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The treatment of breast cancer is multimodal (includes surgery , systemic treatment [chemotherapy , targeted therapy , hormonal therapy] and radiotherapy); hence, specialist breast Key points of the eighth edition of the AJCC TNM stag - ing system /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF - centres employ a multidisciplinary team (MDT) that - should include the surgeon, radiologist, pathologist, radiation oncologist, medical oncologist, plastic surgeon and allied health professionals, such as a breast care nurse, psychological counsellor and preferably a genetic counsellor (58.7). While some patients with low disease burden and low bio - logical aggressiveness can be treated with surgery followed by adjuvant therapy , others require downsizing of disease with neoadjuvant systemic therapy or primary systemic therapy . Neoadjuvant systemic therapy (NAST) consists of). neoadjuvant chemotherapy (NACT), targeted therapy or hormonal therapy prior to surgery . It aims to downsize the disease and enable clinicians to know the in vivo response of the tumour to therapy . The indications for NACT are as follows: - 1 Locally advanced breast cancer T3, T4/N2, N3 disease: to downsize the tumour. 2 Select cases of early breast cancer: a to downsize the tumour to facilitate breast conservation surgery (BCS); b HER2/neu-positive tumours; c triple-negative breast cancer (TNBC); d premenopausal women (age <50 years); e patients with axillary node metastasis. /uni25CF Neoadjuvant targeted therapy (trastuzumab, per - tuzumab) is administered for HER2/neu-positive tumours >5 /uni00A0 mm in diameter. - /uni25CF Neoadjuvant hormonal therapy is o ff ered to elderly or frail women (with ER and/or -, PR-positive advanced tumours) who are deemed unfit to receive systemic che - motherapy . Neoadjuvant hormonal treatment takes longer (around 3–6 months) for the response to become clinically evident. /uni25CF Response assessment and timing of surgery : the patient is examined 3 weeks after administration of

Lobular carcinoma in situ (LCIS) is a high-risk benign lesion not a cancer The T categorisation of multiple synchronous tumours is documented using the (m) modi /f_i er The pre /f_i x (y) is used to denote the post-neoadjuvant therapy status Satellite nodules in the skin must be separate from the primary tumour for it to be categorised as T4b Pathological complete response (pCR) denotes the absence of tumour cells in the breast and axillary nodes in surgical specimens In /f_l ammatory carcinoma remains classi /f_i ed as in /f_l ammatory carcinoma after NACT, even after complete remission Microinvasive (T1mi) carcinomas are de /f_i ned as invasive tumour foci ≤ 1.0 /uni00A0 mm Tumours >1 /uni00A0 mm and <2 /uni00A0 mm should be reported as rounded to 2 /uni00A0 mm Tumour size should be measured to the nearest millimetre

edition) for breast cancer. T category T criteria Tx Primary tumour cannot be assessed T0 No evidence of primary tumour Tis(DCIS) Ductal carcinoma in situ (DCIS) Tis(Paget’s) Paget’s disease of the nipple not associated with (Paget’s) invasive carcinoma and/or carcinoma in the underlying breast parenchyma. Carcinomas in the breast

parenchyma associated with Paget’s disease are categorised based on the size and characteristics of the parenchymal disease, although the presence of Paget’s disease should still be noted T1 Tumour ≤ 20 /uni00A0 mm in greatest dimension T1mi Tumour ≤ 1 /uni00A0 mm in greatest dimension T1a Tumour >1 /uni00A0 mm but ≤ 5

