 2), **and**

- have been advised to have adjuvant endocrine therapy for a minimum of 5 years. **[2018]**
- 1.13.5 If partial-breast radiotherapy (see recommendation 1.13.4) may be suitable for a woman, discuss the benefits and risks with them and reach a shared decision on its use. Topics to cover include that:
- local recurrence with partial-breast radiotherapy at 5 years is equivalent to that with whole-breast radiotherapy
  - the risk of local recurrence beyond 5 years is not yet known
  - there is a potential reduction in late adverse effects. **[2018, amended 2023]**
- 1.13.6 When giving partial-breast radiotherapy, use external beam radiotherapy. **[2018]**
- 1.13.7 Consider not using radiotherapy for women who:
- have had breast-conserving surgery for invasive breast cancer with clear margins **and**
  - have a very low absolute risk of local recurrence (defined as women aged 65 and over with tumours that are T1N0, ER-positive, HER2-negative and grade 1 to 2) **and**
  - are willing to take adjuvant endocrine therapy for a minimum of 5 years. **[2018]**
- 1.13.8 When considering not using radiotherapy (see recommendation 1.13.7), discuss the benefits and risks with the woman (see table 8) and explain that:
- without radiotherapy, local recurrence occurs in about 50 women per 1,000 at 5 years, and with radiotherapy, occurs in about 10 women per 1,000 at 5 years
  - overall survival at 10 years is the same with or without radiotherapy
  - there is no increase in serious late effects if radiotherapy is given (for example, congestive cardiac failure, myocardial infarction or secondary cancer). **[2018]**

**Table 8 Benefits and risks of radiotherapy compared with no radiotherapy in the low-risk group described in recommendation 1.13.7**

Category	Radiotherapy	No radiotherapy
Effect on local recurrence	On average, in 1,000 women, over 5 years local recurrence occurs in about 10 women, and does not occur in about 990 women	On average, in 1,000 women, over 5 years local recurrence occurs in about 50 women, and does not occur in about 950 women
Effect on survival	No difference in overall survival at 10 years	No difference in overall survival at 10 years
Risks	Possibility of short- and long-term adverse effects on the breast, and resulting cosmetic changes (such as skin soreness, changes to colour of skin, radiation fibrosis or stiffening of the breast tissue)	No short- or long-term adverse effects on the breast, or cosmetic changes
Side effects	In this group of women at low risk, there is no increase in serious late side effects of radiotherapy (such as congestive cardiac failure, myocardial infarction or secondary cancer)	No side effects of radiotherapy will occur
Administration	Given at the treatment centre 5 days a week for 3 weeks after surgery	No need to attend the treatment centre for radiotherapy sessions

1.13.9 Consider adjuvant radiotherapy for women with DCIS following breast-conserving surgery with clear margins. Discuss the possible benefits and risks of radiotherapy (also see the [section on surgery to the breast](#)) and make a shared decision about its use. **[2009]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on radiotherapy after breast-conserving surgery](#).

Full details of the evidence and the committee's discussion are in [evidence review H: breast radiotherapy](#).

## Radiotherapy after mastectomy

- 1.13.10 Offer adjuvant postmastectomy radiotherapy to people with node-positive (macrometastases) invasive breast cancer or involved resection margins. **[2018]**
- 1.13.11 Consider adjuvant postmastectomy radiotherapy for people with node-negative T3 or T4 invasive breast cancer. **[2018]**
- 1.13.12 Do not offer radiotherapy following mastectomy to people with invasive breast cancer who are at low risk of local recurrence (for example, most people who have lymph node-negative breast cancer). **[2018, amended 2023]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on radiotherapy after mastectomy](#).

Full details of the evidence and the committee's discussion are in [evidence review I: postmastectomy radiotherapy](#).

## Dose fractionation for external beam radiotherapy

- 1.13.13 Offer 26 Gy in 5 fractions over 1 week for people with invasive breast cancer having partial-breast, whole-breast or chest-wall radiotherapy, without regional lymph node irradiation, after breast-conserving surgery or mastectomy. **[2023]**
- 1.13.14 Consider 40 Gy in 15 fractions over 3 weeks for people with invasive breast cancer having partial-breast, whole-breast or chest-wall radiotherapy, without regional lymph node irradiation, after breast-conserving surgery or mastectomy when they:
- have a diagnosis that increases sensitivity to radiotherapy **or**
  - have had implant-based reconstruction **or**
  - have any other factor that could mean having radiotherapy over 3 weeks is more acceptable (such as high body mass index [BMI] or fibromyalgia). **[2023]**

- 1.13.15 When discussing the benefits and risks of the 2 regimens, follow the recommendations on:
- [enabling patients to actively participate in their care in the NICE guideline on patient experience in adult NHS services](#) **and**
  - [communicating risks, benefits and consequences in the NICE guideline on shared decision making](#). **[2023]**
- 1.13.16 Offer 40 Gy in 15 fractions over 3 weeks for people with invasive breast cancer having regional lymph node irradiation, with or without whole-breast or chest-wall radiotherapy, after breast-conserving treatment or mastectomy. **[2023]**

For a short explanation of why the committee made the 2023 recommendations and how they might affect practice, see the [rationale and impact section on dose fractionation of external beam radiotherapy](#).

Full details of the evidence and the committee's discussion are in [evidence review M: effectiveness of different external beam hypofractionation radiotherapy regimens in people with early-stage or locally advanced invasive breast cancer](#).

## Breast boost following breast-conserving surgery

- 1.13.17 Offer an external beam boost to the tumour bed for women with invasive breast cancer and a high risk of local recurrence, following whole-breast radiotherapy. **[2009, amended 2018]**
- 1.13.18 Inform women of the risk of side effects associated with an external beam boost to the tumour bed following whole-breast radiotherapy. **[2009, amended 2018]**

## Radiotherapy to nodal areas

- 1.13.19 Do not offer adjuvant radiotherapy to regional lymph nodes to people with invasive breast cancer who have histologically lymph node-negative breast cancer. **[2009, amended 2018]**

- 1.13.20 Do not offer people with invasive breast cancer adjuvant radiotherapy to the axilla after axillary clearance. **[2009, amended 2023]**
- 1.13.21 Offer adjuvant radiotherapy to the supraclavicular fossa to people with invasive breast cancer and 4 or more involved axillary lymph nodes. **[2009]**
- 1.13.22 Offer adjuvant radiotherapy to the supraclavicular fossa to people with invasive breast cancer and 1 to 3 positive lymph nodes if they have other poor prognostic factors (for example, T3 and/or histological grade 3 tumours) and good performance status. **[2009]**
- 1.13.23 Consider including the internal mammary chain within the nodal radiotherapy target for people with node-positive (macrometastases) invasive breast cancer. **[2018]**

For a short explanation of why the committee made the 2018 recommendation and how it might affect practice, see the [rationale and impact section on radiotherapy to nodal areas](#).

Full details of the evidence and the committee's discussion are in [evidence review H: breast radiotherapy](#).

## Intraoperative radiotherapy

- 1.13.24 The Intrabeam radiotherapy system for adjuvant treatment of early invasive breast cancer during breast-conserving surgical tumour removal is not recommended in NICE technology appraisal guidance for routine commissioning. Use is recommended only using machines that are already available, and in conjunction with NHS England specified clinical governance, data collection and submission arrangements. For full details, see the [guidance on the Intrabeam radiotherapy system \(TA501, 2018\)](#). **[2018]**

## Radiotherapy after neoadjuvant chemotherapy

- 1.13.25 Offer local treatment with mastectomy (or, in exceptional cases, breast-conserving surgery) followed by radiotherapy to people with locally advanced or inflammatory breast cancer that has been treated with neoadjuvant chemotherapy. **[2009]**
- 1.13.26 Offer postmastectomy radiotherapy after neoadjuvant chemotherapy if post-treatment histology shows node-positive (macrometastases) breast cancer or involved resection margins. **[2018]**
- 1.13.27 Offer postmastectomy radiotherapy after neoadjuvant chemotherapy if pretreatment investigations show node-positive (macrometastases) breast cancer. **[2018]**
- 1.13.28 Consider postmastectomy radiotherapy after neoadjuvant chemotherapy if post-treatment histology shows node-negative T3 breast cancer. **[2018]**
- 1.13.29 Consider postmastectomy radiotherapy after neoadjuvant chemotherapy if pretreatment investigations show node-negative T3 breast cancer. **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on radiotherapy after neoadjuvant chemotherapy](#).

Full details of the evidence and the committee's discussion are in [evidence review J: neoadjuvant treatment of early and locally advanced breast cancer](#).

## 1.14 Management of treatment side effects and menopausal symptoms

### Lymphoedema: early identification and risk reduction

- 1.14.1 Inform people having breast cancer treatment about their risk of developing lymphoedema after treatment. Before treatment starts, give them information in a

suitable format to take away and refer to. This should include:

- information on:
  - risk reduction strategies, such as maintaining a healthy body weight, ways to reduce their risk of infection, and advice on skincare (for example, use of moisturiser and sunscreen) and physical activity
  - early signs and symptoms, such as signs or sensations of swelling, or signs of infection
  - awareness of skin changes, such as changes in skin colour and appearance of rashes
  - how to self-monitor and identify these signs and symptoms
  - how to collect baseline measurements of the limb.
- that there is no consistent evidence of increased risk of lymphoedema associated with air travel, travel to hot countries, manicures, hot tub use or sports injuries
- that there is no consistent evidence of increased risk of lymphoedema associated with medical procedures (for example, blood tests, injections, intravenous medicines and blood pressure measurement) on the treated side
- who to contact if signs or symptoms develop (see the [section on follow-up](#)).  
**[2018, amended 2025]**

1.14.2 Make a shared decision on whether to perform medical procedures using the arm on the treated side. Base this on the person's preferences and clinical judgement, taking into account the person's clinical needs and the possibility of alternatives.  
**[2018, amended 2025]**

1.14.3 Ensure people who are at risk of, breast-cancer-related lymphoedema are aware that

- physical activity may improve their overall quality of life, and
- there is no indication that physical activity causes, or worsens, lymphoedema.

For advice on a healthy lifestyle, see the [section on lifestyle](#). **[2025]**

- 1.14.4 Do not offer compression therapy as a risk-reducing measure to people who are at risk of breast-cancer-related lymphoedema. **[2025]**

## Surgery for risk-reduction

- 1.14.5 For advice on the use of lymphovenous anastomosis during surgery with special arrangements for clinical governance, consent and audit or research, see the [NICE interventional procedures guidance on lymphovenous anastomosis during axillary or inguinal node dissection for preventing secondary lymphoedema](#). **[2025]**

For a short explanation of why the committee made the 2025 recommendations and how they might affect practice, see the [rationale and impact section on lymphoedema: early identification and risk reduction](#).

Full details of the evidence and the committee's discussion are in:

- [evidence review B: management of the positive axilla](#)
- [evidence review O: non-pharmacological prevention of lymphoedema in people who have, or have had, breast cancer](#).

## Specialist lymphoedema services

- 1.14.6 Ensure that people with breast cancer who develop lymphoedema are referred to a specialist lymphoedema service for further assessment, and to discuss possible management options (for example, conservative management, surgical options), as soon as possible. **[2009, amended 2025]**

## Lymphoedema education

- 1.14.7 Discuss the following topics with people with lymphoedema, and also provide them with information in a suitable format to take away and refer to later:
- lymphoedema and its management options
  - skin and nailcare to prevent complications of lymphoedema
  - support groups
  - how to recognise the serious complications of lymphoedema that need urgent medical attention, for example cellulitis or deep vein thrombosis. **[2025]**

## Lymphoedema management

- 1.14.8 Assess people with lymphoedema for other treatable underlying factors (for example, nodal disease and cellulitis) before starting any lymphoedema management programme. **[2025]**
- 1.14.9 Offer compression therapy as the first stage of lymphoedema management. Make a shared decision with the person about the form of compression that is best for them. **[2025]**
- 1.14.10 If compression therapy is not appropriate or not comfortable, some people might wish to try kinesiology tape. **[2025]**
- 1.14.11 Reassure people that there is no evidence that physical activity (including upper limb exercise) will worsen their lymphoedema and explain that it may improve their overall quality of life. **[2025]**

For a short explanation of why the committee made the 2025 recommendations and how they might affect practice, see the [rationale and impact section on lymphoedema management](#).

