MINISTRY OF HEALTH
MANATŪ HAUORA

New Zealand Government

Breast Reconstruction

National guidelines for best practice

2021

Released 2021 **health.govt.nz**

Acknowledgements

The British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS) and the international Association of Breast Surgery (ABS) kindly permitted the New Zealand Ministry of Health to adapt the content of *Oncoplastic Breast Reconstruction: Guidelines for Best Practice* (Rainsbury and Willett 2012) to the New Zealand context.

These New Zealand guidelines were developed by the Breast Reconstruction Expert Advisory Group, which was established in 2019. Members of the group hold expertise in the diagnosis, support, treatment and follow-up for patients who are considering, are in the process of undergoing or have had breast reconstruction.

Special thanks go to the following people for their contribution to the Breast Reconstruction Expert Advisory Group; Mr Marcus Bisson, Plastic Surgeon; Dr Susan Brooks, Radiation Oncologist; Ms Alessandra Canal, Plastic Surgeon; Mr Peter Chin, Breast Surgeon; Ms Kathy Davenport, Canterbury DHB; Ms Lou Hayes, Oncoplastic Breast Surgeon; Mr Ralph La Salle, Canterbury and West Coast DHBs; Ms Michelle Locke, Plastic Surgeon; Ms Meredith Simcock, Plastic Surgeon; and Ms Donna Alexander, Breast Nurse.

The guidelines were developed with reference to established national and international guidelines across publicly funded health care systems and relevant evidence-based literature. Key information from the Standards of Service Provision of Breast Cancer Patients in New Zealand, Provisional Standard 8.6 provided the benchmark in drafting these guidelines.

Citation: Ministry of Health. 2021. *Breast Reconstruction: National guidelines for best practice*. Wellington: Ministry of Health.

Published in June 2021 by the Ministry of Health
PO Box 5013, Wellington 6140, New Zealand

ISBN 978-1-99-100727-8 (online)
HP 7728

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This document is available at **health.govt.nz**

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1 Introduction

1.1 Purpose

This document provides guidance on best practice principles, processes and pathways for patient management when providing breast reconstruction surgery following mastectomy surgery. It also covers principles for managing patients who are having prophylactic breast surgery.

The guidelines aim to enhance decision-making processes for multidisciplinary teams (MDTs) that want to develop a patient management plan based on the best breast oncoplastic and reconstructive practices for each stage of a patient's journey. However, ultimately, members of the MDT remain responsible for the treatment of patients under their care. Within an evolving evidence base, these guidelines reflect a combination of peer opinion and the best available evidence at the date of publication. The information contained in this document is provided as suggestions that teams can consider and adapt to suit particular situations – it should not be seen as a set of standards of care that staff must be follow in every instance.

1.2 Background

Many women who have had breast cancer surgery seek publicly funded breast reconstruction surgery. Access to breast reconstruction following a mastectomy is seen as an important quality of care measure for patients with breast cancer (Murphy and El-Tamer 2013). Breast reconstructive surgery can be done at the same time as the mastectomy (immediate) or later (delayed).

The use of immediate or delayed breast reconstruction is important in enhancing body image and confidence after mastectomy. Breast reconstructive surgeons work with the cancer care team to restore the patient's normal body shape and quality of life. Reconstructive surgery is performed by plastic surgeons and specially trained and credentialed general surgeons (oncoplastic surgeons).

Public breast units across New Zealand do not currently follow a consistent process to determine access to breast reconstruction following cancer surgery. Generally, if it is clinically appropriate to perform an 'immediate' reconstruction, then this will be offered. If an immediate reconstruction is not appropriate, or not desired by the patient, then the unit responses vary from accepting almost none to accepting all cases as 'delayed' reconstruction patients. Access then is based on local criteria.

1.3 Rationale

Breast reconstruction after mastectomy is an important way of enhancing body image and confidence. Women who have breast reconstruction report a number of benefits, including, a feeling of being whole again, better psychological and social adjustments to their cancer and mastectomy, more positive body image, better sexual adjustment, less depression and feeling more comfortable without a prosthesis (Elder et al 2005; Markopoulos et al 2009).

Breast reconstruction is not associated with a higher risk of cancer recurrence.

One of the goals of breast surgery is to restore a woman's breast to as normal a state as practical as part of her treatment and in keeping with her wishes. To achieve this, many women require more than one operation to the same breast and/or contralateral breast surgery to attain an appropriate result after reconstruction and sometimes after breast-conserving surgery.

Methods of reconstruction include implant-based techniques, pedicled flaps and free tissue transfers. There are pros and cons to each method that need to be considered with other patient characteristics when deciding which approach is best for each individual. The people informing women about the reconstruction procedures must have a thorough knowledge of the techniques available. Furthermore, well-defined referral pathways must be in place in cases where not all methods can be carried out locally (NZGG 2009).

A large quantity of information about reconstruction and the options available must be discussed with women for them to make informed decisions. This can be difficult for the woman when, at the same time, she is trying to absorb the distressing news of a breast cancer diagnosis.

1.4 Expectations for best practice

The following six points outline the main expectations for best practice in breast reconstruction patient care.

1. Clinicians should discuss the options of delayed or immediate breast reconstruction with all women who are due to undergo mastectomy and offer it breast reconstruction except where significant comorbidity precludes it. All appropriate reconstruction options are offered and discussed with women, irrespective of whether they are all available locally.
2. Where breast reconstructive surgery is not carried out locally or where more complex reconstruction procedures are required, any women identified as requiring specialist input from an oncoplastic breast surgeon or a tertiary plastic

and reconstructive service should be referred through well-defined referral pathways.

3. Discussions about immediate breast reconstruction should include the fact that a complication may occasionally delay adjuvant chemotherapy or radiation therapy. Neoadjuvant chemotherapy may have the advantage of averting such a delay to postoperative chemotherapy.

4. If post-mastectomy radiation therapy is likely, then delayed reconstruction may be considered because radiation therapy might impact on the outcome of immediate breast reconstruction. Women should be made aware of this risk (NZGG 2009).