/uni00A0 mm in greatest dimension (round any measur T1b Tumour >5 /uni00A0 mm but ≤ 10 /uni00A0 mm in greatest dimension T1c Tumour >10 /uni00A0 mm but ≤ 20 /uni00A0 mm in greatest dimension T2 Tumour >20 /uni00A0 mm but ≤ 50 /uni00A0 mm in greatest dimension T3 Tumour >50 /uni00A0 mm in greatest

dimension T4 Tumour of any size with direct extension to the chest wall and/or to the skin (ulceration or macroscopic nodules); invasion of the dermis alone does not qualify as T4 T4a Extension to the chest wall; invasion or adherence to pectoralis muscle in the absence of invasion of chest wall structures does not qualify as T4a T4b Ulceration

and/or ipsilateral macroscopic satellite nodules and/or oedema (including peau d’orange) of the skin that does not meet the criteria for in /f_l ammatory carcinoma T4c Both T4a and T4b are present T4a /uni00A0 + /uni00A0 T4b /uni00A0

/uni00A0 T4c T4d In /f_l ammatory carcinoma; peau d’orange and redness involving >1/3rd of the surface of the breast with or without a breast lump cN category cN criteria cNx Regional lymph nodes cannot be assessed (e.g. previously removed) cN0 No regional lymph node metastases (by imaging or clinical examination) cN1 Metastases to movable ipsilateral level I, II axillary lymph node(s) cN1mi Micrometastases (approximately 200 cells, >0.2 /uni00A0 mm, but none >2.0 /uni00A0 mm) cN2 Metastases in ipsilateral level I, II axillary lymph nodes that are clinically /f_i xed or matted; mammary nodes in the absence of axillary lymph node metastases cN2a Metastases in ipsilateral level I, II axillary lymph nodes /f_i xed to one another (matted) or to other structures cN2b Metastases only in ipsilateral inter nal mammary nodes in the absence of axillary lymph node metastases cN3 Metastases in ipsilateral infraclavicular (level III axillary) lymph node(s) with or

without level I, II axillary lymph node involvement; or in ipsilateral internal mammary lymph node(s) with level I, II axillary lymph node metastases; metastases in ipsilateral supraclavicular lymph node(s) with or without axillary or internal mammary lymph node involvement cN3a Metastases in ipsilateral infraclavicular lymph node(s) cN3b Metastases in ipsilateral internal mammary lymph node(s) and axillary lymph node(s) cN3c Metastases in ipsilateral supraclavicular lymph node(s) M category M criteria M0 No clinical or radiographic evidence of distant metastases cM0(i+) No clinical or radiographic evidence of distant metastases in the presence of tumour cells or deposits <0.2 /uni00A0 mm detected micr oscopically or by molecular techniques in circulating blood, bone marrow or other non-regional nodal tissue in a patient without symptoms or signs of metastases cM1 Distant metastases detected by clinical and radiographic means c, clinical. in situ (DCIS) ement >1.0–1.9 /uni00A0 mm to 2 /uni00A0 mm) or in ipsilateral inter nal or