Full details of the evidence and the committee's discussion are in [evidence review P: non-pharmacological management of lymphoedema in people who have, or have had, breast cancer](#).

## Arm and shoulder mobility

- 1.14.12 Ensure breast care units have documented local guidelines in place for postoperative physiotherapy that have been agreed with the physiotherapy department. Guidelines should cover:
- details of the [upper limb exercises](#) to be carried out after surgical or radiotherapy interventions
  - situations where the exercises should be tailored for individual circumstances and needs
  - who should give information and instructions, and at what points in the person's care this should happen
  - how healthcare staff can best deliver information about the exercises. **[2023]**
- 1.14.13 Give people who are going to have surgery or radiotherapy for breast cancer instructions and information on upper limb exercises before their treatment begins:
- explain the benefits of doing the exercises
  - explain when the exercises should be started
  - ensure the information is in a format suitable for the person to take away to refer to later
  - answer any questions the person may have on the exercises, or how to perform them

- give details about who to contact if more information is needed.

Also see the [section on communication in the NICE guideline on patient experience in adult NHS services](#). **[2023]**

1.14.14 Preoperatively identify people who are having surgery for breast cancer as being at high risk of developing shoulder problems if they have any of the following factors:

- any pre-existing shoulder conditions, such as:
  - history of shoulder surgery
  - shoulder trauma injury (fracture or shoulder dislocation)
  - frozen shoulder
  - osteoarthritis or rheumatoid arthritis affecting the shoulder
  - non-specific shoulder pain
  - stiffness
  - decreased function
- their BMI is over 30 kg/m<sup>2</sup>
- they have axillary node clearance planned
- they have radiotherapy to the axilla or supraclavicular nodes planned. **[2023]**

1.14.15 After surgery, if a person with breast cancer needs previously unplanned axillary node clearance or radiotherapy to the axilla or supraclavicular nodes, identify them as being at high risk. **[2023]**

1.14.16 Offer supervised support when performing upper limb exercises to people who have been identified as being at high risk of developing shoulder problems after surgery for breast cancer (see recommendation 1.12.7 for assessment). **[2023]**

1.14.17 Consider supervised support when performing upper limb exercises for people who:

- are having surgery and have not been identified as being at high risk of developing shoulder problems (as defined by the criteria in recommendation 1.12.7), but who may still benefit from supervised support **or**
- are having radiotherapy without surgery. **[2023]**

1.14.18 Ensure supervised support for upper limb exercises:

- is available as either individual, group or virtual support, depending on the person's circumstances, needs and preferences
- is tailored to the person's needs (for example, modifying exercises for people with more complex needs)
- includes checking that the person is performing the activity correctly
- is delivered by physiotherapy staff members or other appropriately trained allied health professionals. **[2023]**

1.14.19 Refer people to the physiotherapy department for individual assessment and treatment if they report a persistent reduction in arm and shoulder mobility after breast cancer surgery or radiotherapy. **[2023]**

For a short explanation of why the committee made the 2023 recommendations and how they might affect practice, see the [rationale and impact section on arm and shoulder mobility](#).

Full details of the evidence and the committee's discussion are in [evidence review L: strategies for reducing arm and shoulder problems after breast cancer surgery or radiotherapy](#).

## Menopausal symptoms

See also [recommendations in the NICE guideline on menopause](#) and the [section on covering people with a personal history of breast cancer](#).

1.14.20 Offer women information and counselling about the possibility of early

menopause and menopausal symptoms associated with breast cancer treatment. **[2009]**

1.14.21 Stop systemic hormone replacement therapy (HRT) in women who are diagnosed with breast cancer. **[2009]**

1.14.22 Do not routinely offer HRT (including oestrogen/progestogen combination) to women with menopausal symptoms and a history of breast cancer. **[2009, amended 2023]**

In March 2025, this was an off-label use of HRT, and HRT is contraindicated in women with a history of breast cancer. See [NICE's information on prescribing medicines](#).

1.14.23 In exceptional circumstances, offer HRT to women with severe menopausal symptoms and a history of breast cancer after a discussion of the associated risks. **[2009, amended 2023]**

In March 2025, this was an off-label use of HRT, and HRT is contraindicated in women with a history of breast cancer. See [NICE's information on prescribing medicines](#).

1.14.24 Consider selective serotonin reuptake inhibitor (SSRI) antidepressants for women with breast cancer for relieving menopausal symptoms, particularly hot flushes, but not for those taking tamoxifen. For guidance on safe prescribing of antidepressants (such as SSRIs) and managing withdrawal, see [NICE's guideline on medicines associated with dependence or withdrawal symptoms](#). **[2009, amended 2018]**

In March 2025, this was an off-label use of SSRIs. See [NICE's information on prescribing medicines](#).

1.14.25 Do not offer soy (isoflavone), red clover, black cohosh, vitamin E or magnetic devices to treat vasomotor symptoms in women with breast cancer. **[2009, amended 2023]**

## Bone health

- 1.14.26 Offer a baseline dual-energy X-ray absorptiometry (DEXA) scan to assess bone mineral density in women with invasive breast cancer who are not receiving bisphosphonates as adjuvant therapy and who:
- are starting adjuvant aromatase inhibitor treatment **or**
  - have treatment-induced menopause **or**
  - are starting ovarian ablation/suppression therapy. **[2009, amended 2018]**
- 1.14.27 Do not offer a DEXA scan to people with invasive breast cancer who are receiving tamoxifen alone. **[2009, amended 2023]**
- 1.14.28 Offer bisphosphonates to women identified by [algorithms 1 and 2 in the guidance for the management of breast cancer treatment-induced bone loss: a consensus position statement from a UK expert group](#) (2008; this guidance is not NICE-accredited). **[2009]**

## 1.15 Follow-up

### Follow-up imaging

- 1.15.1 Offer annual mammography for 5 years to all people who have had or are being treated for breast cancer, including DCIS. For women, continue annual mammography past 5 years until they enter the NHS Breast Screening Programme (NHSBSP) in England or the Breast Test Wales Screening Programme (BTWSP) in Wales. **[2009, amended 2023]**
- 1.15.2 Do not perform mammography of the ipsilateral soft tissues after mastectomy. **[2009]**
- 1.15.3 Do not routinely use ultrasound or MRI for post-treatment surveillance in people who have had treatment for invasive breast cancer or DCIS. **[2009, amended 2023]**

## Clinical follow-up

- 1.15.4 Ensure all people who have had treatment for breast cancer have an agreed, written care plan, recorded in their notes by a named healthcare professional (or professionals) from the multidisciplinary team. Give a copy to the person and to their GP. The plan should include:
- designated named healthcare professionals
  - dates for review of any adjuvant therapy
  - details of surveillance mammography
  - signs and symptoms to look out for and seek advice on
  - contact details for immediate referral to specialist care
  - contact details for support services, for example, support for people with lymphoedema. **[2009, amended 2023]**

## 1.16 Lifestyle

- 1.16.1 Advise people who have had or are being treated for breast cancer that a healthy lifestyle is associated with a lower risk of recurrence, and that this should include:
- achieving and maintaining a healthy weight (see the [NICE guideline on overweight and obesity management](#))
  - limiting alcohol intake to below 5 units per week
  - regular physical activity (see the [NICE guideline on physical activity for adults](#)). **[2018]**
- 1.16.2 For guidance on smoking cessation, see the [NICE guideline on tobacco: preventing uptake, promoting quitting and treating dependence](#). **[2018]**

For a short explanation of why the committee made the 2018 recommendations and how they might affect practice, see the [rationale and impact section on lifestyle](#).

Full details of the evidence and the committee's discussion are in [evidence review K: lifestyle](#).

## 1.17 Locally advanced inoperable disease

See also the [NICE guideline on advanced breast cancer](#).

- 1.17.1 Eribulin is recommended as an option in NICE technology appraisal guidance for treating locally advanced breast cancer only when it has progressed after at least 2 chemotherapy regimens (which may include an anthracycline or a taxane, and capecitabine). For full details, see the [guidance on eribulin \(TA423, 2016\)](#).

### Triple-negative breast cancer

- 1.17.2 For medicines recommended as options in NICE technology appraisal guidance for treating triple negative, locally advanced breast cancer in some people, see the guidance on:

- [talazoparib \(TA952, 2024\)](#)
- [sacituzumab govitecan \(TA819, August 2022\)](#)
- [pembrolizumab plus chemotherapy \(paclitaxel or nab-paclitaxel\) \(TA801, June 2022\)](#)
- [atezolizumab with nab-paclitaxel \(TA639, 2020\)](#).

### HER2-positive breast cancer

- 1.17.3 For medicines recommended as options in NICE technology appraisal guidance for treating HER2-positive, locally advanced breast cancer in some people, see

the guidance on:

- [tucatinib with trastuzumab and capecitabine \(TA786, 2022\)](#)
- [pertuzumab, in combination with trastuzumab and docetaxel \(TA509, 2018\)](#)
- [trastuzumab emtansine \(TA458, 2017\)](#).

## Hormone receptor-positive, HER2-negative breast cancer

1.17.4 For medicines recommended as options in NICE technology appraisal guidance for treating hormone receptor-positive, HER2-negative, locally advanced breast cancer in some people, see the guidance on:

- [talazoparib \(TA952, 2024\)](#)
- [palbociclib with fulvestrant \(TA836, October 2022\)](#)
- [alpelisib plus fulvestrant \(TA816, August 2022\)](#)
- [abemaciclib with fulvestrant \(TA725, September 2021\)](#)
- [ribociclib with fulvestrant \(TA687, March 2021\)](#)
- [abemaciclib with an aromatase inhibitor \(TA563, 2019\)](#)
- [ribociclib with an aromatase inhibitor \(TA496, December 2017\)](#)
- [palbociclib with an aromatase inhibitor \(TA495, December 2017\)](#)
- [everolimus with exemestane \(TA421, 2016\)](#).

## Treatments not recommended

1.17.5 For medicines not recommended in NICE technology appraisal guidance for treating locally advanced breast cancer in some people, see the guidance on:

- [eribulin \(TA515, March 2018\)](#)
- [fulvestrant \(TA503, January 2018\)](#) for untreated oestrogen-receptor-positive

breast cancer

- [fulvestrant \(TA239, 2011\)](#) for oestrogen-receptor-positive breast cancer that has relapsed or progressed on or after anti-oestrogen therapy.

## Terms used in this guideline

### Triple negative breast cancer

Triple negative breast cancer is defined as ER/PR/HER2, where each has been scored as negative according to local multidisciplinary team guidelines.

### Upper limb exercises

Upper limb exercises predominantly focus on gentle shoulder range-of-movement exercises and stretches aimed at regaining full and pain-free range of movement of the shoulder following breast cancer surgery and/or radiotherapy. The term can also refer to exercises that progress onto strengthening the shoulder and arm.

# Recommendations for research

The guideline committee has made the following key recommendations for research.

## Key recommendations for research

### 1 Breast reconstruction

What are the long-term outcomes for breast reconstruction in women having radiotherapy to the chest wall? [2018]

For a short explanation of why the committee made the recommendation for research, see the [rationale section on breast reconstruction](#).

Full details of the evidence and the committee's discussion are in [evidence review I: postmastectomy radiotherapy](#).

### 2 Neoadjuvant endocrine therapy in premenopausal women

Is neoadjuvant endocrine therapy safe in premenopausal women with early breast cancer? [2018]

For a short explanation of why the committee made the recommendation for research, see the [rationale section on neoadjuvant endocrine therapy](#).

Full details of the evidence and the committee's discussion are in [evidence review J: neoadjuvant treatment of early and locally advanced breast cancer](#).

## Other recommendations for research

### 3 Neoadjuvant treatment

What are the indications for postmastectomy radiotherapy after neoadjuvant chemotherapy? **[2018]**

For a short explanation of why the committee made the recommendation for research, see the [rationale section on radiotherapy after neoadjuvant chemotherapy](#).