5. Revisional surgery, implant exchange, capsulectomy, nipple areola reconstruction, contralateral symmetry surgery and delayed reconstruction are all available to women in the public health service, within a reasonable timeframe.

6. Women who have undergone breast conserving surgery and are unhappy with the outcome (including symmetry) should be referred for discussion of reconstruction, revisional or contralateral breast surgery.

2 The patient's pathway

2.1 Referral

There should be a clear and agreed referral pathway for a patient from primary to secondary health care services. Referral of a patient with breast symptoms from a primary health care service is detailed in the *Best Practice Diagnostic Guidelines for Patients Presenting with Breast Symptoms* (Willett et al 2010). Referral of a patient from the breast screening programme is detailed in the *BreastScreen Aotearoa National Policy and Quality Standards* (National Screening Unit 2020).

All information should be collated and provided to the multidisciplinary team (MDT), and once they have met to discuss the case, all decisions about a patient's suitability for reconstruction (Immediate and delayed) should be clearly documented in the patient's notes for consultation.

If the patient is suitable for delayed reconstruction then the surgery should be performed once the patient is suitable for surgery (minimum of six months post radiotherapy), and there should be no maximum time limit for this procedure post mastectomy. All patients should be informed about reconstruction options and their suitability for the procedure, and they should be provided with good-quality information to take away with them and think about. Communication with patients about breast reconstruction is detailed in the NICE guideline *Early and Locally Advanced Breast Cancer: Diagnosis and management* (NICE 2018).

Decisions relating to the oncological and reconstructive aspects of treatment are often complex, and every effort must be made to give patients enough time and support to allow them to consider all feasible options with their operating surgeon and reach a satisfactory decision.

Revisional surgery, implant exchange, capsulectomy, nipple areola reconstruction, contralateral reduction or mastopexy and delayed reconstruction are all available to women in the public health service, within a reasonable timeframe. Women who have undergone breast-conserving surgery and are unhappy with the outcome (including symmetry) should be referred for discussion of reconstruction, revisional or contralateral breast surgery (National Breast Cancer Tumour Standards Working Group 2013, section 8.22).

2.2 The discussion about breast reconstruction

A patient's suitability of breast reconstruction (immediate and delayed) should be discussed with all patients for whom mastectomy is recommended by the MDT.

Where applicable, the following options should also be discussed:

- neoadjuvant therapy to downsize a cancer
- other oncoplastic breast surgery techniques that avoid mastectomy
- the full range of external prostheses available.

Discussion about immediate breast reconstruction should include the fact that a complication may occasionally delay adjuvant chemotherapy or radiation therapy. Neoadjuvant chemotherapy can have the advantage of averting the possibility of a complication in immediate breast reconstruction delaying postoperative chemotherapy (National Breast Cancer Tumour Standards Working Group 2013, section 8.19).

2.3 Offering breast reconstruction

Breast reconstruction (immediate or delayed) should be offered to all suitable patients for whom mastectomy is recommended by the MDT, unless there are significant contraindications (see sections 3.1 and 3.2).

- If breast reconstruction is contraindicated, the reasons for this should be explained to the patient and documented in their records.
- All relevant options should be discussed and with equal weighting, irrespective of whether they are available locally.
- If post-mastectomy radiation therapy is likely, then delayed reconstruction may be considered because radiation therapy might impact on the outcome of immediate breast reconstruction. Patients should be made aware of this risk (NZGG 2009).
- Patients should be provided with locally agreed written information detailing the risks and benefits of different types of breast reconstruction (see also Appendix B).

2.4 The referral pathway

Clear and explicit information and multidisciplinary meeting (MDM) processes and comprehensive referral and treatment pathways will help to optimise patient outcomes.

Referrals should not be accepted unless they are complete and accurate. Every referral should note the patient's smoking status, body mass index (BMI) and chance of future adjuvant treatment. The MDT is an important element in the process to determine a patient's treatment plan. One member of the MDT should take responsibility for patient management – usually this is the oncologic breast surgeon. They may refer the patient on to the reconstructive surgeon with support from the MDT. Section 3.2 outlines the patient factors that should be taken into consideration when assessing reconstruction suitability.

If an immediate breast reconstruction is most appropriate, this means that there are critical timeframes and organising surgical resources within the clinically appropriate faster cancer treatment (FCT) timeframe can often be challenging.

2.5 The referral process for breast reconstruction

A clear framework of patient management and referral should be agreed within and between the responsible members of the MDT and the patient's primary health care practitioners, ensuring all relevant information is available for the MDM and an appropriate patient plan can be decided.

Close teamwork is necessary between and within oncological and reconstructive teams:

- to ensure the patient has access to all reconstructive options
- to facilitate second opinions
- to enable discussion of breast reconstruction surgery within the context of oncological treatments.

Where breast reconstructive surgery is not carried out locally, or where more complex reconstruction procedures are required, any women identified as requiring specialist input from an oncoplastic breast surgeon or a tertiary plastic and reconstructive service should be referred on through well-defined referral pathways (National Breast Cancer