in solid tumours (RECIST) are used for reporting the response to NAST . The four RECIST categories are: /uni25CF complete response (CR) (lesion not detectable on clini cal palpation and imaging); /uni25CF partial response (PR) (≥ 30% reduction in the maximal diameter); /uni25CF stable disease (SD) (<30% reduction in maximal diam eter); /uni25CF progressive disease (PD) (≥ 20% increase in the maxi mal diameter). For patients with CR and PR, the entire chemotherapy reg imen may be delivered prior to surgery . If the patient is being planned for BCS, a radio-opaque clip or magnetic marker such ® as Magseed is placed under image guidance in the epicentre of the tumour to allow identification at the time of surgery should there be a complete response to NACT . If the facility for clip placement is unavailable, in place of the metal clip a 0.5-cm piece of silicone or a polyvinylchloride (PVC) catheter tip may be inserted through a small skin incision just anterior to the tumour. This catheter tip remains palpable even after complete regression of the tumour and helps the surgeon in performing removal of the index area for BCS, excising 2 /uni00A0 cm of tissue all around this catheter. For patients showing stable or progressive disease, after the initial two cycles of chemotherapy , the patient should undergo surgery and be given second-line chemotherapy after surgery . Surgical management Surgery plays a central role in the management of breast cancer. There has been a general de-escalation towards more conservative techniques, backed up by clinical trials and meta-analyses showing equal e ffi cacy in locoregional cancer control and survival between mastectomy and WLE/BCS followed by radiotherapy . The aim of surgery is to remove all disease in the breast and axilla with negative margins. The pathologist reports the distance of the tumour to the nearest excision margin in the breast specimen. Indelible India ink is applied on the specimen surfaces. T here should be no tumour cells on the cut edge or ‘inked margins’ of the tumour for invasive cancer. However, in patients with DCIS a minimum of 2 /uni00A0 mm is considered a safe margin. Early breast cancer (stages 0, I ,II) The surgical options for the primary tumour include mastec tomy or BCS. Mastectomy is indicated for large tumours (in relation to the size of the breast), multicentric disease, di ff use microcalcification on a mammogram indicative of DCIS, BRCA -positive cancers, local recurrence following BCS or the patient’s preference. It entails removal of the entire breast tissue, including the skin over the tumour, the nipple–areola complex and the axillary tail. The breast tissue usually extends to a point where the anterior premammary fascia fuses with the William Stewart Halsted , 1852–1922, Professor of Surgery , Johns Hopkins Medical School, Baltimore, MD, USA the breast to the point of fusion between these two fasciae, which usually extends to the level of the second rib above, to - the parasternal edge medially , to the inframammary crease below and to the anterior border of latissimus dorsi laterally . This is di ff erent from the traditional view of raising flaps up to the inferior border of the clavicle superiorly and 2–3 /uni00A0 cm - below the inframammary crease (or

up to the upper fibres of the external oblique muscle/rectus abdominis) inferiorly . - The radical mastectomy (Halsted) included excision of the breast, all the axillary lymph nodes and both the pectoralis major and minor muscles. It is rarely indicated as it causes - excessive morbidity owing to the limitation in movement at the shoulder joint, extensive upper limb lymphoedema, pain and chest wall deformity with no survival benefit compared with less radical surgery . The modified radical mastectomy (MRM) entails mastectomy along with removal of the level I, II and III axillary lymph nodes. Skin- and nipple-sparing mastectomy is an option in DCIS and early breast cancers where a mastectomy is indicated and the tumour is >1 /uni00A0 cm away from the skin and >2 /uni00A0 cm away from the nipple. The breast may then be reconstructed using autologous tissue flaps/fat or a silicone breast implant. Breast conservation surgery (BCS) is aimed at removing the tumour along with a 1-cm margin of normal breast tissue. It is important to orient the surgical specimen with sutures: long lateral (‘L’ for ‘lateral’) and short superior (‘S’ for ‘superior’). This is important if one or more margins is pos - itive on histological examination. Patients with involved mar - gins should have a revision of margins called a ‘cavity shave’. All patients with BCS receive radiotherapy . BCS together with radiotherapy is called breast conservation therapy (BCT): BCS /uni00A0 + /uni00A0 RT /uni00A0 = /uni00A0 BCT . BCS is, however, best avoided in patients with a multicentric tumour, di ff use microcalcifications on a mammogram, a large tumour-to-breast ratio, two times positive surgical margins after re-excision, a history of previous breast or chest wall radiation, systemic lupus erythematosus or other collagen vascular disease (these patients have a high risk of a radiation reaction), or ankylosing spondylitis; it is also best avoided in those with severe orthopnoea (as the patient cannot lie on the radiation table). Wide local excision (WLE) of up to 20% of the breast volume can be achieved by excision of the tumour with ade - quate margins and closure of the defect by approximation of the breast tissue with absorbable sutures. V olume loss greater than 20% or an unfavourable breast-to-tumour ratio requires - an oncoplastic procedure to fill the defect so created by mobilising the breast tissue. Oncoplasty is defined as tumour excision with wide mar - gins followed by repair of the defect by local rearrangement/ replacement of the breast tissue and the nipple–areola com - plex to maintain shape and symmetry . This may be achieved by volume displacement (level 1) (Figures 58.30 and 58.31) or by volume replacement using a distant or local flap (level 2) (Figure 58.32) (Summary box 58.4). Surgery for the axilla The role of axillary surgery is to stage the patient (sentinel lymph node biopsy [SLNB]) and to treat disease by axillary lymph node dissection (ALND) for patients with positive axil 58.8) . lary nodes (Sentinel means ‘a guard’. Like a guard, the first echelon/level of axillary lymph nodes is located at the gateway of the axilla and provides information about the status of axillary node metastasis. The sentinel lymph node refers to the first echelon lymph node in the axilla draining the breast. The sentinel lymph node is identified by the injection of a blue dye (patent blue or methylene blue) and radioisotope technetium-99m-labelled albumin/ sulphur colloid/antimony in the breast. The fluorescent dyes fluorescein or indocyanine green can be used if radioisotope is not available. The combination of fluorescein and methylene blue can detect sentinel nodes with >90% identification. - Indocyanine green can detect sentinel nodes with 95–100% identification. The dye may be injected into the peritumoral tissue or the periareolar, subareolar or intradermal plane. The tracer(s) passes through lymphatics to the sentinel node and is detected visually as a blue-coloured node and/or a hot node (radioactive) with a handheld gamma ray detection probe or as a fluorescent node with blue light (480 /uni00A0 nm for fluorescein) or infrared light (780 /uni00A0 nm for indocyanine green) (Figure 58.33) . ex vivo count of the hot lymph node(s) is noted. All lymph The ex vivo count of the hottest node nodes with >10% of the and blue lymph nodes are removed and sent for histological confirmation of nodal metastasis. This may be done with