Full details of the evidence and the committee's discussion are in [evidence review J: neoadjuvant treatment of early and locally advanced breast cancer](#).

### 4 Strategies to reduce arm and shoulder problems

What is the most effective and cost-effective way of delivering the intervention (for example, type of physiotherapy or exercise, mode of delivery, number of sessions) to reduce arm and shoulder problems after breast cancer surgery or radiotherapy, and what is the acceptability of the intervention for different groups, such as:

- women, men, trans people and non-binary people
- people from minority ethnic family backgrounds
- people with learning disabilities or cognitive impairment, or physical disabilities, or both
- neurodiverse people? **[2023]**

For a short explanation of why the committee made the recommendation for research, see the [rationale section on arm and shoulder mobility](#).

Full details of the evidence and the committee's discussion are in [evidence review L: strategies for reducing arm and shoulder problems after breast cancer surgery or radiotherapy](#).

## 5 Adherence and satisfaction for interventions to reduce arm and shoulder problems

What is the adherence to, and satisfaction with, different intervention formats (for example, individual, group, virtual, and face to face) to reduce arm and shoulder problems after breast cancer surgery or radiotherapy, and what is the impact of greater adherence on effectiveness for different groups, such as:

- women, men, trans people and non-binary people
- people from minority ethnic family backgrounds
- people with learning disabilities or cognitive impairment, or physical disabilities, or both
- neurodiverse people? [2023]

For a short explanation of why the committee made the recommendation for research, see the [rationale section on arm and shoulder mobility](#).

Full details of the evidence and the committee's discussion are in [evidence review L: strategies for reducing arm and shoulder problems after breast cancer surgery or radiotherapy](#).

## 6 Effectiveness of 26 Gy in 5 fractions over 1 week regimen in people receiving breast reconstruction

What is the effectiveness of radiotherapy given in 26 Gy in 5 fractions over 1 week compared with 40 Gy in 15 fractions over 3 weeks in people with early or locally advanced invasive breast cancer who are offered breast reconstruction? [2023]

For a short explanation of why the committee made the recommendation for research, see the [rationale section on dose fractionation of external beam radiotherapy](#).

Full details of the evidence and the committee's discussion are in [evidence review M: effectiveness of different external beam hypofractionation radiotherapy regimens in people with early-stage or locally advanced invasive breast cancer](#).

## 7 Effectiveness of 26 Gy in 5 fractions over 1 week regimen in people receiving nodal irradiation

What is the effectiveness of radiotherapy given in 26 Gy in 5 fractions over 1 week compared with 40 Gy in 15 fractions over 3 weeks in people with early or locally advanced invasive breast cancer who are also offered nodal irradiation? **[2023]**

For a short explanation of why the committee made the recommendation for research, see the [rationale section on dose fractionation of external beam radiotherapy](#).

Full details of the evidence and the committee's discussion are in [evidence review M: effectiveness of different external beam hypofractionation radiotherapy regimens in people with early-stage or locally advanced invasive breast cancer](#).

## 8 Lymphovenous anastomosis

What is the effectiveness of lymphovenous anastomosis during axillary lymph node dissection for reducing the risk of secondary lymphoedema and what is the acceptability of the intervention for different groups, such as:

- women, men, trans people and non-binary people
- people from ethnic minority backgrounds
- people with disabilities. **[2025]**

## 9 Vascularised lymph node transfer

What is the effectiveness of vascularised lymph node transfer during axillary lymph node dissection for reducing the risk of secondary lymphoedema, and what is the acceptability of the intervention for different groups, such as:

- women, men, trans people and non-binary people
- people from ethnic minority backgrounds
- people with disabilities. [2025]

For a short explanation of why the committee made the recommendations for research on lymphovenous anastomosis and vascularised lymph node transfer, see the [rationale section on lymphoedema: early identification and risk reduction](#).

Full details of the evidence and the committee's discussion are in [evidence review O: non-pharmacological prevention of lymphoedema in people who have, or have had, breast cancer](#).

## 10 Lymphoedema core outcomes set

What are the most reliable, valid and clinically relevant outcomes and measures for assessing lymphoedema severity and clinical effectiveness of lymphoedema treatments? [2025]

## 11 Lymphoedema surgical intervention: lymphovenous anastomosis (LVA) and vascularised lymph node transfer (VLNT).

What is the effectiveness and cost effectiveness of lymphovenous anastomosis (LVA) and vascularised lymph node transfer (VLNT) in the management of breast-cancer-related lymphoedema, and what is the acceptability of the intervention for different groups, such as:

- women, men, trans people and non-binary people
- people from ethnic minority backgrounds

- people with disabilities. [2025]

## 12 Breast oedema management

What are the most effective interventions for the management of breast oedema for people who have or have had breast cancer, and what is the acceptability of the intervention for different groups, such as:

- women, men, trans people and non-binary people
- people from ethnic minority backgrounds
- people with disabilities. [2025]

For a short explanation of why the committee made the recommendations for research on lymphoedema core outcomes set, lymphoedema surgical intervention and breast oedema management, see the [rationale section on lymphoedema management](#).

Full details of the evidence and the committee's discussion are in [evidence review P: non-pharmacological management of lymphoedema in people who have, or have had, breast cancer](#).

## 13 Neoadjuvant treatment of triple-negative breast cancer

- What is the clinical and cost effectiveness of adding a platinum to a neoadjuvant chemotherapy regimen in people with invasive breast cancer who have a germline BCRA mutation, but who do not have triple-negative breast cancer?
- What is the real-world evidence on clinical and cost effectiveness of adding a platinum to a neoadjuvant chemotherapy regimen in people with invasive breast cancer that is triple negative and/or with a germline BRCA mutation who are often excluded from clinical trials, such as:
  - people 65 years and older **or**
  - people who are pregnant **or**
  - people with male reproductive organs?

For a short explanation of why the committee made the recommendation for research on neoadjuvant treatment of triple-negative breast cancer, see the [rationale section on neoadjuvant treatment of triple-negative breast cancer](#).

Full details of the evidence and the committee's discussion are in [evidence review S: platinum based neoadjuvant chemotherapy](#).

## 14 Adjuvant endocrine therapy for ER positive invasive breast cancer

### People with female reproductive organs (women, trans men and non-binary people who currently have ovaries)

- What is the real-world evidence on the long-term adverse events and effects on quality of life of using ovarian function suppression in combination with either tamoxifen or an aromatase inhibitor in premenopausal people with ER-positive invasive breast cancer?

For a short explanation of why the committee made the recommendation for research on adjuvant endocrine therapy for ER-positive invasive breast cancer: people with female reproductive organs (women, trans men and non-binary people who currently have ovaries), see the [rationale section on adjuvant endocrine therapy for ER-positive invasive breast cancer: people with female reproductive organs](#).

Full details of the evidence and the committee's discussion are in [evidence review Q: ovarian function suppression](#).

### People with male reproductive organs (men, trans women and non-binary people who currently have testes)

- What is the real-world evidence on the clinical and cost effectiveness of testicular function suppression in combination with an aromatase inhibitor compared to tamoxifen alone or an aromatase inhibitor alone in people with ER-positive invasive breast cancer who have male reproductive organs?

For a short explanation of why the committee made the recommendation for research on adjuvant endocrine therapy for ER-positive invasive breast cancer: people with male reproductive organs (men, trans women and non-binary people who currently have testes), see the [rationale section on adjuvant endocrine therapy for ER-positive invasive breast cancer: people with male reproductive organs](#).

Full details of the evidence and the committee's discussion are in [evidence review R: testicular function suppression](#).

## Rationale and impact

These sections briefly explain why the committee made the recommendations and how they might affect practice. They link to details of the evidence and a full description of the committee's discussion.

## Providing information and psychological support

[Recommendations 1.1.1 to 1.1.4](#)

### Why the committee made the recommendations

The committee agreed, based on their clinical expertise, that continued improvement in breast cancer survival as well as post-diagnosis quality of life needs ongoing research into new or refined treatment options to allow further optimisation of care.

People having treatment for breast cancer should be advised about options for preserving their fertility, so the existing NICE guideline on this topic was cross-referred to.

### How the recommendations might affect practice

Recruitment into clinical trials wherever possible is already standard practice, so the recommendation is unlikely to result in a change in practice.

Discussion of fertility options is already standard practice, so the recommendation is unlikely to result in a change in practice.

[Return to recommendations](#)

## Predictive factors

[Recommendations 1.3.1, 1.3.3 and 1.3.5](#)

## Why the committee made the recommendations

There was not enough good evidence, so the committee agreed, using a formal consensus scoring system and their knowledge and experience, that progesterone receptor (PR) status should be assessed for all invasive breast cancers because:

- it will help when tailoring adjuvant therapy
- it will reduce delays in starting treatment
- if people are already having testing at this stage, their PR status can be assessed without them having to wait for additional test results.

The committee also agreed that oestrogen receptor (ER), PR and human epidermal growth factor receptor 2 (HER2) status assessments should be requested simultaneously at the time of initial diagnosis to ensure that results are available at the initial preoperative multidisciplinary team meeting (as well as the postoperative meeting). This will avoid delays and the need for additional discussions.

## How the recommendations might affect practice

Most people with invasive breast cancer have PR testing in current practice, although it is not always performed at diagnosis. The recommendations should reduce variation in practice and delays in starting treatment, and the need for pathology results to be discussed at more than 1 multidisciplinary meeting, so may lead to a small cost saving.

[Return to recommendations](#)

## Surgery to the breast

[Recommendation 1.4.3](#)

### Why the committee made the recommendation

There was some evidence that there was a reduced risk of ductal carcinoma in situ (DCIS) local recurrence if tissue margins were greater than 0 mm, so the committee recommended further surgery (re-excision or mastectomy) to extend the margins if needed. Although there was no consistent evidence about tissue margins for invasive breast cancer, the committee agreed that further surgery should be offered.

The committee agreed that complete excision of the tumour with clear margins was essential for the high-quality care of people with DCIS or invasive breast cancer.

There was not enough evidence to clearly define an optimum margin width between 0 mm and 2 mm to minimise local recurrence rates and minimise further surgery.

## How the recommendation might affect practice

The rates of further surgery currently vary across the country. Although the committee noted that the recommendation will reinforce current best practice, there may be some centres that will need to amend their practice in order to follow this recommendation.

[Return to recommendation](#)

## Further surgery after breast-conserving surgery

[Recommendations 1.4.4 to 1.4.6](#)

### Why the committee made the recommendations

The committee agreed that the best choice for radial margin size would be a balance between the need for further surgery (to reduce the risk of local recurrence and maximise overall survival) and maintaining good levels of patient satisfaction. This balance also needs to take into account the potential harms of further surgery, and possible need for other treatments to take priority over further surgery. Because of the way the evidence was reported in the included studies, the committee discussed the evidence on radial margins after breast-conserving surgery separately for people who had invasive breast cancer with or without DCIS and for people who had DCIS only. Most of the data was for local recurrence, with some for distant recurrence and very limited data for overall survival or breast-cancer-specific survival. There was no evidence on patient-reported outcomes or quality of life. Therefore, the committee based most of their discussion on the evidence for local recurrence, and used their personal and clinical experience to consider the perspectives and preferences of people who have breast cancer.

The committee discussions focused on whether a radial margin of 1 mm or 2 mm should be the cut-off for further surgery. The committee agreed that when the tumour is at 0 mm, this balance is strongly in favour of further surgery to try to ensure the full tumour is

removed, so the existing recommendation to offer further surgery was retained without reviewing the evidence. For people with invasive breast cancer with or without DCIS, the evidence showed that the risk of local recurrence was higher with radial margins of greater than 0 mm to less than 1 mm compared with greater than or equal to 1 mm. This was also the case for local recurrence when radial margins of greater than 0 mm to 2 mm were compared with greater than 2 mm. However, the evidence could not differentiate between greater than 1 mm to 2 mm compared with greater than 2 mm. The committee also noted that the incidence of local recurrence has decreased because of advances in breast cancer care.