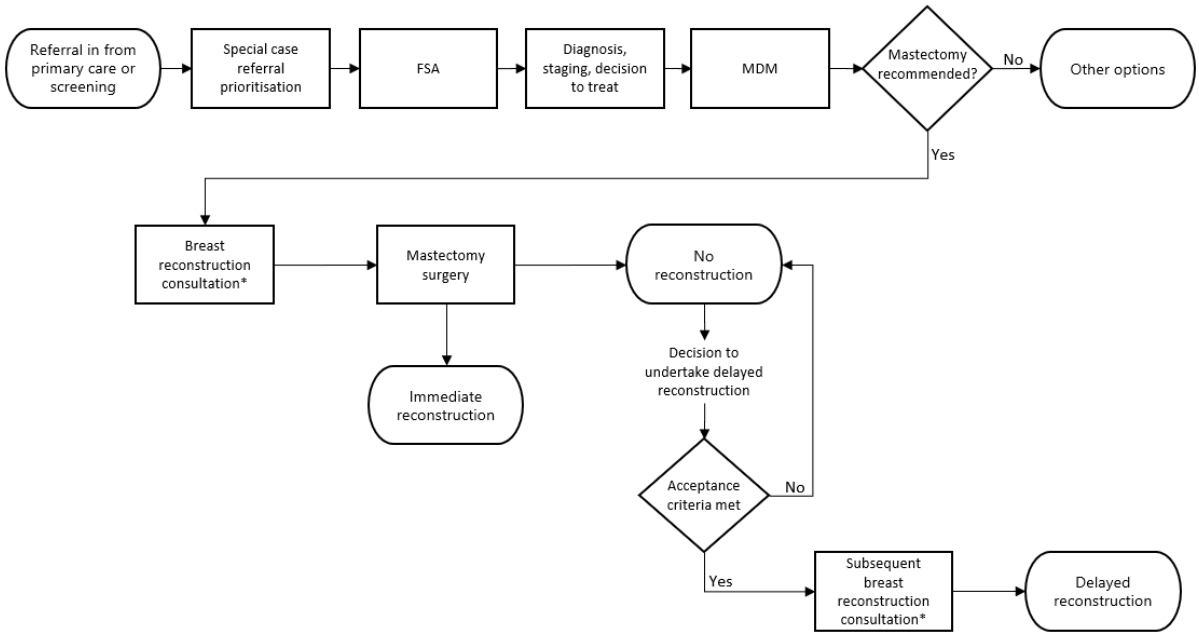
Tumour Standards Working Group 2013, section 8.18). Appropriate information should be made available by the referring team, including:

- documentation of the MDM discussion before the referral
- imaging, cytology, pathology and other relevant reports
- where possible, all images and histopathology slides and/or reports for review
- details of comorbidities and psychological, psychiatric and other relevant medical histories.

Following breast reconstruction surgery, a full discharge summary should be sent back to the referring or treating MDT, including copies of operative notes, histopathology slides and/or reports, and a post-discharge plan. The discharge summary should also be available to the patient and their GP.

A suggested patient pathway is outlined in Figure 1 below.

Figure 1: The pathway to breast reconstruction post mastectomy



2.6 The breast reconstruction consultations*

Breast reconstruction consultation can take place at different times and can take different forms (as noted in Figure 1) in the patient pathway and is shaped by the clinical requirements and patient suitability. The consultation step could involve the patient meeting with a breast surgeon, an oncoplastic surgeon, a plastic surgeon or a combination of any of these three as the amount of information the patient needs increases.

At the minimum, all patients should have breast reconstruction mentioned to them when mastectomy is discussed, regardless of their suitability for an immediate or delayed procedure.

If immediate reconstruction is not recommended, delayed reconstruction should be discussed as a possibility in the future, even if the patient does not meet any current eligibility criteria, so that the patient is fully informed as early as possible.

Women who meet the eligibility criteria for immediate reconstruction should be offered a full discussion of all potential options. However, it may not be appropriate for this discussion to take place when they receive their breast cancer diagnosis. Where possible, this consultation should be held with a plastic surgeon as soon as possible in order to facilitate complete the discussion of all the autologous and alloplastic options.

Given that not all regions in New Zealand have local access to plastic surgery services, an appropriately trained oncoplastic breast surgeon can undertake this consultation. The patient should be told of all options, regardless of whether those options are available locally. If the local breast surgery service is unable to provide this information, the patient should be referred to the regional plastic surgery department for this consultation.

The process of discussing breast reconstruction should be clearly documented in the patient's notes.

2.7 Contralateral prophylactic mastectomy

Some women with unilateral breast cancer may request a contralateral mastectomy either at the time of the initial treatment or at a later date. The reasons for this decision may include: a high risk on the basis of family history; proven increased genetic risk of breast cancer; the patient's perception of increased risk of cancer recurrence and associated anxiety; and body image, symmetry and comfort preferences (Buchanan

et al 2016, Hawley et al 2014). Te Aho o Te Kahu, Cancer Control Agency does not currently have criteria for prophylactic removal of breast tissue.

For some women, contralateral mastectomy may be deemed appropriate upon consultation with their surgeon, and in these cases, they must be fully counselled about the possible added risks and complications.

Note: These guidelines have not been developed to address mastectomy eligibility and are intended to cover only the reconstruction of tissue post cancer treatment. However, it must be recognised that contralateral mastectomy with or without reconstruction (the latter is sometimes referred to colloquially as 'going flat') is a part of some patients' pathways and is usually managed on a case-by-case basis by breast surgeons as resources allow. Prophylactic mastectomy should not be confused with gender affirming mastectomy surgery.

Note also that women who choose to undergo bilateral mastectomy with unilateral cancer may not be eligible for delayed bilateral reconstruction in the public health system.

2.8 Quality criteria

	Quality criteria: patient pathway and referral
1	Breast reconstruction suitability and/or options are discussed with all patients requiring surgery for breast cancer.
2	When a referral for breast reconstructive surgery is made from one MDT to another MDT, full information is made available at the time of the referral and reciprocated following treatment.
3	The oncological and reconstructive management is considered at the MDM. A treatment plan and subsequent modifications are agreed and recorded, including plans for onward referral.

3 Assessment

All patients should be discussed in the MDM and recommendations recorded. Assessment should always be carried out by experienced, appropriate members of the MDT. This will ensure:

- a simultaneous evaluation of all the oncological and reconstructive factors
- review of all appropriate treatment options with consideration of each patient's individual circumstances and preferences
- development of an agreed and documented health care plan
- oncological principles are not compromised and always take precedence.

When delayed breast reconstruction is considered, full clinical assessment and staging should be performed where indicated, and the results should be available to inform decision-making.

The uptake of Immediate breast reconstruction varies around the country, but breast reconstruction surgery should be discussed with, and offered to, all suitable patients.

3.1 Oncological considerations

For immediate breast reconstruction, the likelihood of post-operative adjuvant treatment (especially radiotherapy) should inform decision-making. Discussion should include the influence of adjuvant treatment on breast reconstruction, and vice versa, and should cover the following points.

- Radiotherapy may have a detrimental effect on the reconstructed breast, particularly after implant-based procedures.
- Expanders incorporating metal ports within the radiotherapy field may interfere with radiotherapy dosage.
- Systemic neoadjuvant therapy or delayed breast reconstruction should be considered where there are concerns that immediate breast reconstruction may lead to delays in treatment.
- When performing reconstruction of the partial mastectomy defect, the tumour bed should be localised to aid accurate delivery of radiotherapy according to local protocols.