(d) Figure 58.30 Volume displacement oncoplasty for an upper outer quadrant tumour the lateral mammary crease (b) . Full-thickness excision of the tumour with 1-cm margins outer quadrant of the breast to /f_i ll the defect cavity (d) . Final sutured wound Figure 58.31 A patient with volume displacement with round-block oncoplasty for a right breast tumour. Sentinel lymph node biopsy. (e) (a) . Skin incision markings extending to the periareolar and (c) . Dermoglandular pillar mobilisation from the lower (e) . Figure 58.32 A patient with volume replacement oncoplasty with a muscle-sparing latissimus dorsi muscle /f_l ap reconstruction for a left breast tumour.

Surgical techniques used to treat breast cancer David Howard Patey , 1899–1976, surgeon, Middlesex Hospital, London, UK. John L Madden , 1913–1999, surgeon, St Claire Hospital, New Y ork, NY Hugh Auchincloss , 1915–1998, surgeon, Columbia College of Physicians and Surgeons, New Y ork, NY , USA. Edward F Scanlon , 1919–2008, surgeon, Evanston, IL USA. methods (GeneSearch Breast Lymph Node Assay™). These methods involve homogenising the node and detecting a gene expression of cytokeratin 19 or mammaglobin by RT-PCR. Frozen-section evaluation of sentinel nodes has a false- negative rate of 10–12%. Wherever the facility for frozen section is not available, the sentinel node should be sent for for malin- preserved para ffi n section processing and haematoxylin and eosin staining. SLNB is contraindicated in patients with inflammatory breast cancer and in those with T4 disease or a history of pre - vious breast or chest wall surgery , breast scar ring (burns) or radiotherapy . This is indicated for stag - ing and local disease control in patients with axillary lymph node-positiv e tumours that are clinically and/or biopsy-proven non-palpable nodes and those with three or more sentinel lymph nodes that are positive for macrometastasis. ALND requires car eful anatomical dissection to protect the axillary vein, thoracodorsal vessels, medial and lateral pecto - ral nerves, intercostobrachial nerves and the long thoracic and thoracodorsal nerves. The intercostobrachial nerv e may be divided in the presence of heavy nodal burden to achieve onco - logical clearance. Le vel I and II nodes are routinely removed (Figure 58.34). Level III axillary dissection is reserved for patients w ho have enlarged level I and II lymph nodes. Breast reconstruction Immediate breast reconstruction o ff ers the advantage of women waking up after surgery with a breast mound. Some women may prefer to undergo delayed reconstruction 6–12 months after completion of their adjuvant treatment. Immediate reconstruction can be performed using silicone gel breast implants or autologous tissue. Silicone gel implants can be placed superficial to (prepectoral) or underneath , USA.