Taking this into account with the evidence for local recurrence, the committee did not think that recommending a margin of 1 mm, rather than 2 mm, would lead to a substantially increased risk of local recurrence. Additionally, they agreed that for many people, a margin of 1 mm is likely to be preferable over a more cautious approach with a margin of 2 mm because the smaller margin is likely to achieve better breast preservation and result in fewer additional surgeries. They noted that repeated surgeries negatively affect breast appearance, and this can have a negative effect on the person's self-esteem and view of themselves. They are also traumatic for the person involved and can lead to stress, infections, pain, complications associated with recovery from the anaesthetic and operation, and negatively affect their everyday life. As a result, the committee agreed that further surgery should be considered for people who had breast-conserving surgery for invasive breast cancer with or without DCIS if tumour cells are present within 1 mm of the radial margins.

For DCIS only, the limited evidence was of moderate to very low quality, and the committee was not confident of the differences in effect between a margin of less than, or greater than, 2 mm on local recurrence. As a result, they decided to retain the threshold of 2 mm from the existing recommendation when considering further surgery for this population. The committee did not make a recommendation for research for this group because they were aware of new studies already underway that could inform this decision in the future.

As well as thinking about the potential clinical benefits of further surgery, the committee acknowledged the importance of taking the person's circumstances, needs and preferences into account as part of the decision-making process. This is intended to help ensure that any barriers to particular treatment options are considered and addressed where possible. They recommended that there should be a discussion with the person about the benefits of surgery, such as reducing the risk of recurrence, as well as risks,

such as infection and complications. The committee also agreed other clinical factors, such as tumour characteristics and potential treatments, should be taken into account. They referred to the NICE guidelines on shared decision making and patient experience to help inform these discussions.

The committee noted that, in their experience, the existing recommendation about auditing recurrence is not uniformly applied and that the information recorded does not necessarily include the radial margin. They therefore expanded the recommendation to highlight factors that they thought should be recorded in addition to recurrence. The committee was also aware of a new [National Audit of Primary Breast Cancer](#) that may improve recording of this information.

The committee noted that there was no evidence for people receiving neoadjuvant hormone therapy or biological treatments and very little evidence for people receiving neoadjuvant chemotherapy, and that the quality of this evidence was very low. Therefore, they could not make a specific recommendation for this group. However, they agreed that the evidence for people who did not have neoadjuvant therapy could be extrapolated to this group and that the recommendation for people with invasive breast cancer with or without DCIS could apply to them as well.

## How the recommendations might affect practice

It is not expected that the recommendation for people with invasive breast cancer will increase resource use since it is likely that fewer people will have further surgery given the reduction in margin size. The recommendations should also encourage standardisation of practice in relation to radial margins for invasive breast cancer with or without DCIS across the UK. The recommendations for DCIS retain the existing radial margins and are therefore not expected to change practice or resource use.

[Return to recommendations](#)

## Evaluation and management of a positive axillary lymph node

[Recommendations 1.4.12 to 1.4.15](#)

## Why the committee made the recommendations

There was no new evidence that led the committee to change from the existing recommended practice (as recommended in the previous NICE guideline CG80) of:

- offering axillary clearance to people with preoperatively pathologically proven involvement of the axillary lymph nodes
- not offering axillary treatment after primary surgery to people with isolated tumour cells in their sentinel lymph nodes.

The committee agreed that current evidence shows that further axillary treatment after primary surgery does not improve survival for people with micrometastases and there are risks such as lymphoedema, so further treatment should not be offered to this population. There were unclear benefits and risks of further axillary treatment after primary surgery in people with only 1 or 2 sentinel lymph node macrometastases who have had breast-conserving surgery and have been advised to have whole-breast radiotherapy and systemic therapy, so the committee agreed that the risks and benefits of further treatment should be discussed with this group.

Studies of neoadjuvant therapy were excluded from the evidence review.

## How the recommendations might affect practice

The committee agreed that the recommendations will result in a minor change in practice because some centres currently use mainly surgery and may not use radiotherapy. In addition, more time may need to be factored in to plan and deliver radiotherapy treatment.

[Return to recommendations](#)

## Breast reconstruction

[Recommendations 1.5.2 to 1.5.5](#)

## Why the committee made the recommendations

There was not much good evidence, but the committee agreed that the main benefits of immediate breast reconstruction compared with delayed reconstruction are improved

aesthetic satisfaction, improved symmetry, improved health-related quality of life, lower overall rates of complications and a reduced need for further surgery. The committee agreed that in some circumstances, there are advantages to delayed reconstruction compared with immediate reconstruction (for example, reduced mastectomy flap loss and capsular contracture). Therefore, delayed reconstruction should also be an option for women who wish to have a reconstruction after mastectomy. The committee also agreed that the option of no reconstruction should also be discussed, because this may be the preferred option for some women.

In addition, although radiotherapy can impact on outcomes after breast reconstruction, there was no consistent evidence for worse outcomes between radiotherapy delivered after immediate reconstructions compared with radiotherapy before delayed reconstructions. Therefore, the committee agreed that immediate reconstruction should be offered regardless of plans for chest-wall radiotherapy.

There is little evidence regarding longer-term outcomes and different types of reconstruction. Because of this, the committee agreed that more research is needed to understand whether immediate breast reconstruction or delayed breast reconstruction is better in women who may need postmastectomy radiotherapy. So, they made a [recommendation for research on long-term outcomes for breast reconstruction in women having radiotherapy to the chest wall](#).

## How the recommendations might affect practice

The recommendations may result in a substantial change in practice because many centres do not routinely offer immediate breast reconstruction to all women (especially those who have been advised to have radiotherapy). The impact will depend on how many immediate reconstructions are already carried out. In addition, the uptake of immediate breast reconstruction will also depend on women's preferences. There may be cost savings associated with immediate reconstructions because fewer surgical procedures are needed (reconstruction is done at the same time as mastectomy and there are lower rates of additional symmetrisation surgery).

[Return to recommendations](#)

## Adjuvant therapy planning

[Recommendations 1.6.4 and 1.6.5](#)

## Why the committee made the recommendations

Good evidence showed that the prognostic tool PREDICT is an accurate tool to estimate prognosis and the benefits of treatment in most people.

## How the recommendations might affect practice

The committee agreed that most healthcare professionals already use the PREDICT tool, so this recommendation will not mean a big change in practice.

[Return to recommendations](#)

# Adjuvant chemotherapy for invasive breast cancer

[Recommendations 1.7.1 to 1.7.3](#)

## Why the committee made the recommendations

There was good evidence of improved survival when taxanes are added to anthracycline-based chemotherapy in people with node-positive and node-negative breast cancer. In both groups, the benefits and risks of treatment should be discussed because of the potential side effects associated with taxanes. Three-weekly docetaxel was identified as a regimen with potentially more toxicity than weekly or fortnightly paclitaxel.

## How the recommendations might affect practice

These recommendations may result in a substantial change in practice because of increased taxane use, particularly for people with node-negative breast cancer and comorbidities.

In addition, there will be an increase in weekly and fortnightly chemotherapy regimens being offered (for people who cannot tolerate 3-weekly regimens). These regimens have a higher cost because they are more resource intensive, and may affect capacity in chemotherapy services.

[Return to recommendations](#)

# Neoadjuvant treatment of triple-negative breast cancer

## Recommendation 1.8.1

### Why the committee made the recommendation

The committee agreed that the decision on whether neoadjuvant chemotherapy is suitable for a person is a complex one that should be made by a multidisciplinary team as covered in recommendations on systemic anti-cancer therapy planning. The committee recommended that people with triple negative breast cancer (TNBC) be offered a neoadjuvant chemotherapy regimen that contains a platinum, a taxane and an anthracycline because the evidence showed clinically meaningful improvements in overall survival, disease free survival and pathological complete response (signs of cancer disappearing in both the breast and lymph nodes in the axilla at surgery) after this treatment, compared to a regimen that contained a taxane and an anthracycline without a platinum. However, the evidence also showed an increased risk of some specific side effects with this regimen: anaemia, neutropenia (low numbers of white blood cells), thrombocytopenia (low number of platelets), and febrile neutropenia (a low number of neutrophils and temperature of 38°C or above on one occasion).

The committee agreed that the decision about which neoadjuvant chemotherapy regimen was the best option for a person with TNBC would be determined after a discussion with them on the balance of benefits (improvements to pathological complete response and survival) and harms (potential side effects, and their effects on quality of life). The committee also acknowledged the importance of taking the individual's circumstances, needs and preferences into account as part of the decision-making process.

There was only limited evidence for people who were 60 years and older and no evidence for people with breast cancer who have male reproductive organs or people who are pregnant. The committee noted that these groups are often not recruited into RCTs, but real-world evidence is available in databanks such as [SAIL](#) and [Systemic Anti-Cancer Therapy Dataset](#) that could be used to address these gaps. They therefore made a [recommendation for research for a study using this real-world evidence to look at the clinical and cost effectiveness of platinum-based neoadjuvant chemotherapy for these groups of people](#). The committee agreed that despite the lack of direct evidence, people aged 60 years and older and people with male reproductive organs may also benefit from

platinum based neoadjuvant chemotherapy.

Where people have TNBC and BRCA germline mutations, the committee agreed that they should be offered the same neoadjuvant chemotherapy options as other people with TNBC (that is, a regimen that contains a platinum, a taxane and an anthracycline) as there was no evidence to support treating them differently based on their BRCA germline mutation status. As a result, they did not make a separate recommendation for this population. However, for people with BRCA germline mutations of any receptor subtype other than triple negative (this could be any combination of positive or negative oestrogen receptor, progesterone receptor or human epidermal growth factor receptor 2) the committee were unable to determine whether treatment with a neoadjuvant chemotherapy regimen containing a platinum, a taxane and an anthracycline was beneficial in terms of improved survival and other important outcomes, so they made a [recommendation for research to cover this gap in the evidence](#).

## How the recommendation might affect practice

The committee agreed that neoadjuvant chemotherapy including a platinum-based chemotherapy is already current practice in many locations across the UK. The recommendation may increase this figure and might lead to an initial increase in NHS spending. However, downstream savings caused by fewer recurrences will likely offset the higher costs of increased use of this neoadjuvant treatment.

The recommendations should also encourage standardisation of practice across the UK.

[Return to recommendation](#)

## Neoadjuvant treatment of HER2-positive breast cancer

[Recommendation 1.9.1](#)

### Why the committee made the recommendation

The committee looked at evidence comparing the use of a platinum and a taxane based neoadjuvant chemotherapy regimen to an anthracycline and a taxane based regimen for people with HER2-positive invasive breast cancer. There was limited evidence available,

and it was not able to differentiate between the 2 neoadjuvant chemotherapy regimens for key outcomes including pathological complete response, all-cause mortality and recurrence. The committee therefore concluded that there was insufficient evidence to support recommending one regimen over the other.

The committee noted that neoadjuvant therapy is not necessary for some small HER2-positive tumours. They agreed that the decision whether neoadjuvant chemotherapy is suitable for a person is a complex one that should be made by a multidisciplinary team as covered in recommendations on systemic anti-cancer therapy planning. This would take into account the eligibility criteria related to any relevant NICE technology appraisals (TA) and the chemotherapy regimens that are commissioned for use with them. Although there is only one related TA at the time of publication, the committee agreed the recommendation should make allowances for other options as they become available in future.

The committee agreed that, although the evidence came from trials that recruited women with breast cancer, this recommendation would also apply to people with male reproductive organs because the biological mechanism of action of neoadjuvant chemotherapy is expected to be the same as for people with female reproductive organs.

## How the recommendations might affect practice

It is not expected that the recommendation will increase resource use, as it is likely that many clinicians are already using these regimens in routine practice already.

[Return to recommendation](#)

## Biological therapy

[Recommendation 1.9.6](#)

### Why the committee made the recommendation

There was evidence that adjuvant trastuzumab can improve disease-free survival and overall survival in some people with T1a and T1b HER2-positive invasive breast cancer who were treated with adjuvant trastuzumab and chemotherapy. However, only a small number of people will benefit from this treatment and, because trastuzumab can cause heart

problems, it is important to avoid offering it to people who do not need it. Because of this, the committee agreed that adjuvant trastuzumab should be an option for women with T1a and T1b tumours rather than a standard treatment.