The MDM should agree a strategy for managing the axilla before surgery. The strategy should acknowledge the following two points.

- Axillary ultrasound and needle biopsy of abnormal lymph nodes should be performed at pre-operative staging.
- Intra-operative assessment of the sentinel lymph node (SLN) or staging sentinel lymph node biopsy (SLNB) may help reduce the need for further axillary surgery. The sensitivity of intra-operative assessment varies with different techniques.

3.2 Patient factors

In general, the timing, availability and choice of reconstruction technique will depend on:

- local and systemic disease burden
- the likelihood of the patient requiring adjuvant treatment (chemotherapy or radiotherapy)
- familial and genetic risk factors
- comorbidities
- BMI[1]
- ASA score
- drug and smoking history
- psychological suitability
- occupation, activities and lifestyle
- pre-existing shoulder or musculoskeletal problems
- the patient's expectations, choices, goals and attitudes to risk
- the likely impact of recovery time on the patient's family, employment and daily activities.

Additional risks should be discussed and should be clearly stated when discussing options with the patient. An anaesthetic opinion should be requested before admission when there is clinical concern.

[1] Although BMI is not an absolute contraindication to surgery, there is a clear understanding that performing breast reconstruction on patients with a high BMI will lead to a high complication rate. Overall, the Breast Reconstruction Expert Advisory Group supports delivery of breast reconstruction up to a BMI of 35. However, patients undergoing delayed reconstruction should be strongly encouraged to use their waiting time for surgery to bring down their weight to a lower BMI as this will improve their surgical outcome. Any cases that vary from best practice must have the reason for the variance well documented, and the patient must be well informed of the additional risks and delays in reconstruction.

3.3 Equity

There is a noted inequity in the patients being accepted for breast reconstruction in New Zealand. Māori and Pacific patients have a much lower representation rate than 'other' ethnicities, and the disparity cannot be attributed solely to patient choice (Seneviratne et al 2017; Allan et al 2020). At the referral acceptance stage for breast reconstruction, some breast units apply an eligibility criteria, such as being a non-smoker and BMI of under 30; both parameters are equity reducing measures that disproportionately affect Māori and Pacific women. Also, different breast units accept different BMIs for immediate and/or delayed breast reconstructions.

The Ministry of Health's definition of equity is: "In Aotearoa New Zealand, people have differences in health that are not only avoidable but unfair and unjust. Equity recognises different people with different levels of advantage require different approaches and resources to get equitable health outcomes" (Ministry of Health 2019). It is important that breast units work towards reducing the inequities currently seen in access to breast reconstruction. In some instances, this may involve accepting variance from the BMI criteria discussed above.

3.4 Psychological assessment

Breast reconstruction units should work towards providing comprehensive psychological assessment for all patients. If this is currently unavailable, then patients may be able to be referred to support available through the breast cancer pathway, although it should be noted that these practitioners may not be specifically trained to support women through issues associated with reconstruction. Ideally:

- there would be an agreed strategy in place for psychological assessment and management
- there would be access to a breast reconstruction nurse specialist within the breast unit, in addition to the cancer department nurse specialist
- the psychological wellbeing of each patient would be assessed by a suitably trained member of the MDT pre-operatively to determine the patient's psychological needs
- where complex psychological difficulties are identified, the patient would have access to more specialised psychology services
- established screening tools would be used to assess the patient's psychological morbidity.

3.5 Photographic assessment

Medical photography should be available in all breast units, and a full and tiered consent process must be followed with each patient.

Pre-operative and successive post-operative photographs should be taken for consenting patients undergoing breast conserving surgery or mastectomy. A standard set of views should be acquired in an appropriate setting for each patient. See *IMI National Guidelines: Guide to Good Practice, Breast photography* for more information (Institute of Medical Illustrators 2012).

Not all breast units will have access to clinical photography services yet, and they should work towards this as a best practice, but as a minimum, the units should:

- store all digital images on a secure server with limited access
- place any printed copies in the notes
- never use images for teaching or publication without the patient's expressed consent.

3.6 Quality criteria

Quality criteria: information provision and decision-making	
4	Patients have access to a clinical nurse specialist (CNS) or equivalent key worker with expertise in oncoplastic breast surgery and breast reconstruction.
5	Patients have access to a key worker with expertise in breast reconstruction psychological assessment and management.

4 Information provision and decision-making

It is important to establish at the very start the patient's preference for the amount, and type, of information they wish to receive and their level of involvement in the decision-making process. Patients will differ in the amount and type of information they need and their desire to be involved in treatment decision-making. Regret and dissatisfaction with an outcome can be associated with poor or inadequate information provision that does not meet a patient's individual needs.

Deciding whether to undergo breast reconstructive surgery can be difficult. However, patients should be made aware that breast reconstructive surgery may not be available locally and that they may have to travel to another breast unit for treatment.

4.1 Information format

Patients should have easy access to:

- information in languages other than English and/or interpreters if necessary
- information that meets their individual and changing needs over time in a choice of formats (for example, pamphlets/brochures and books, illustrations and photographs, DVDs, face-to-face meetings, audio, recommended websites – see Appendix B)
- a library of photographs of a range of surgical procedures and outcomes (including breast and donor site outcomes).

Support and information should be available to partners and other family members where appropriate.

4.2 Supporting patients' decision-making

Discussions should take place in an appropriate and private setting. Patients should have:

- access to all the information they need to make their choice
- enough time to reach a decision
- access to support from a breast care nurse (BCN), who will have expert knowledge in breast reconstruction surgery
- access to a breast reconstruction nurse specialist for information on available supports and surgical and recovery information.

Patient support and counselling may require more than one consultation. Patients who are finding it particularly difficult to make a decision should not feel pressured to do so and should be referred for additional support. MDTs should have referral routes in place to help this happen smoothly and quickly.

Any decisions regarding additional surgery should be made by the patient and their MDT.