Modi /f_i ed radical Mastectomy mastectomy

- level I, II, III axillary lymph node dissection: pectoralis minor muscle is removed in Patey/Madden, retracted in Auchincloss and is divided but not removed in Scanlon modi /f_i cations Simple or total Mastectomy including axillary tail mastectomy without axillary surgery Skin-sparing Mastectomy: breast skin envelope mastectomy is preserved, nipple–areola complex removed Mastectomy: breast skin envelope and Skin + nipple/ areola-sparing nipple–areola complex are preserved mastectomy Removal of tumour with a three- WLE (synonyms lumpectomy; dimensional clearance of a 1-cm margin breast of normal tissue conservation surgery, BCS) Quadrantectomy Removal of the tumour-containing quadrant of the br east Level I oncoplasty Volume displacement technique involves dual-plane mobilisation of the breast par enchyma (i.e. the dermoglandular plane and the plane between breast par enchyma and pectoralis muscle) to close the defect created after WLE Level II More complex pr ocedures that involve oncoplasty skin excision

and glandular mobilisation to allow major volume r esection, usually more than 20% of breast volume (a) (b) Figure 58.33 Sentinel lymph node biopsy done using (a) (b) indocyanine green – the /f_l uorescent sentinel lymph node is seen using infrared imaging with a ‘spy camera’; blue sentinel lymph nodes and lymphatics are seen in the axilla. Sentinel lymph nodes are marked with an arrow. Axillary lymph node dissection. (c) /f_l uorescein dye – the /f_l uorescent sentinel lymph node is seen with blue light; (c) blue dye (methylene blue) –

(subpectoral) the pectoralis major muscle. The tissue fl aps commonly used include the latissimus dorsi (Figure 58.35 the transverse rectus abdominis myocutaneous (TRAM) (Figure 58.36), the anterolateral thigh and the deep inferior epigastric perforator (DIEP) free tissue transfers (Figure 58.37 The DIEP fl ap is commonly used in the UK. It requires microvascular surgical skills and an operative time of about Paolo Mascagni , 1755–1815, Italian physician and anatomist, published the fi rst complete description of the lymphatic system. 4 /uni00A0 hours. The treatment algorithm for breast reconstruction is), set out in Figure 58.38 . Radiotherapy after insertion of a silicone prosthesis often leads to a high incidence of capsular contracture and unac -). ceptable results. To achieve symmetry after breast r econstruction or BCS, the opposite breast may require a cosmetic procedure such as

Thoracic duct Jugular lymph trunk Right lymphatic duct Bronchomediastinal lymph trunk Subclavian lymph trunk Interpectoral nodes Lateral thoracic vein Internal mammary lymph nodes (b) Biceps and coracobrachalis muscles Pectoralis major Pectoralis Subscapular minor nerves Axillary artery Axillary vein Latissimus dorsi muscle Subscapularis muscle Thoracodorsal nerve Long thoracic nerve Supraclavicular nodes Apical nodes Cephalic vein Cephalic Mascagni lymphatic pathway Level Level II III Lateral nodes Level I Central nodes Pectoral lymph nodes Sappey’s subareolar plexus Figure 58.34 (a, b) Lymphatic drainage of the breast depicting level I, II and III lymph nodes.