Combined chemotherapy and trastuzumab was not found to be cost effective when compared with chemotherapy alone. However, the committee agreed that it was more appropriate to compare combined chemotherapy and trastuzumab with no treatment because these are the strategies that are likely to be used in clinical practice. Because it is the HER2 positivity that increases risk of recurrence for people with small (T1a and T1b) tumours, it does not make sense from a clinical perspective to not treat the component that is increasing risk (that is, trastuzumab treatment for HER2 positivity). Further, the effect of chemotherapy alone in the economic model may be overestimated because the data may not fully reflect the population under consideration.

## How the recommendation might affect practice

Currently, T1 tumours are not routinely treated with adjuvant trastuzumab, so this recommendation will lead to a change in practice. However, the committee agreed that the number of additional people having treatment would be small, so the impact on current practice would be minor and unlikely to require a substantial increase in resources.

[Return to recommendation](#)

## Neoadjuvant chemotherapy

[Recommendations 1.10.1 and 1.10.2](#)

### Why the committee made the recommendations

There was good evidence to say that having chemotherapy before surgery (neoadjuvant chemotherapy) enables some women to have breast-conserving surgery who would otherwise have had total removal of their breast. The committee agreed that the response to neoadjuvant therapy could help guide the choice of subsequent adjuvant therapy.

### How the recommendations might affect practice

The committee agreed that the recommendations would not result in a major change in

practice because neoadjuvant chemotherapy is already offered in many centres. These recommendations will help improve consistency in practice.

[Return to recommendations](#)

## Neoadjuvant endocrine therapy

[Recommendations 1.11.1 to 1.11.3](#)

### Why the committee made the recommendations

For postmenopausal women, there was some evidence that breast conservation rates, changes in tumour size and overall survival are the same with neoadjuvant endocrine therapy and neoadjuvant chemotherapy. Endocrine therapy is safer and has fewer side effects than chemotherapy, but there was not enough evidence to recommend endocrine therapy over chemotherapy for every woman. The committee agreed that healthcare professionals should discuss the potential benefits and risks with women to help them decide which treatment is right for them and that more research is needed to say whether neoadjuvant endocrine therapy is as effective as neoadjuvant chemotherapy.

The evidence for premenopausal women showed that neoadjuvant chemotherapy was more effective than endocrine therapy, but that endocrine therapy may be effective in some women. However, some women may prefer endocrine therapy because it is safer and has fewer side effects. Because of this, the committee agreed that healthcare professionals should discuss the potential benefits and risks with women to help them decide which treatment is right for them. The committee agreed that more research is needed on the long-term safety of neoadjuvant endocrine therapy, and to identify which premenopausal women will benefit from it. So, they made a [recommendation for research on the safety of neoadjuvant endocrine therapy in premenopausal women](#).

### How the recommendations might affect practice

Neoadjuvant endocrine therapy is already being used, although there may be an increase in the number of people being offered it.

[Return to recommendations](#)

## Adjuvant endocrine therapy for ER-positive invasive breast cancer

### Recommendation 1.11.5

#### Why the committee made the recommendation

The committee noted that, in the 2018 version of this guideline, there were separate recommendations to offer endocrine therapy to people with ER-positive invasive breast cancer who are premenopausal or perimenopausal or who have male reproductive organs, and for people who are postmenopausal. They agreed that it would be clearer to have a single overarching recommendation on endocrine therapy before giving advice about which therapy is suitable for each population separately, and so revised the recommendations accordingly.

### Return to recommendation

## People with female reproductive organs (women, trans men and non-binary people who currently have ovaries)

### Recommendation 1.11.6

#### Why the committee made the recommendation

The evidence showed improvements in disease-free survival and reduced local or locoregional recurrence with ovarian function suppression (OFS) in combination with tamoxifen or OFS in combination with aromatase inhibitor treatment (AIT) compared to tamoxifen alone for premenopausal people who have ER-positive invasive breast cancer. For overall survival the evidence could not differentiate when OFS in combination with tamoxifen was compared to OFS in combination with AIT, but there was an improvement with OFS in combination with tamoxifen compared to tamoxifen alone. There was a reduced risk of new contralateral disease with OFS in combination with AIT compared to tamoxifen alone, but the evidence could not differentiate between OFS in combination with tamoxifen compared to tamoxifen alone. However, the evidence also showed an increased risk of some side effects with these treatments when compared to tamoxifen alone.

The committee agreed that the benefits in terms of cancer-related outcomes from using

OFS in combination with AIT or OFS in combination with tamoxifen compared to tamoxifen alone were clear enough to recommend the option of OFS as part of initial endocrine therapy as well as retaining the option of treatment with tamoxifen alone.

The committee agreed that, for some premenopausal people with ER positive invasive breast cancer, the balance of benefits in terms of improvements in cancer-related outcomes from taking OFS in combination with AIT or in combination with tamoxifen compared to taking tamoxifen alone would outweigh the side effects and their impact on quality of life as a result of inducing a menopausal state. This includes people at higher risk of disease recurrence. However, they agreed that some people at lower risk would also choose to accept this treatment, and other people at low or high risk may choose to take tamoxifen instead. They therefore made a recommendation on making a shared decision about which type of endocrine therapy would be suitable.

The committee highlighted that perimenopausal people were not excluded by any of the included trials, and that most of these trials defined premenopausal status in a way that could be interpreted that perimenopausal people were also included. Therefore, the committee agreed that the evidence could be extrapolated to include perimenopausal people.

The committee also acknowledged the importance of taking the individual's circumstances, needs and preferences into account as part of the decision-making process. To help the person make an informed decision, the committee recommended that there should be a discussion with them about the benefits of this type of endocrine treatment, such as improving overall survival and disease-free survival, as well as risks, such as side effects of this treatment and included a table to support this. They also emphasised the possible side effects of each treatment option should be discussed. Some of these can be managed with support or other treatments, and the committee agreed that it was important for people to be aware of this before they made their decision. However, the long-term consequences of these treatments and effects on quality of life from inducing the menopause prematurely are unclear. Therefore, the committee made a recommendation for research to gather evidence on this topic.

## How the recommendations might affect practice

It is not expected that the recommendations to offer endocrine therapy using tamoxifen alone, or ovarian function suppression in combination with either tamoxifen or AIT, will significantly increase resource use as many locations are already using these types of

endocrine therapy in routine practice. The recommendations should also encourage standardisation of practice across the UK.

[Return to recommendation](#)

## **People with male reproductive organs (men, trans women and non-binary people who currently have testes)**

[Recommendations 1.11.9 to 1.11.12](#)

### **Why the committee made the recommendations**

The committee agreed that, based on their experience, they would continue to recommend tamoxifen as the initial endocrine therapy for people with male reproductive organs who have ER-positive invasive breast cancer.

It was not possible to differentiate between testicular function suppression (TFS) in combination with aromatase inhibitor treatment (AIT) compared to either tamoxifen alone or AIT alone from the evidence. However, the committee were aware that there was other evidence from studies in healthy people with male reproductive organs suggesting that AIT alone does not reduce the levels of oestrogen enough that it could be used to exert an effect on oestrogen sensitive processes. Although this evidence is not directly relevant for people with ER-positive breast cancer, it means that AIT alone is unlikely to be sufficient to block the effects of oestrogen on ER-positive breast cancer in people with male reproductive organs. Therefore, the committee recommended that AIT should not be used alone to treat ER-positive breast cancer in people with male reproductive organs.

For people with ER-positive invasive breast cancer tamoxifen blocks the oestrogen receptor within tumour cells with the aim of reducing the risk of the tumour recurring, but if a person is unable to take tamoxifen, then other endocrine treatment options could be considered that may have a similar effect on reducing the risk of recurrence. Although the evidence was limited, the committee agreed that TFS in combination with AIT could be an alternative when tamoxifen is not suitable or is not tolerated. However, they also highlighted that TFS is given as injections of gonadotrophin-releasing hormone receptors (GnRH) agonists every 4 weeks or every 12 weeks (which could be inconvenient for some people) and that more side effects are expected with TFS in combination with AIT. The committee extrapolated from the evidence for people with female reproductive organs that showed an increased risk of adverse events with ovarian function suppression (OFS) in

combination with AIT compared to tamoxifen alone, and agreed that there were no biological reasons that the effect of this combined therapy would be different in terms of causing an increased risk of adverse events for people with male reproductive organs. However, they expected there to be some male-specific side effects such as erectile dysfunction and gynaecomastia that should be discussed when considering treatment options as part of making a shared decision.

The committee also agreed that bone mineral density should be assessed in people with male reproductive organs who have ER-positive invasive breast cancer and who start adjuvant endocrine therapy with TFS in combination with AIT because the use of AIT is associated with the risk of bone density loss. There is an existing recommendation ([recommendation 1.14.26 in the section on bone health](#)) that covers this for women who are taking AIT and the committee agreed that to prevent the introduction of a health inequality they should recommend a similar assessment for people with male reproductive organs.

The committee noted the lack of evidence in people with male reproductive organs who have ER-positive invasive breast cancer, and made a [recommendation for research](#) that could be carried out using real-world evidence because of the expected difficulty recruiting to randomised controlled trials. They also noted that side effects in people with male reproductive organs who have ER-positive invasive breast cancer are expected to be similar to those in premenopausal or perimenopausal people with ER-positive invasive breast cancer, but agreed more evidence was needed to understand this and inform discussions around treatment options for people with male reproductive organs. They made adverse events a primary outcome for the recommendation for research to highlight this.

## How the recommendations might affect practice

The recommendations should encourage standardisation of practice across the UK. Both tamoxifen alone and TFS in combination with AIT are associated with adverse effects that can have cost and quality of life impacts, and because of the different mechanism of action, the side effect profiles will be different and therefore differences in the resources needed to manage these effects may arise. However, very few people are expected to receive TFS in combination with AIT because the population of people with male reproductive organs and breast cancer is very small. This should mean that the resource impact from using TFS in combination with AIT and of testing bone mineral density is also small.

[Return to recommendations](#)

## Extended endocrine therapy

[Recommendations 1.11.13 to 1.11.16](#)

### Why the committee made the recommendations

Good evidence showed that switching to an aromatase inhibitor after 5 years of tamoxifen improved disease-free survival compared with postmenopausal women who had only received tamoxifen for 5 years, with the benefits being greater in those women who had a greater risk of disease recurrence.

The evidence showed no benefit in terms of disease-free survival or overall survival from continuing tamoxifen beyond 5 years. However, some of the studies on tamoxifen were conducted in the 1980s and may not be relevant to current practice. In the committee's experience, continuing tamoxifen can be beneficial for some women.

However, evidence showed that being on endocrine therapy for more than 5 years can increase the risk of problems such as endometrial cancer, osteoporosis, toxicity and phlebitis. The committee agreed that people will often prioritise survival even if this means they will have a reduced quality of life, but that people need to be informed about the possible benefits and risks so they can make a choice.

Because of the risk of problems with taking endocrine therapy for more than 5 years, the committee agreed that healthcare professionals should discuss the potential benefits and risks with women to help them make an informed choice about treatment, based on their own risk factors.

### How the recommendations might affect practice

Some centres already review treatment at 5 years and continue endocrine therapy with tamoxifen or an aromatase inhibitor when it could benefit women. Because a large number of women will be affected by these recommendations, the resource impact will be large for centres that are not currently providing treatment after 5 years.

[Return to recommendations](#)

## Endocrine therapy for ductal carcinoma in situ

Recommendations 1.11.17 to 1.11.19

### Why the committee made the recommendations

There was good evidence that tamoxifen after breast-conserving surgery for ER-positive DCIS improved disease-free survival and reduced rates of local recurrence in women who did not have radiotherapy. Because of their concerns about over-treatment, the committee agreed that women who were at higher risk (those who should have had radiotherapy, but who did not receive it) would benefit more. There was no evidence available for aromatase inhibitors; however, the committee agreed they would likely produce similar improvements in disease-free survival and reductions in local recurrence as tamoxifen. Therefore, the committee recommended endocrine therapy, rather than specifically tamoxifen.