A full account of the outpatient consultation(s) should be summarised in a letter to the patient's GP and made available to the patient with their prior agreement.

4.3 Information about surgical options

Some potential morbidities and complications are associated with breast reconstruction. Section 6.1 discusses the long-term complications and unplanned reoperations that could occur.

All discussions should take place in an appropriate and private setting. Patients should have easy access to current, reliable, balanced information relating to suitable surgical options. The options offered should be clearly documented along with reasons why other options are unsuitable. The surgical team must be careful to avoid using emotive or persuasive language when discussing the options with patients.

Patients should be made aware of planned additional procedures that may be required and the possibility of unplanned procedures. Appendix B provides more information on the details that should be given and discussed with patients to help them make an informed decision.

4.4 Information about available support

Patients who are considering breast reconstructive surgery should be provided with access to:

- psychosocial support and information services throughout their treatment (see Appendix C for a list of useful support services for cancer patients)
- a variety of resources offering information and support, including opportunities to learn from the experiences of other women who have undergone similar procedures and information and support for partners, families and friends
- a breast reconstruction nurse specialist to provide information on available support options and surgical and recovery information.

4.5 Information about the outcomes of breast reconstructive surgery

Patients should be given key information about outcomes of breast reconstruction surgery. All patients should be informed about:

- the look and feel of a reconstructed breast, which will not be the same as a natural breast
- the possible psychosocial implications of undergoing breast reconstructive surgery, including the time taken to adjust to a reconstructed breast and an altered body image (typically one year or longer), and the potential impact on quality of life, emotional wellbeing and sexual functioning
- the range of physical and psychological effects of surgery (for example, discomfort, lack of sensation, self-consciousness, body image issues) which contribute to satisfaction with the outcome
- the fact that the exact aesthetic outcome of any individual breast reconstructive surgery procedure cannot be predicted before the surgery
- the opportunity for a delayed procedure if immediate breast reconstruction is not chosen or advisable
- the likely timeframe for their surgery.

4.6 Information about inpatient stay

The patient should informed about the hospital stay, including:

- the pre-surgical and anaesthetic assessment and procedures that will take place
- the length of the planned operation
- the likely length of stay in hospital, including details of enhanced recovery techniques where available
- what to bring into hospital
- visiting hours
- what to expect regarding:
  - drains
  - urinary catheters and invasive lines
  - pain relief
  - devices for warning of and preventing venous thromboembolism (VTE)
  - high dependency unit (HDU) care where anticipated
  - dressings and sutures
- what bras are suitable for the immediate post-operative period.

4.7 Patient support during the inpatient stay

The patient's emotional wellbeing should be assessed during their hospital stay. Emotional and psychosocial support should be available throughout the inpatient stay as necessary, with easy access to the patient's BCN / key worker. Appropriate cultural support should be provided, for example, for Māori patients, support should be offered that acknowledges te ao Māori (the Māori world view) and provides safety across the

four domains of health (te whare tapa whā): te taha wairua, te taha hinengaro, te taha whānau and te taha tinana.

All breast reconstruction units should work towards offering each patient:

- a chaperone to accompany any examination
- access to psychosocial support during their hospital stay, as necessary (for example, a breast nurse for level 2 support and a psychologist for level 3 and 4 support as available and considering local constraints)
- ongoing access to the BCN (along with their contact number, if appropriate and agreed to by both parties, for ongoing support and advice)
- access to a breast reconstruction nurse specialist (clinical nurse specialist, CNS, level) to provide psychosocial support and recovery advice.

Patients at high risk (for example, those who have a psychiatric history, poor coping skills, limited social support) should be monitored post-operatively, and further contact to confirm their psychological recovery should be negotiated and agreed with the patient. This arrangement should be documented in the hospital notes.

4.8 Quality criteria

Quality criteria: pre-operative phase	
6	Patients receive locally agreed, written (or in another accessible format) information about the risks and benefits of breast reconstruction in a format and level of detail that meets their individual needs.
7	The letter to the patient's GP summarises the patient's care and further support required and is available for the patient to read.

5 Operative and early post-operative phase

5.1 Implants

- The implants to be used in each case on every theatre list must be verified before the patient is anaesthetised.
- All implants (including biological and synthetic mesh) should be identifiable and traceable and any adverse events reported promptly to Medsafe.
- A database should be established to record implant use (for example, implants and acellular dermal matrices, ADMs) and complete details as specified by the manufacturer to enable subsequent review, audit and response in the case of any product recall.

At the time of publication, New Zealand did not have a national registry tool for breast implants, including biological and synthetic mesh, however, a registry should be used whenever one becomes available.

Information on implants and available support can be found in Appendix B.

5.2 Timing of adjuvant therapy

- Adjuvant chemotherapy should be started as soon as it is considered safe with respect to wound healing, and the surgical and oncological teams should coordinate to ensure there are no unnecessary delays.
- The use of radiotherapy after breast reconstructive surgery should conform to evidence-based best practices.
- All complications or other issues impacting or potentially impacting on the delivery of adjuvant therapy should be discussed at the MDM.

5.3 Discharge expectations

At the time of their discharge, the patient should be:

- wearing compression stockings and be advised to continue wearing them until they are moving normally around the home
- given discharge information that includes post-op instructions, written instructions for post-op exercises and breast reconstruction clinical nurse specialist contact information
- given a drain chart to record their drain outputs
- referred for follow-up outpatient clinic appointments at:
  - a district nurse clinic for dressing changes and drain (for review one week after the operation)
  - a Senior Medical Officer (SMO) clinic (for review four to six weeks after the operation)
  - an outpatient physiotherapy clinic.

5.4 Quality criteria

Quality criteria: post-operative phase	
8	Patient-reported outcomes/satisfaction should be recorded using standard patient reported outcome measure (PROM) tools, including measuring the patient's satisfaction with their appearance when clothed.