reduction or augmentation mammoplasty or mastopexy . The patient needs to be informed that she may require more than one procedure for symmetrisation . Surgical options for locally advanced breast cancers (stages IIIA, IIIB) Following NACT patients should be o ff ered the option of mastectomy or BCS, if suitable (Figure 58.38). Patients with initial skin or chest wall involvement and those with inflamma tory carcinoma should undergo MRM (58.9). The role of SLNB in patients with cT3N0 disease and those who become N0 after NACT is currently being studied in a number of trials. A high false-negative rate (>10%) has been reported; this can be reduced if at least three sentinel nodes are removed using dual tracers or using ‘targeted SLNB’. In the targeted technique, a metal clip or permanent India ink is applied to a positive node prior to NAST . During surgery after NAST , the node containing the clip or India ink is removed along with SLNB. Adjuvant treatment Radiotherapy Radiotherapy is shown to decrease the risk of locoregional and systemic recurrence and improve survival. The indications include the following: /uni25CF patients with locally advanced breast cancers T3, T4, N1, N2, N3 disease; /uni25CF following BCS; /uni25CF after mastectomy if: /uni25CF tumour size ≥ 5 /uni00A0 cm; skin or chest wall involvement; lymphovascular invasion (LVI), grade 3; /uni25CF axillary lymph node positive for metastasis. In pathologically lymph node-negative tumours, radio - therapy after BCS is given to the breast only as a dose of 45–50.4 /uni00A0 Gy (with or without a boost) delivered in 25 fractions or of 40–42.5 /uni00A0 Gy delivered in 15 or 16 fractions (hypofrac - tionation). In patients after mastectomy (T3N0M0), chest wall

radiotherapy is given if the sentinel lymph nodes are nega - tive. In patients with lymph node-positive disease locoregional radiotherapy is given covering the chest wall, supraclavicular - region, inter nal mammary nodes and the axilla. The axilla should not be irradiated after axillary node dissection as this increases the risk of lymphoedema. Accelerated partial breast irradia tion (APBI) is a modality of radiotherapy for selected patients meeting the following

Figure 58.35 Reconstruction with latissimus dorsi /f_l ap. Figure 58.36 Transversus abdominus muscle /f_l ap. Latissimus dorsi myocutaneous /f_l ap Deep inferior Superior gluteal epigastric artery perforator perforator /f_l ap /f_l ap Anterolateral Inferior gluteal thigh /f_l ap artery perforator /f_l ap Profunda artery Transverse upper perforator /f_l ap gracilis myocutaneous /f_l ap Figure 58.37 Autologous tissue options for breast reconstruction.