The committee agreed that the benefits and risks of endocrine therapy should be discussed with the woman because of the potential treatment-related complications, such as menopausal symptoms, and the impact on family planning.

### How the recommendations might affect practice

Offering endocrine therapy after initial treatment of DCIS will be a change of practice because it is not currently routinely offered to these women. However, because of the small number of people with DCIS who will not receive radiotherapy, and the low cost of the medicines, the committee agreed that the impact will not be significant.

[Return to recommendations](#)

## Adjuvant bisphosphonate therapy

Recommendations 1.12.1 to 1.12.3

### Why the committee made the recommendations

There was good evidence that treatment with sodium clodronate and zoledronic acid improved disease-free and overall survival in postmenopausal women with node-positive invasive breast cancer.

There was little evidence of benefit for other bisphosphonates. The committee recommended considering zoledronic acid or sodium clodronate treatment for other high-risk populations (such as postmenopausal women with node-negative invasive breast cancer and a high risk of recurrence), based on the evidence that sodium clodronate has overall survival benefits in mixed populations.

Although there is evidence that intravenous (IV) bisphosphonates have a higher risk of osteonecrosis of the jaw, oral bisphosphonates have a higher risk of gastrointestinal problems. There is also a risk of atypical femoral fractures and osteonecrosis of the external auditory canal with bisphosphonates. Because each drug and regimen has different risks, the potential benefits and risks should be discussed with women to help them make an informed choice.

There was little evidence on survival, particularly for premenopausal women on ovarian suppression, those with node-positive or node-negative disease, and those with positive or negative oestrogen or progestogen statuses. There was not enough evidence to make a recommendation relating to the use of adjuvant bisphosphonates in premenopausal women. The committee agreed that further research is needed to determine the long-term survival benefits and the groups of people most likely to benefit from adjuvant bisphosphonates.

The committee did not look at the evidence relating to the use of bisphosphonates for bone health or for the use of baseline dual-energy X-ray absorptiometry (DEXA) scanning, so did not make any new recommendations.

## **How the recommendations might affect practice**

Bisphosphonates are not consistently offered as adjuvant treatment, so this recommendation may lead to an increase in prescribing.

GPs may need to monitor people taking oral bisphosphonates, but this is likely to be an annual review so would not have a large workload impact. However, people may make more GP visits if they have side effects from bisphosphonate treatment.

The committee agreed that IV bisphosphonates would usually be administered at the same time as chemotherapy drugs for the first 6 months of treatment, so this would not result in extra hospital visits for this period. After that, extra visits for administration and monitoring may be needed.

[Return to recommendations](#)

## Radiotherapy techniques

[Recommendations 1.13.1 and 1.13.2](#)

### Why the committee made the recommendations

There was good evidence that radiotherapy to the internal mammary nodes reduced locoregional recurrence and improved survival. However, the committee took into account the potential for lung and heart toxicity, so recommended using a radiotherapy technique that minimises this risk.

There was evidence that deep inspiratory breath-hold radiotherapy techniques reduce the mean radiotherapy heart dose for adults with left-sided invasive breast cancer receiving whole-breast radiotherapy. The committee did not identify any harms. There was also evidence that deep inspiration breath-hold radiotherapy techniques did not reduce the target coverage of whole-breast radiotherapy.

There was no evidence about the use of deep inspiration breath-hold radiotherapy techniques for people with right-sided breast cancer, so the committee did not make separate recommendations for this subgroup.

### How the recommendations might affect practice

Using a radiotherapy technique that minimises the dose to the lung and heart is likely to need a change in practice for many centres. There will be some impact on resources in order to implement this recommendation because additional training will be needed, and local protocols will need developing. However, the long-term impact on resources will be minimal: some additional planning time will be needed but there is no impact on the length or number of radiotherapy sessions.

Currently, deep inspiratory breath-hold radiotherapy techniques are not routinely offered to people with invasive breast cancer having whole-breast radiotherapy. However, the committee noted that the Royal College of Radiologists has produced consensus statements that advise using this technique, and that many centres already offer it. The recommendation will ensure consistent practice and ensure that people can access the

best care.

[Return to recommendations](#)

## Radiotherapy after breast-conserving surgery

[Recommendations 1.13.3 to 1.13.8](#)

### Why the committee made the recommendations

There is evidence that whole-breast radiotherapy after breast-conserving surgery reduces the risk of recurrence and increases overall survival. It also decreases rates of depression and anxiety.

However, because the risk of breast cancer recurring at 5 years is very low and there are harms associated with radiotherapy, the benefits of radiotherapy for women with a very low risk of recurrence are less certain. For these women, the committee agreed that healthcare professionals should fully discuss the benefits and risks with women before a decision is made.

Good evidence showed that partial-breast radiotherapy led to similar results to whole-breast radiotherapy after breast-conserving surgery in women with a low risk of local recurrence. In addition, it may have fewer treatment-related adverse effects. There was evidence for multicatheter interstitial brachytherapy, but this was not recommended because it is not currently available in England.

### How the recommendations might affect practice

Most women are already offered radiotherapy after breast-conserving surgery so this reflects current practice, but more time may be needed to discuss the balance of benefits and risks with women.

The committee was aware that current practice for external beam partial-breast radiotherapy after breast-conserving surgery is based on the Royal College of Radiologists' 2016 consensus statement, so there would be no change to recommended practice.

[Return to recommendations](#)

## Radiotherapy after mastectomy

[Recommendations 1.13.10 to 1.13.12](#)

### Why the committee made the recommendations

The committee agreed that adjuvant postmastectomy radiotherapy should be offered to people who have macroscopically node-positive invasive breast cancer or have involved resection margins. This is because the evidence showed a beneficial effect on survival and local recurrence. Although the evidence was limited and the committee acknowledged that radiotherapy is associated with lung and cardiac morbidity, they concluded that for this group of women, the benefits of radiotherapy outweigh the harms.

There was evidence of a beneficial effect of postmastectomy radiotherapy on local recurrence and overall survival for people with node-negative invasive breast cancer. However, the committee agreed that there was a risk of over-treatment if all people with node-negative invasive breast cancer received postmastectomy radiotherapy. Therefore, the committee recommended that adjuvant postmastectomy radiotherapy should be considered for people with node-negative T3 or T4 invasive breast cancer. There was no evidence for this specific subgroup, but they would be considered at increased risk of recurrence and mortality relative to smaller, node-negative invasive breast cancers because of the size of the tumour.

The committee agreed that radiotherapy after mastectomy should not be offered to women with early invasive breast cancer who are at low risk of local recurrence (for example, most women who are lymph node-negative) because the evidence showed limited benefit in survival and local recurrence.

### How the recommendations might affect practice

The committee agreed that the recommendations will reinforce current practice, so there would be little change in practice.

[Return to recommendations](#)

# Dose fractionation of external beam radiotherapy

Recommendations 1.13.13 to 1.13.16

## Why the committee made the recommendations

The committee noted that most centres use regimens of either 40 Gy in 15 fractions or 26 Gy in 5 fractions. However, there was variation between centres in which external beam hypofractionation regimen they used.

The evidence compared a number of different external beam hypofractionation regimens, but the committee focused on the evidence from 2 randomised controlled trials (RCTs) that compared clinical effectiveness and safety, and a cost-effectiveness analysis, of the 2 hypofractionation regimens that are established in current practice (40 Gy in 15 fractions over 3 weeks and 26 Gy in 5 fractions over 1 week). High-quality to very low-quality evidence showed that the effects of both external beam hypofractionation regimens were comparable, with no clinically important differences between treatment arms for all-cause mortality, breast cancer-related mortality or disease recurrence. Economic evidence showed the 26 Gy in 5 fractions as an effective use of NHS resources compared with 40 Gy in 15 fractions and supported its use in current practice. In addition, the committee noted that in their experience, most people preferred to attend radiotherapy appointments over the course of 1 week rather than over 3 weeks for practical reasons related to fewer trips to the hospital (for example, reduced travelling time and costs, less time off work or from caring responsibilities). The committee recognised how the COVID-19 pandemic had also impacted current practice and had accelerated the change to implement the shorter 26 Gy in 5 fractions regimen.

The evidence showed that there was a higher incidence of outcomes related to clinician-assessed adverse events at 5 years and quality-of-life measurements (related to harder or firmer breasts) for people who were given 26 Gy in 5 fractions compared with 40 Gy in 15 fractions. However, with the exception of a quality-of-life outcome related to swollen breasts, the differences in effect between the 2 regimens were not clinically significant. The committee agreed that in their experience, 26 Gy in 5 fractions is widely accepted by people, despite the small risk of increased adverse events. After taking into account the benefits of a shorter regimen and the impact of the adverse events, the committee recommended the use of 26 Gy in 5 fractions for people having partial-breast, whole-breast or chest-wall radiotherapy, without nodal irradiation, after breast-conserving surgery or mastectomy.

The committee noted that the evidence presented was from populations who were receiving whole-breast radiotherapy. There was no evidence for people who are at lower risk of disease recurrence than those included in the evidence base and who are offered partial-breast radiotherapy because of their reduced risk. However, the committee agreed that, considering the already lower risk for this population, the findings of 26 Gy in 5 fractions in the higher-risk population could be extrapolated to also cover the lower-risk population. The committee also noted that the decision over whether someone has partial-breast or whole-breast radiotherapy can change based on clinical judgement and assessment of the treatment area. As such, the committee agreed that if partial-breast radiotherapy were excluded, the recommendations would not be in line with current practice and may disadvantage a large group of people.

The committee recognised that there may be circumstances when 40 Gy in 15 fractions would be more suitable than 26 Gy in 5 fractions. For example, the committee noted that, in their clinical experience, some groups of people, such as those with a high body mass index (BMI) or fibromyalgia, may experience a greater number of acute adverse events from the 5-fraction regimen (for example, skin reactions, breast oedema or pain). Therefore, some people may prefer the 15-fraction regimen. The committee also noted that the number of people in the studies who had undergone breast reconstruction surgery was small, and it was difficult to determine the most effective hypofractionation regimen for this group. The 15-fraction regimen may also be used for those whose dosimetry is outside that used in the [FAST-Forward trial](#). The committee highlighted the importance of shared decision making for these groups and ensuring that people are aware of the benefits and risks of each treatment option. As such, the committee made a recommendation that 40 Gy in 15 fractions over 3 weeks should be considered for some groups of people, and that its use should be agreed between the person and their care team.

The committee discussed the eligibility criteria for some of the trials in the evidence and noted that people who received nodal radiotherapy were excluded from the main study populations. They highlighted that there are particular concerns around adverse effects such as lymphoedema for people who received regional lymph node irradiation. The committee acknowledged that future trials and the FAST-Forward nodal sub-study results may address some of these concerns, but until further evidence is available the 40 Gy in 15 fractions regimen should continue to be used for this group.

There was limited evidence comparing the 2 hypofractionation regimens in people having breast reconstruction or having regional lymph node irradiation. As such, the committee

developed [recommendations for research on people having breast reconstruction \(including autologous breast reconstruction, but particularly implant-based reconstruction\)](#) and [people having regional lymph node irradiation](#). These should provide clinicians with an increased understanding of how effective the 26 Gy in 5 fractions regimen is for these groups in future.

## How the recommendations might affect practice

The recommendations may reduce variation in practice, with most people being offered 26 Gy in 5 fractions rather than 40 Gy in 15 fractions. This is already current practice in many centres and will not have a major impact for those centres. In those centres where 26 Gy in 5 fractions is not yet current practice, there will be significant cost savings and capacity will be released for more appointments. For places where 40 Gy in 15 fractions is used more routinely, these recommendations may increase the number of people who are offered 26 Gy over 5 fractions. This will reduce the treatment duration and the costs associated with treatment.

[Return to recommendations](#)

## Radiotherapy to nodal areas

[Recommendation 1.13.23](#)

### Why the committee made the recommendation

There was good evidence that radiotherapy to the internal mammary nodes reduced locoregional recurrence and improved survival. However, the committee took into account the potential for lung and heart toxicity, and agreed the importance of using a radiotherapy technique that minimises this risk.