6 Following discharge phase

6.1 Long-term complications and unplanned reoperations

- Morbidities and complications associated with breast reconstruction include those associated with more major surgery, longer recovery time, higher risk of wound-healing problems, loss of autologous tissue, loss of an implant, a frequent need for subsequent surgery, reduced muscle strength, hernia or bulge at the donor sites, and pain and scarring at the donor sites and on the breast.
- Revisional surgery due to complications such as capsular contracture may be required longer term. Revisional surgery, implant exchange, capsulectomy, nipple areola reconstruction, contralateral reduction or mastopexy, and delayed reconstruction are all available to women in the public health service, within a reasonable timeframe (National Breast Cancer Tumour Standards Working Group 2013, section 8.21).
- Women who have undergone breast-conserving surgery and are unhappy with the outcome (including symmetry) are referred for discussion of reconstruction or revisional or contralateral breast surgery (National Breast Cancer Tumour Standards Working Group 2013, section 8.22).
- Psychological consequences of breast cancer can be severe for some patients and may be delayed, presenting months or years after the completion of treatment. Health care professionals should be aware that some patients may need additional psychosocial support.

6.2 Patient support

- A discharge summary should be sent to the patient's GP, and any help required with drains and dressings should be arranged to take place in the community where appropriate.
- Out-of-hours contact details should be provided to all patients.
- Patients undergoing immediate breast reconstruction should be given clear details of the first follow-up appointment where the histopathology results will be discussed, if appropriate, and a treatment plan will be agreed.
- Patients should have early access to specialist physiotherapy. This is particularly important for rehabilitation after extensive breast reconstructive surgery to reduce morbidity, such as frozen shoulder or lymphoedema, and to regain mobility as rapidly and safely as possible. The physiotherapy must be available and carried out by an experienced physiotherapist who is familiar with the surgical techniques and potential complications.
- At the time of publication, there were limited public lymphoedema support services available. Such services should be offered in all regions – at the least, a breast unit should work towards having a lymphoedema nurse to support patients, specialist lymphoedema physiotherapy and access to non-operative management and bandaging. Operative management may only be available in limited regions.
- Patients should be provided with information about the availability of longer-term support, including what support is available, how it can be accessed, who to contact and how contact can be made. Information should provide details of team members involved in the support options and other sources of support, such as local and national support groups (see Appendix B).
- Patient's ongoing adjustment should be considered, assessed and addressed during routine follow-up appointments, and those requiring higher-level psychological interventions (levels 3 and 4) following discharge should be identified and referred on as appropriate.
- Patient satisfaction with the reconstructed breast, the donor site and provision of care should be assessed, using validated instruments, at regular intervals, for example, at six months, one and five years or until active follow-up is completed.
- A mechanism should be in place to refer the patient back for revisional surgery. When it is needed, revisional surgery for breast cancer patients should be provided by district health boards (DHBs) in a timely fashion.
- Patients should have access to a breast CNS and/or breast reconstruction CNS.

6.3 Quality criteria

Quality criteria: care discharge phase	
9	Local recurrence rates following reconstruction should be no higher than for breast cancer surgery as a whole. *An indicative rate is from Surgical guidelines for the management of breast cancer (Association of Breast Surgery at BASO 2009), which states that local recurrence rates should be less than 5% at five years, with a target of less than 3% at five years.*
10	Eligible patients are invited to take part in local and national clinical trials and audits of oncoplastic breast surgery.

7 Data collection and auditing

7.1 General requirements

An ongoing, prospective audit is essential to ensure a high-quality surgical service. Units should routinely collect outcome data for each patient undergoing breast reconstructive surgery and, as a minimum, individual patient care should be audited against agreed performance indicators and target standards. This core outcome set will include a combination of process and clinical, cosmetic and patient-reported outcomes. The MDT plays a pivotal role in ensuring that accurate, complete and timely data is submitted for all breast cancer patients to allow a meaningful long-term comparison of outcomes following both oncological and oncoplastic procedures.

Each surgical unit should identify an audit lead who will assume overall responsibility for this process and can ensure that a secure electronic database is used to help collect data in a timely manner.

Most current local systems do not support appropriate breast reconstruction auditing, and the development of a national or local audit system has been impeded by the cost of implementing and maintaining such a system, along with issues around privacy, data collection and storage.

All breast reconstruction units should be working towards setting up an appropriate auditing system, and monitoring reconstruction uptake with the aim of improving reconstruction rates to match international best practice (Salindera et al 2020). Summary audit data related to key performance indicators should be presented as part of the unit's peer review process and may be used in revalidating the unit.

Appendix A: Quality criteria for best practice

Table 1: The quality criteria for each section of the breast reconstruction national best practice guidelines

Quality criteria: patient pathway and referral	
1	Breast reconstruction suitability and/or options are discussed with all patients requiring surgery for breast cancer.
2	When a referral for breast reconstructive surgery is made from one MDT to another MDT, full information is made available at the time of the referral and reciprocated following treatment.
3	The oncological and reconstructive management is considered at the MDM. A treatment plan and subsequent modifications are agreed and recorded, including plans for onward referral.
Quality criteria: information provision and decision making	
4	Patients have access to a clinical nurse specialist (CNS) or equivalent key worker with expertise in oncoplastic breast surgery and breast reconstruction.
5	Patients have access to a key worker with expertise in breast reconstruction psychological assessment and management.
Quality criteria: pre-operative phase	
6	Patients receive locally agreed written (or in another accessible format) information about the risks and benefits of breast reconstruction in a format and level of detail that meets their individual needs.
7	The letter to the patient's GP summarises the patient's care and further support required and is available for the patient to read.
Quality criteria: post-operative phase	
8	Patient-reported outcomes/satisfaction should be recorded using standard patient reported outcome measure (PROM) tools, including measuring the patient's satisfaction with their appearance when clothed.
Quality criteria: care discharge phase	
9	Local recurrence rates following reconstruction should be no higher than for breast cancer surgery as a whole. *An indicative rate is from Surgical guidelines for the management of breast cancer (Association of Breast Surgery at BASO 2009), which states that local recurrence rates should be less than 5% at five years with a target of less than 3% at five years.*
10	Eligible patients are invited to take part in local and national clinical trials and audits of oncoplastic breast surgery.