criteria (American Society for Radiation Oncology ABPI guidelines, 2016): /uni25CF women 50 years or older with T1 disease and negative resected margins with a margin width of ≥ 2 /uni00A0 mm, invasive ductal carcinoma, no LVI, ER positive, BRCA negative and sentinel node negative; /uni25CF women 50 years or older with low-risk DCIS (screen detected, low/intermediate nuclear grade, tumour size ≤ 2.5 /uni00A0 cm, negative resected margin widths ≥ 3 /uni00A0 mm). The tumour bed is irradiated along with a narrow rim of surrounding tissue so as to avoid the potentially harmful e ff ects of irradiation on healthy tissue . It is delivered twice daily for 5 days. Adjuvant systemic therapy The purpose of adjuvant systemic therapy is to control puta tive micrometastases, delay relapse and prolong survival. The results of many international clinical trials, including National Surgical Adjuvant Breast and Bowel Project (NSABP) trials and the Oxford overview meta-analyses b y the Early Breast Cancer Trialist Collaborative Group (EBCTCG), demonstrate the benefit of chemotherapy in improving relapse-free survival by approximately 30% and overall survival by 10% at 15 years. This is the most common systemic treatment for breast cancer. The following regimens are used: /uni25CF cyclophosphamide (C), methotrexate (M) and 5-fluorouracil (F) (CMF); /uni25CF anthracycline-based regimens: CAF (A, Adriamycin [doxo rubicin]), CEF (E, epirubicin); /uni25CF taxane (docetaxel, paclitaxel)-based regimens. Adjuvant chemotherapy is indicated for all invasive car cinomas >1 /uni00A0 cm in diameter, tumours >0.5 /uni00A0 cm with poor prognostic factors (presence of LVI, high grade, HER2/neu positive, TNBC) and node-positive tumours. Currently , deci - sions to administer chemotherapy as well as to choose a par - ticular regimen are based on tumour stage, tumour biology and discussion with the patient and/or care giver in an MDT . Gene signature panels help in assessing the benefit of chemotherapy in low-risk tumours , i.e. ER-positive, HER2/ neu-negative and node-negative tumours. The risk of recur - ® rence (ROR) scores include Oncotype Dx (21-gene recur - ® rence score), Prosigna PAM-50 (breast cancer prognostic gene ® signature) and MammaPrint (70-gene breast cancer recur - ® rence assay). Oncotype Dx is the most widely used ROR score and measures the expression of 16 cancer-related genes and five reference genes on para ffi n-embedded tumour tissue. The assay classifies the ROR score as low (<18), moderate (19–30) or high (>30). In patients with a low ROR score, chemotherapy can be avoided. - In patients with endocrine-responsive breast cancer, those with luminal A tumours may avoid chemotherapy if they ® have a low-risk score on Oncotype Dx and/or clinical risk assessment online tools (e.g. https://breast.predict.nhs.uk/ tool); however, patients with a high clinical and genomic risk should be considered for chemotherapy with an anthracycline (epirubicin) or taxane-based therapy . Patients with lumi - nal B tumours should receive an anthracycline and/or taxane-based therapy because of the greater risk of relapse. Those with HER2/neu-positive tumours should receive

trastuzumab+pertuzumab along with chemotherapy (taxane /uni00A0 + /uni00A0 anthracycline), while those with triple negative tumours should receive chemotherapy (taxane /uni00A0 + /uni00A0 anthra - cycline). Carboplatin-based regimens may be beneficial for - tumours with aggressive biology . The monoclonal antibody trastuzumab ® - (Herceptin) is e ff ective against the HER2/neu receptor. It is used along with pertuzumab to treat HER2/neu-positive

Candidate for breast conservation therapy Volume displacement Volume oncoplasty replacement (breast tissue oncoplasty rearrangement) Skin/muscle/ fascia or Autologous combined fat grafting /f_l aps Figure 58.38 Surgical options in women undergoing breast-conservating surgery and reconstructive options for women requiring mastectomy. DIEP , deep inferior epigastric perforator; TRAM, transverse rectus abdominis myocutaneous. Chemotherapy. Requires mastectomy Combined Expander/ Autologous autologous + implant-based reconstruction implant reconstruction Abdomen- Latissimus Other tissue based /f_l aps dorsi /f_l ap sources (DIEP , TRAM) Targeted therapy.

T-DM1 is used in HER2/neu-positive disease: a chemother apy agent, emtansine, is conjugated to trastuzumab to allow targeted delivery of the chemotherapy to HER2-positive cells. The selective oestrogen receptor modula tor tamoxifen and ar omatase inhibitors (anastrozole, letrozole, exemestane) are used for hormonal therapy in breast cancer. In premenopausal patients only tamoxifen is used for 5 years in low-risk patients and for 10 years in patients with a high risk of relapse (node positive, tumour >5 /uni00A0 cm, LVI). Aromatase inhibitors are used in postmenopausal women; in an adjuvant setting they have shown beneficial e ff ect com pared with tamoxifen in terms of relapse-free survival and overall survival. The y are more expensive than tamoxifen and their use is associated with bone density loss and risk of frac ture. A bone density scan is advised prior to commencement of trea tment with aromatase inhibitors. Bisphosphonates with vitamin D and calcium are used to restore bone loss and may also reduce the risk of recurrence .

Hormone therapy.

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