### How the recommendation might affect practice

This recommendation is likely to need a change in practice for many centres. There will be some impact on resources in order to implement this recommendation because additional training will be needed, and local protocols will need developing. However, the long-term impact on resources will be minimal: some additional planning time will be needed but there is no impact on the length or number of radiotherapy sessions.

[Return to recommendation](#)

## Radiotherapy after neoadjuvant chemotherapy

[Recommendations 1.13.25 to 1.13.29](#)

### Why the committee made the recommendations

There was not enough evidence to recommend subgroups of women in whom postmastectomy radiotherapy could be safely omitted after neoadjuvant chemotherapy. Therefore, the committee agreed that the recommendations for postmastectomy radiotherapy among people who have not received neoadjuvant chemotherapy applied to this population.

People with node-negative T4 cancer were not included in this review because they are covered by the recommendation from the previous guideline which has been retained.

Women who respond well to neoadjuvant chemotherapy may derive less benefit from radiotherapy, but the committee agreed that further research was required to determine if the risks of radiotherapy outweighed the benefits in some women. So, they made a [recommendation for research on the indications for postmastectomy radiotherapy after neoadjuvant chemotherapy](#).

### How the recommendations might affect practice

The committee noted that decisions about postmastectomy radiotherapy after neoadjuvant chemotherapy are currently based on pretreatment investigations, so there will be no change to practice.

[Return to recommendations](#)

## Lymphoedema: early identification and risk reduction

[Recommendations 1.14.1 to 1.14.5](#)

## Why the committee made the recommendations

While the quality of the evidence on patient education varied, the committee agreed that people at risk of breast-cancer-related lymphoedema should be actively involved in measures aimed at early identification of the condition. They also agreed educating people about their risk of lymphoedema is very important, as it allows them to be prepared and take steps to reduce their risk (for example maintaining a healthy body weight, being aware of ways to reduce their risk of infection, and following advice on skincare and physical activity, covering both movement and exercise of the limb).

The committee also suggested that skin care advice such as using an appropriate emollient or moisturiser, using sunscreen to prevent sunburn, and other similar good practice, should be included. Such practices help maintain skin integrity, reduce infection risks, and promote overall skin health which can help with managing and reducing the risk of lymphoedema. Giving people information on these topics, including information to take away so they can review it in their own time and refer back to later, was therefore recommended. The widespread use of skincare in lymphoedema management was supported by the committee's expert opinion and experience. Although there was no new evidence on skincare, it was included as a low-risk intervention with potential benefits as part of comprehensive care recommendations for breast-cancer-related lymphoedema.

The committee considered the process of lymphoedema detection, monitoring, and referral to specialist services. There was some evidence that early intervention for lymphoedema leads to better outcomes and quality of life, but the committee agreed regular hospital monitoring where baseline measurements for people can be recorded, and any early changes can be identified would be difficult to implement in practice. The committee wanted to emphasise self-monitoring as a crucial component of lymphoedema prevention, as this approach aims to empower people to be actively involved in their care. They therefore recommended that the information people are given should include advice on how to self-monitor and to detect changes in their condition early on, information to increase awareness of early signs and symptoms of lymphoedema and advice on how to collect baseline measurements for variables such as limb volume.

The committee discussed that self-monitoring should include awareness of skin changes such as changes in colour or the appearance of rashes. Signs and symptoms to be aware of include signs or sensations of swelling, or signs of infection.

Although the evidence was limited and of mixed quality, the committee concluded that

there was no consistent evidence of increased risk of lymphoedema associated with various activities of daily life, or medical procedures on the treated side. They agreed it is important to address people's concerns and offer reassurance about their level of risk. The committee wanted to emphasise the importance of making a shared decision, ensuring that people are fully informed and involved in choosing the best risk reducing options for themselves.

The committee also noted that, in their experience, some people may have concerns about physical activity. However, they agreed that, based on the evidence and their experience and expertise, physical activity (including upper limb exercise) does not worsen or cause lymphoedema. The committee agreed that clarifying that physical activity is safe and potentially beneficial was important to address common patient concerns and encourage healthy lifestyle behaviours.

The committee found that the evidence on using compression therapy as a preventive strategy for breast-cancer-related lymphoedema is currently insufficient. The effectiveness appeared to vary depending on the type of compression used (for example, compression sleeves) and the comparator (for example, education, light compression sleeves). Additionally, the studies reviewed did not report on patient adherence to wearing compression garments, which is a key factor in determining their practical usefulness. The committee noted that people needed to wear compression garments daily for a long period of time in the studies, which may be uncomfortable and undesirable for many people. Given this inconsistency in the evidence and patient experience, the committee decided not to recommend compression therapy for lymphoedema risk reduction.

There was some evidence on surgical interventions for preventing lymphoedema, for example lymphovenous anastomosis (LVA) and vascularised lymph node transfer (VLNT). While some studies suggest potential benefits of immediate LVA during axillary lymph node dissection (ALND) in reducing excess limb volume, cellulitis occurrence, need for conservative therapy, and improving quality of life and physical function, the committee agreed that more research is needed before preventive surgical interventions are suitable for all at-risk patients. However, a link to existing NICE interventional procedures guidance on LVA was added for information.

As VLNT is not covered by the existing NICE interventional procedures guidance, but the committee are aware of its use preventatively as well as for treatment of established lymphoedema, the committee made a recommendation for research on VLNT.

The committee recognised that, while breast cancer predominantly affects women, men can also be affected. Additionally, while clinical trials do not tend to include men in studies, the committee felt that it was appropriate to extrapolate the evidence where possible to make comprehensive recommendations that address the needs of all breast cancer patients, regardless of gender.

The committee considered the difficulty of self-monitoring for people with a learning disability or dementia, they noted that [NICE's information on making decisions about your care](#) would help as a resource to support people with learning disabilities or dementia. The committee also discussed issues with identifying skin changes on darker skin. They did not have enough evidence to make a recommendation on this, but were aware that local services often already had resources (such as visual aids) in place to help with this.

## How the recommendations might affect practice

It is expected that more lymphoedema education will result in better outcomes. There should be no change in resource needs as the recommendations reflect current clinical practice. However, the addition of education on self-monitoring and baseline measures may mean more resources are needed in order to teach people or provide material to support these recommendations.

[Return to recommendations](#)

# Lymphoedema management

[Recommendations 1.14.7 to 1.14.11](#)

## Why the committee made the recommendations

There was mixed evidence on a variety of interventions for managing lymphoedema. Overall, the evidence was at moderate to high risk of bias, and the studies included small participant numbers with varying lymphoedema severity, interventions and outcomes. However, the committee agreed that in the first instance, people with breast-cancer-related lymphoedema of the arm, hand or chest wall should be referred by healthcare professionals who have contact with them to a lymphoedema service that will evaluate their lymphoedema and discuss management options. They should also be provided with information on lymphoedema and its complications. The committee emphasised the

importance of an assessment being done before any treatment is considered. The committee also wanted to highlight the urgency of timely referral, despite the variability in lymphoedema specialist service availability across the UK. The evidence on complete decongestive therapy and its individual components (including physical activity, manual lymphatic drainage, bandaging, compression garments, skin and nailcare) varied. Most of the evidence for compression therapy (including bandages, garments and devices) and exercise showed an improvement in the outcomes of lymphoedema severity, adverse events, and quality of life. These outcomes are important from a clinical perspective as well as from the patient's perspective for deciding on treatment options.

The committee were convinced by evidence supporting the efficacy of compression therapy, so recommended its use. However, they also acknowledged that compression therapy may not always be appropriate, for example in people who experience significant discomfort, or in cases where the affected area is difficult to compress effectively using standard garments. In these specific cases kinesiology tape may be an option. There was some evidence on kinesiology tape for the management of lymphoedema that showed improvement in patient quality of life, pain and discomfort levels, although the effectiveness of this treatment varied when compared to similar interventions such as compression garments. The committee noted that people may prefer kinesiology tape because of its convenience, ease of application and comfort. However, they noted that it may not be as effective as compression garments and so could have differing results depending on the area of oedema.

The committee discussed that, while some people may prefer kinesiology tape, this option usually needed people to purchase their own tape. The committee were concerned that this additional cost could create a barrier to access, particularly for individuals from lower socioeconomic backgrounds. This disparity in access could potentially exacerbate existing inequalities. To that effect, the committee only suggested kinesiology tape as an option that people may wish to try.

The clinical evidence for manual lymphatic drainage (MLD) was uncertain and there was no economic evidence. The committee acknowledged that MLD is labour intensive and is often carried out by specialist lymphoedema practitioners for several sessions and, therefore, could bear a significant cost for the NHS. Given the lack of strong evidence and the potential cost for the NHS, the committee decided not to make any recommendation on MLD.

The committee also noted that in their experience some people may have some concerns

about physical activity, but they agreed that based on the evidence and their experience, physical activity (including upper limb exercise), will not impact people's lymphoedema and may improve some clinical outcomes.

Along with conservative management options for lymphoedema, there was some evidence on surgical interventions for managing lymphoedema. Lymphovenous anastomosis (LVA) and vascularised lymph node transfer (VLNT) were discussed. These techniques are already used in some countries, and some UK centres are adopting them. Although there was low-quality evidence that LVA reduced severity of lymphoedema, overall, the evidence did not show significant effects on efficacy, safety, and overall quality of life outcomes compared to other treatments. The committee highlighted that surgery for lower limb lymphoedema is well studied, but there is a significant evidence gap for truncal and upper limb lymphoedema which are more relevant to breast cancer patients. They were also concerned that the full costs associated with the surgery are not well understood, and there is limited evidence available to carry out economic modelling. Considering these limitations, the [committee made recommendations for research on lymphoedema core outcomes set to address these issues](#). However, based on their experience, the committee thought that some people may benefit from surgical management, and that this could form part of the shared decision-making discussion when choosing management options.

The committee discussed that the lymphoedema surgery services are not fully established and varied across the UK. As a result, there were concerns about the limited availability of lymphoedema surgery services, which could lead to health inequalities. They agreed recommendations for research are more appropriate to address knowledge gaps, so made a [recommendation for research on surgical interventions including lymphovenous anastomosis as well as vascularised lymph node transfer](#). Despite these limitations, it was acknowledged that there may be some cases where surgical management may be of some benefit and agreed that this can form part of the shared decision-making discussion when choosing management options after referral to a lymphoedema specialist service.

## How the recommendations might affect practice

The recommendations may reduce variation in practice in terms of which interventions people are offered and the information given. As such, these recommendations highlight some interventions that may be effective, but also more comfortable and convenient for people. This might reduce any costs, improve adherence, and improve outcomes for people with breast cancer-related lymphoedema.

[Return to recommendations](#)

## Arm and shoulder mobility

[Recommendations 1.14.12 to 1.14.19](#)

### Why the committee made the recommendations

The committee noted there was very little high-quality evidence for any of the outcomes, and most of the evidence was low to very low quality. The committee agreed that they did not feel confident in making recommendations based on low-quality evidence from mainly single studies. Therefore, they used their clinical knowledge and experience alongside high-quality evidence from 1 UK-based RCT to support their decision making. This evidence showed improved outcomes with a physiotherapy-led structured supervised exercise programme in addition to usual care for reduction of pain, quality-of-life improvement and adherence to arm and shoulder exercises in people with a higher risk of developing shoulder problems. The trial provided all participants with information leaflets about exercises to help with arm and shoulder mobility after breast cancer surgery. This reflects standard practice in the UK, and the committee agreed it was important to reflect this advice in the recommendations. The recommendations also highlight that instructions on upper limb exercises and information should be discussed, explained and clarified with the person before radiotherapy begins, as the exercises should have been well established before starting treatment. The committee recommended that this should also happen before surgery.