Appendix B : Information to help patients give their informed consent

General information

Information that should be given to patients and discussed with them in detail includes:

- the types of breast reconstructive surgery available, their risks and benefits and the individual suitability of each type for the patient
- the common requirement for multiple procedures to achieve a final result
- the likely length of hospital stay for each procedure
- the likely length of time needed to return to normal daily activities after each type of procedure
- the timing of breast reconstructive surgery and the risks and benefits of immediate and delayed procedures, including:
  - psychosocial implications
  - treatment and technical implications, for example, the implications of adjuvant treatments such as radiotherapy
- the effects of radiotherapy on autologous reconstructions and implants
- the influence of chemotherapy and reassurance that there is no evidence that reconstruction leads to delays in chemotherapy administration
- reassurance that breast reconstructive surgery does not impede detection of future cancers
- the likely position and length of scarring on the breast and any donor site
- the risks of smoking, and the influence of other risk factors
- alternatives to BR, including no reconstruction and the use of prostheses
- the possibility of contralateral surgery, including types, timing, risks and benefits, and possible outcomes

- the possibility of nipple reconstruction, including alternatives to surgery (for example, tattooing, NAC prosthesis)
- complications and sequalae leading to unnatural breast consistency and appearance (hardness, movement, ptosis, wrinkling, etc)
- details of local and national support services (see Appendix C). Patients offered immediate breast reconstruction should be assured that a reconstruction is also available at a later date, as a delayed procedure.

Definitions of complications

Term	Definition
Implant infection	Post-operative infection involving the implant, often presenting as redness of the overlying skin, pain and swelling and usually requiring return to theatre, washout and replacement or removal of the implant
Partial flap failure	Death of part of the transferred tissue (either skin, fat or muscle), requiring removal of part of the flap in theatre
Mastectomy skin envelope necrosis	An area of skin that has died off, requiring removal by chemical or surgical means
Total flap failure	Death of the entire flap, requiring return to theatre and removal of the whole flap used in the reconstruction
Return to theatre	An unplanned reoperation to treat major complications of breast reconstruction, which is documented in the reconstructive database
Systemic complications	Such as deep vein thrombosis (DVT) and pulmonary embolism (PE); cardiac events are rare following breast reconstruction but should be recorded along with admission to HDU due to complications and blood transfusion

Information about implants

Implant safety and regulation is overseen by Medsafe, any suppliers of medical devices must be logged in the Web Assisted Notification of Devices (WAND) Database.

Patients should be informed:

- about potential complications of implants and expanders
- that modern breast implants do not have a specific lifespan and do not need to be routinely replaced in the absence of concerns
- that revision or replacement may be required for adverse symptoms or cosmetic deformity in the longer term (and that they should ask their GP to refer them back to their original provider for assessment if this happens)
- that there are differences between tissue expanders and fixed volume implants and between saline and silicone-based devices
- of the type of implant or expander used, and that they should keep the details about their type of implant or expander
- that up to 1 in 10 patients lose implants in the first 3 months after surgery
- that up to 1 in 2 patients may require revisional surgery in the first 10 years
- of their risk profile for Breast implant-associated Anaplastic Large Cell Lymphoma (BIA-ALCL).

The risks (including lack of long-term data) and benefits of using Acellular Dermal Matrices (ADMs) and other implanted products, such as mesh, should be discussed if appropriate.

Appendix C : Available support services

- **Cancer Society New Zealand:** **https://cancernz.org.nz/**
  A not-for-profit organisation to help and support people with cancer and their whānau

- **Breast Cancer Foundation New Zealand:** **www.breastcancerfoundation.org.nz/**
  A not-for-profit organisation focussed on breast cancer education and awareness, supporting mechanisms that enable early detection, treatment and support.

- **Breast Cancer Aotearoa Coalition:** **www.breastcancer.org.nz/**
  A not-for-profit group run by breast cancer survivors advocating for world-class detection, treatment and care access for everyone with breast cancer in Aotearoa. They provide information, support and representation to those with breast cancer so they can make informed choices about their treatment and care.

- **Health Navigator New Zealand:** **www.healthnavigator.org.nz/**
  A platform for New Zealanders to find reliable and trustworthy health information and self-care resources. It is a non-profit community initiative combining the efforts of a wide range of partner and supporter organisations and is overseen by the Health Navigator Charitable Trust.

- **Ministry of Health:** **www.health.govt.nz/**
  The New Zealand Ministry of Health is the Government's principal advisory on health and disability: improving, promoting and protecting the health of New Zealanders.

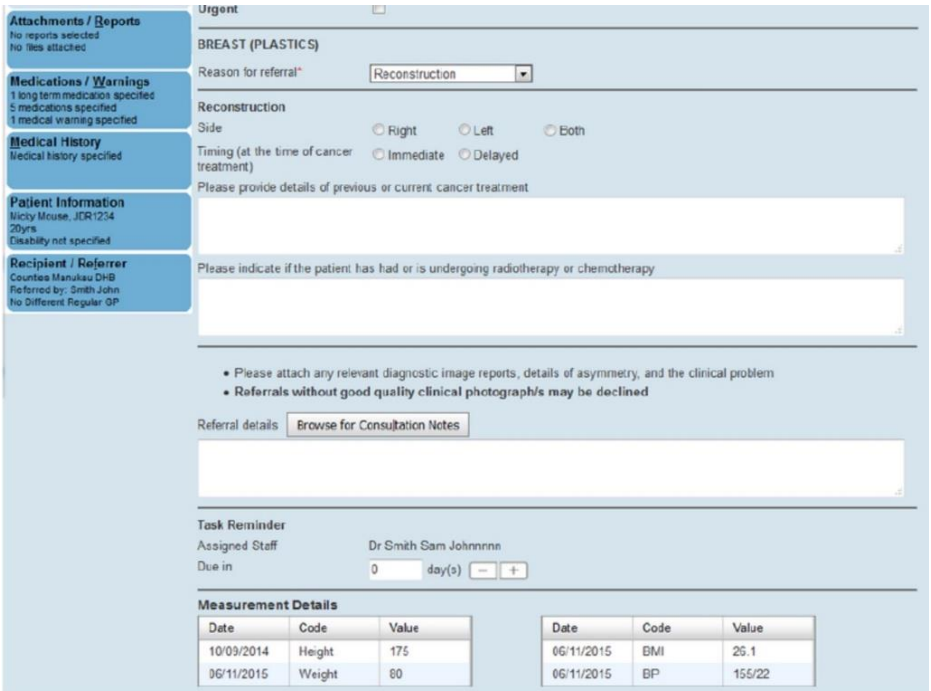
- **Te Aho o Te Kahu, Cancer Control Agency:** **https://teaho.govt.nz/**
  An independent departmental agency reporting directly to the Minister of Health. They are equity led, whanau-centred, knowledge driven, and outcomes focused, providing strong oversight and leadership for cancer control in New Zealand.

- **Cancer Research UK:** **www.cancerresearchuk.org/**
  The world's leading independent cancer charity dedicated to saving lives through research, influence and information. A reliable source of information for both clinicians and patients.

Appendix D: Referral template

Breast units should provide referrers and the MDM with a proforma template to support comprehensive information sharing across specialties. Below is a list of the core details that should be included on a referral template and an example referral template that was used at Counties Manukau District Health Board in 2020.

Referral to plastics	
Patient information	Name, NHI, date of birth, address
Referrer details	
Medical history	
Medications/Warnings	Incl. smoking status, anticoagulation
Priority	Urgent or routine
Reason for referral	Reconstruction
Reconstruction detail	Side
	Timing (immediate or delayed)
	Details of previous or current cancer treatment
	Radiotherapy or chemotherapy treatment or plans for treatment
Referral details	Attach any relevant diagnostic image reports, details of asymmetry and the clinical problem
Patient measurements	Including: height, weight, BMI, blood pressure



Glossary

Term	Description
Acellular dermal matrix (ADM)	A product used in breast reconstruction that is derived from human or animal skin
Adjuvant therapy	Treatment given after surgery, such as radiotherapy, chemotherapy or hormonal treatment
Alloplasty	Reconstruction of a native tissue with a synthetic material
ASA	A physical status classification system used in assessing the fitness of patients before surgery. In 1963, the American Society of Anesthesiologists (ASA) adopted the five-category physical status classification system (a sixth category was later added). The following four-point scale was used in the National Mastectomy and Breast Reconstruction Audit (NMBRA): • A normal healthy patient • A patient with mild systemic disease that does not limit activity • A patient with severe systemic disease that limits activity but is not incapacitating • A patient with incapacitating systemic disease that is constantly life-threatening.
Autologous breast reconstruction	Reconstruction of the breast mound (or shape) using only the patient's tissue (without any prosthesis or implant)
Breast care nurse (BCN)	A health care professional who provides supportive psychological and physical nursing care for patients with breast disease
Breast conserving surgery	A surgical procedure to remove an abnormality from the breast, preserving the remaining breast tissue
Breast reconstructive surgery	Techniques that combine mastectomy or wide local tumour resection with reconstruction of the defective area in the breast to optimise oncological and cosmetic outcomes
Body mass index (BMI)	A measure of whether a person is a healthy weight for their height
Capsulectomy	The operative removal of implant and scar tissue, or capsule
Chemotherapy	Drug therapy used to treat cancer; may be used alone or in conjunction with other types of treatment (for example, surgery or radiotherapy)
Comorbidities	One or more illnesses in addition to the primary disorder
Contralateral symmetry surgery	Surgery on the opposite breast to improve the overall symmetry with a reconstructed breast
Delayed breast reconstruction	Reconstruction of the breast mound (or shape) after a mastectomy has already been performed (this reconstruction is undertaken as a separate operative procedure)
FSA	First specialist appointment
GP	General practitioner
HDU	High dependency unit
Immediate breast reconstruction	Reconstruction of the breast mound (or shape) at the same time as the mastectomy, undertaken as part of the same operative procedure

Term	Description
Implant	A prosthesis, usually made of silicone, used to replace breast volume in breast reconstruction
Implant-only breast reconstruction	Reconstruction of the breast mound (or shape) using a tissue expander (the volume can be increased by injecting saline through a port placed under the skin) or a definitive implant (the volume is fixed) (The expander or implant is usually placed under the pectoral (chest) muscle. A tissue expander may be exchanged for a definitive implant or left in place after expansion, depending on the type of device used.)
Lymphoedema	Swelling due to the build-up of protein-rich fluid in the tissues. In breast cancer patients, this occurs when the lymphatic drainage system that normally removes this fluid is damaged by surgery or radiotherapy to the armpit (the swelling usually affects the arm on the treated side)
Multidisciplinary meeting (MDM)	A regular timetabled meeting for members of the MDT
Multidisciplinary team (MDT)	A group of professionals from different disciplines that works to, in this instance, optimise breast cancer diagnosis and treatment throughout the patient's care pathway
Medsafe	New Zealand Medicines and Medical Devices Safety Authority, the business unit of the Ministry of Health that is responsible for the regulation of therapeutic products in New Zealand
NAC	Nipple areola complex
Neoadjuvant	Administering chemotherapy or hormonal treatment before surgery
National Health Index number (NHI)	A unique identifier assigned to every person who has ever used the health and disability support services in New Zealand
National Institute for Health and Clinical Excellence (NICE)	An independent organisation responsible for providing national guidance on ways to promote good health and prevent and treat ill health
Pedicle flap reconstruction	Reconstruction of the breast mound (or shape) by moving a 'flap' of skin, muscle and fat from the patient's back or abdomen to the breast area, which is kept alive by a 'pedicle' or tube of tissue containing its supplying arteries and veins
Patient reported outcome measure (PROM)	A questionnaire that allows a patient to report their experience of different aspects of their treatment
Prophylactic mastectomy	Surgery to reduce the risk of developing breast cancer by removing one or both breasts before disease develops; also called preventive mastectomy
Radiation therapy	Using controlled amounts of radiation directed to a specific part of the body to kill cancer cells and shrink tumours; also called radiotherapy
Sentinel lymph node (SLN)	The hypothetical first lymph node or group of nodes reached by cancer cells as they spread from a primary tumour
SLNB	Sentinel lymph node biopsy
Venous thromboembolism (VTE)	Blood clots in the leg (deep vein thrombosis) or lung (pulmonary embolus)

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