The committee were aware that instructions on upper limb exercises are not always given out by someone who is a specialist in physiotherapy (for example, breast care nurses), so they also recommended that breast care units have documented local guidelines in place that include details about who and how to deliver this information effectively. They thought it was important that the information included details on when the exercises should be started. For most people, this will be the day after surgery, but it may be later for others, such as those who have certain surgical procedures (for example, free flap reconstruction or implant reconstruction) where exercising the day after surgery could interfere with their recovery. Exercises should be tailored to each person based on their needs (for example, comorbidities and side effects of cancer treatment), but for the majority of patients, a standard programme of upper limb exercises will be suitable. The committee also agreed it was important that instructions on upper limb exercises should be available in other formats to be accessible to people with different needs (for example,

video or large print and various languages). There are already [recommendations on communication in the NICE guideline on patient experience in adult NHS services](#), so a link to this was included as part of the recommendation.

Based on the effectiveness of the intervention in the UK-based trial, the committee agreed that people who met the same criteria as those included in the trial should be identified as being at higher risk of developing shoulder problems. These people should then be offered supervised support to apply the exercises. The baseline shoulder identification of someone as high risk of developing shoulder problems could be done by a member of the clinical team (for example, a clinical nurse specialist) and could be done by looking at a person's medical history and asking the person if they have experienced any of the issues listed in the recommendation (for example, asking if they have stiffness of their shoulder or if the function of their shoulder is reduced). The evidence did not specify that these risk factors were only relevant to the affected side and the committee noted that people should be considered at high risk if they have any of the pre-existing shoulder conditions in the contralateral side. It was also highlighted that for most people radiotherapy to the axilla or supraclavicular nodes is decided before surgery. However, for some people this may be decided after postoperative pathology review. For this reason, they recommended that people who are identified as needing radiotherapy to the axilla or supraclavicular nodes after surgery should also be considered as being at higher risk of developing shoulder problems. This ensures that people would not miss out from supervised support if the need for radiotherapy was not identified before surgery.

The committee also agreed that, in their experience, other people having surgery for breast cancer who did not meet the high-risk criteria in the recommendations could benefit from supervised support. This includes, for example, people with learning or sensory disabilities, which could adversely affect their ability to carry out exercises without supervision and make them more likely to develop shoulder problems as a result. It also includes people having breast cancer surgery who have side effects from additional cancer treatments or who have other commonly performed adjunct surgeries in addition to breast cancer surgery, as well as people who are having radiotherapy without surgery.

Based on their experience, the committee recommended that supervised support should be delivered by a physiotherapy staff member or other appropriately trained allied health professional (for example, an occupational therapist). This should include checking the performance of the exercises and correcting them as needed. The committee agreed that people may not feel confident in translating written exercise instructions into physical movement, so would benefit from having advice on whether they are doing them correctly.

This support also allows people who might be experiencing difficulties with both the exercises and with shoulder function to be identified early after radiotherapy or surgery. It will also ensure that people are able to receive the full benefit from the exercises, and may increase adherence if someone is confident they are doing the exercises correctly.

The committee also agreed supervised exercises and physiotherapy support should be available in different formats (for example, virtual or group sessions), and be tailored to individual circumstances and needs (for example, mental health and learning needs) to help with adherence. There was no evidence about interventions delivered virtually, but the committee agreed to recommend this option as it may help to reduce health inequalities and address access options for people where other interventions are not locally available. The committee were aware that some people may not be able to access virtual services for a range of reasons, such as a lack of access to suitable devices, living in areas of poor connectivity and difficulties with using the technology. However, including virtual services in the recommendations should not provide barriers to these people accessing support, as they can be given the option of face-to-face sessions. The committee also highlighted that face-to-face physiotherapy may be more beneficial for people with complex needs or those at higher risk (for example, people from minority ethnic family backgrounds, people with disabilities, neurodiverse people, those who experience physical difficulties with recovery or rehabilitation) because they might need specific instructions and feedback.

The committee were mindful that, while their experience shows that virtual interventions are beneficial, there is a lack of evidence for this and that there was no evidence on whether the format of the intervention (individual, group, virtual, and face to face) impacted adherence or satisfaction. Therefore, the committee took this into account when making recommendations for research on strategies to reduce arm and shoulder problems, to cover this gap in the evidence.

There was limited, low-quality evidence on long-term outcomes and no evidence on outcomes for different population subgroups, such as people from minority ethnic family backgrounds, disabled people and neurodiverse people. The committee also noted that lower-quality evidence comparing interventions was not conclusive. The committee discussed the importance of understanding the most effective and cost-effective way of delivering the intervention (for example, type of physiotherapy or exercise, mode of delivery, number of sessions) and the acceptability of such intervention for different populations, and made a recommendation for research on the most effective and cost-effective way of delivering the intervention to address this gap in the evidence.

The committee also recommended that people should be referred to the physiotherapy department if they report a persistent reduction in arm and shoulder mobility after breast cancer treatment. This allows people to continue to seek support if it is needed. The committee noted that the [recommendation for research into adherence to, and satisfaction with, different intervention formats](#) will gather evidence about the long-term effects of strategies to reduce arm and shoulder problems, and this may reduce the number of people who have to be referred to the physiotherapy department in future.

## How the recommendations might affect practice

There may be an increase in the number of people having supervised exercise or physiotherapy support after breast cancer surgery or before radiotherapy. However, if this could be delivered virtually (individual or group), it is likely to have a lower impact on NHS resources than in-person 1-to-1 sessions and could free up resources for face-to-face interventions for those for whom virtual services are not appropriate or if there are barriers to them accessing virtual services.

[Return to recommendations](#)

## Lifestyle

[Recommendations 1.16.1 and 1.16.2](#)

### Why the committee made the recommendations

There was evidence that both dietary changes (reducing fat intake and maintaining a healthy weight) and physical activity increase survival in people with invasive breast cancer.

There was some evidence that cancer recurrence is more likely in people who drink more than 3 or 4 alcoholic drinks per week or 6 g of alcohol per day. This equates to approximately 5 units of alcohol per week.

There was no evidence that smoking cessation reduces recurrence of breast cancer, although the view of the committee was that smoking cessation should always be recommended to people with breast cancer.

## How the recommendations might affect practice

The committee discussed that many NHS services would already be advising people with breast cancer about the importance of a healthy lifestyle, and how they can make lifestyle changes to reduce the risk of recurrence. The committee agreed that these recommendations will help to direct conversations towards effective lifestyle changes. There will be no impact on resources because these discussions were already happening, and most of the lifestyle changes will be 'self-care' and implemented by patients themselves.

[Return to recommendations](#)

## Context

This guideline updates and replaces the NICE guideline on early and locally advanced breast cancer (CG80). This is because new evidence was identified in surveillance that could affect recommendations, and has already changed clinical practice in some locations.

People with symptoms that could be caused by breast cancer are referred by their GP to designated breast clinics in local hospitals (see [NICE's guideline on suspected cancer: recognition and referral](#)). In addition, eligible women are invited for screening through the NHS Breast Screening Programme (NHSBSP) in England or the Breast Test Wales Screening Programme (BTWSP) in Wales. For most people, whether they are referred following breast screening or after presentation to a GP, diagnosis in the breast clinic is made by triple assessment (clinical assessment, mammography and/or ultrasound imaging, and core biopsy and/or fine-needle aspiration cytology). It is best practice to carry out these assessments at the same visit (see [NICE's cancer service guideline on improving outcomes in breast cancer](#)).

Breast cancer is the most common cancer in the UK, with approximately 54,000 new cases of invasive disease and around 7,000 new cases of pre-invasive (in situ) disease diagnosed annually. Most of the breast cancers occur in women, but just over 300 men in the UK are also diagnosed with invasive breast cancer every year.

Most breast cancers are diagnosed at an early stage and are therefore potentially curable with modern treatments. Survival rates have improved over recent decades with almost 90% of women diagnosed with breast cancer surviving their disease for 5 or more years after diagnosis. Survival is, however, linked to the stage of the disease at diagnosis; only 15% of women diagnosed with stage 4 disease are alive at 5 years. Breast cancer remains the leading cause of death in women aged 35 to 49 years and is second only to lung cancer as the leading cause of cancer death in all women.

The main risk factor for breast cancer is being female; the disease is 100 times less common in men. It is also a disease of ageing, with the risk of breast cancer increasing with increasing age. Some breast cancers are linked to lifestyle factors that include obesity, alcohol intake and use of hormone replacement therapy, whereas other lifestyle factors, including physical activity and breastfeeding, protect against breast cancer. About 5% of breast cancers are because of inherited mutations in high-risk genes such as

BRCA1/2 and p53.

## Groups that are covered

Adults (18 and over) with:

- newly diagnosed invasive adenocarcinoma of the breast of any size (T1 to T4), with or without spread to locoregional lymph nodes (N0 to N3) and with no distant metastases (M0)
- newly diagnosed ductal carcinoma in situ (DCIS)
- Paget's disease of the breast.

## Groups that are not covered

Adults (18 and over) with:

- invasive adenocarcinoma of the breast and distant metastases (clinical or pathological M1)
- rare breast tumours (for example, angiosarcoma or lymphoma)
- benign breast tumours (for example, fibroadenoma)
- phyllodes tumour
- locally recurrent breast cancer or DCIS
- lobular carcinoma in situ (LCIS)
- no personal history of breast cancer and an increased risk of breast cancer due to family history.

## Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the [NICE topic page on breast cancer](#).

For full details of the evidence and the guideline committee's discussions, see the [evidence reviews](#). You can also find information about [how the guideline was developed](#), including [details of the committee](#).

NICE has produced [tools and resources to help you put this guideline into practice](#). For general help and advice on putting our guidelines into practice, see [resources to help you put guidance into practice](#).

## Update information

**April 2025:** We have reviewed the evidence and made new and updated recommendations on neoadjuvant treatment and gonadal function suppression. These recommendations are marked **[2025]**, **[2009, amended 2025]** or **[2018, amended 2025]**.

We also added links to relevant technology appraisal guidance throughout the guideline, and the guideline has been reordered to reflect the sequence of treatment by cancer type. Some recommendations for research that are no longer relevant have also been stood down.

**February 2025:** We have reviewed the evidence and have updated and made new recommendations on early identification and risk reduction of lymphoedema and management of lymphoedema. These recommendations are marked **[2025]**, **[2009, amended 2025]** or **[2018, amended 2025]**.

**January 2024:** We have reviewed the evidence and have updated and made new recommendations on further surgery after breast-conserving surgery. These recommendations are marked **[2024]** or **[2009, amended 2024]**.

**June 2023:** We have reviewed the evidence and made new recommendations and recommendations for research on dose fractionation for external beam radiotherapy. These recommendations are marked **[2023]**.

We have also made some changes without an evidence review:

- We have updated some wording to bring the language and style up to date, without changing the meaning.
- We have updated some recommendations to bring them in line with current terminology and practice.
- We have combined, clarified or reworded some recommendations to make them clearer and to improve ease of reading.

These recommendations are marked **[2018, amended 2023]**.

Recommendations marked **[2009]**, **[2017]**, **[2018]** and **[2009, amended 2018]** last had an

evidence review in 2009, 2017 and 2018, respectively. In some cases, minor changes have been made to the wording to bring the language and style up to date, without changing the meaning.

**April 2023:** We have reviewed the evidence and made new recommendations and recommendations for research on arm and shoulder mobility. These recommendations are marked **[2023]**.

**July 2018:** We have reviewed the evidence and made new recommendations on the diagnosis and treatment of people with early and locally advanced breast cancer. These recommendations are marked **[2018]**.

We have also made some changes without an evidence review. These recommendations are marked **[2009, amended 2018]**.

Recommendations marked **[2009]** last had an evidence review in 2009. In some cases, minor changes have been made to the wording to bring the language and style up to date, without changing the meaning.

### **Minor changes since publication**

**March 2026:** In recommendation 1.1.5, we updated the link to NICE's guideline on fertility problems.

**March 2024:** Evidence review N was amended to add a missing study. The rationales for DCIS in section 1.3 were updated but there were no changes to the recommendations.

**May 2022:** We added a link to NICE's guideline on medicines associated with dependence or withdrawal symptoms in the section on menopausal symptoms.

ISBN: 978-1-4731-6930-2