



Revision

Introduction

- Approximately 50,000 new cases of breast cancer are diagnosed each year in the UK, around a quarter of these following screening mammography.
- The 5 year survival is 85%, although this figure includes cases detected by screening as well as those identified after symptoms have occurred.
- About 1:8 women in the UK will get breast cancer in their lifetime.

Aims and Objectives

- Risk factors
- Anatomy of the breast
- Breast cancer screening
- Symptoms of breast cancer
- Types of breast cancer
- Treatments – hormonal, surgical, radiotherapy and chemotherapy
- Benign breast conditions

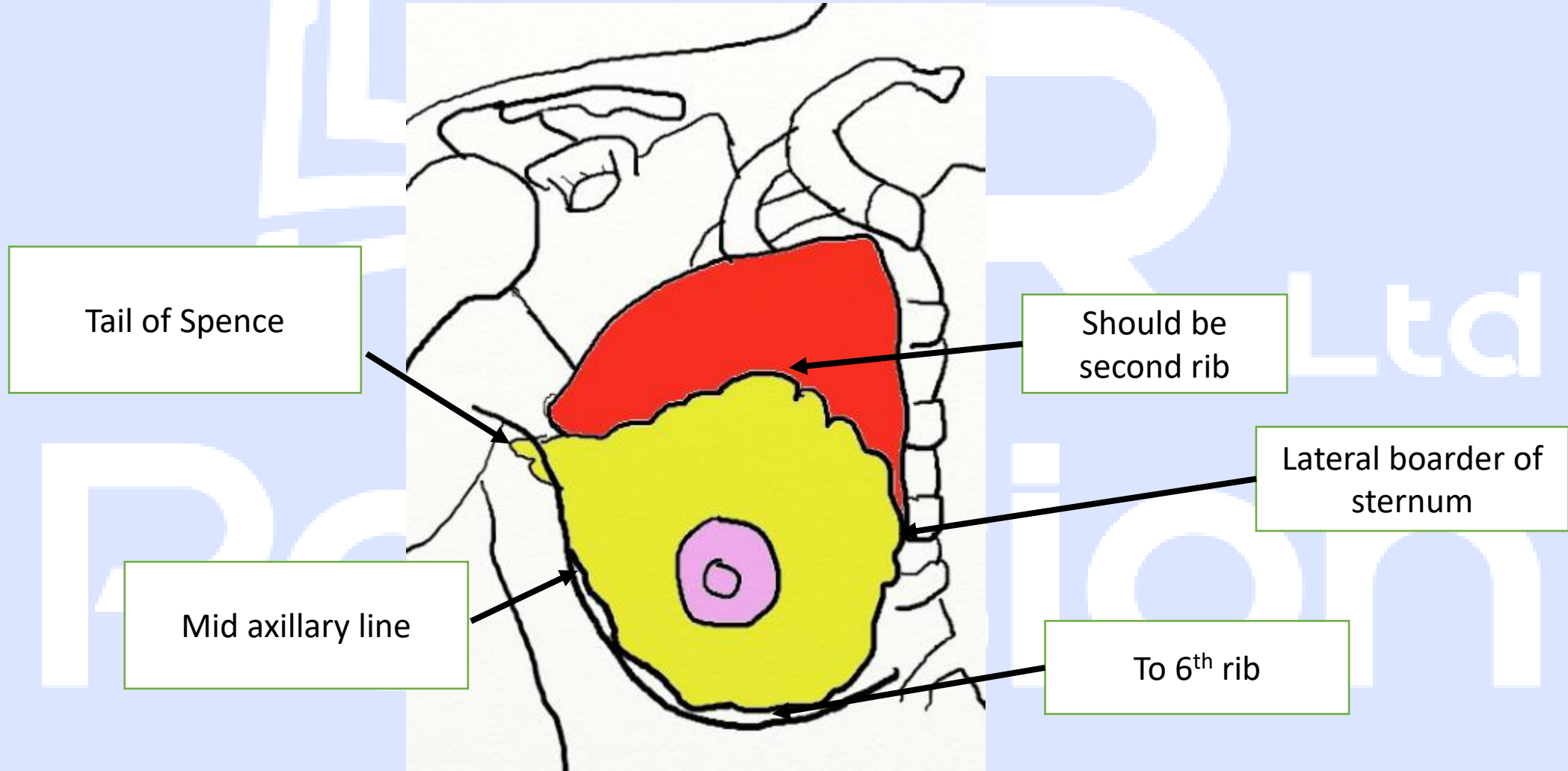
Risk factors for breast Ca

- Age >50
- Early onset of menstruation, late menopause,
- Older age at first completed pregnancy,
- Genetics - family history of breast cancer.
- Oral contraceptives or hormone replacement therapy (HRT).
- Obesity and alcohol consumption.
- Physical activity and breast-feeding protect against breast cancer.

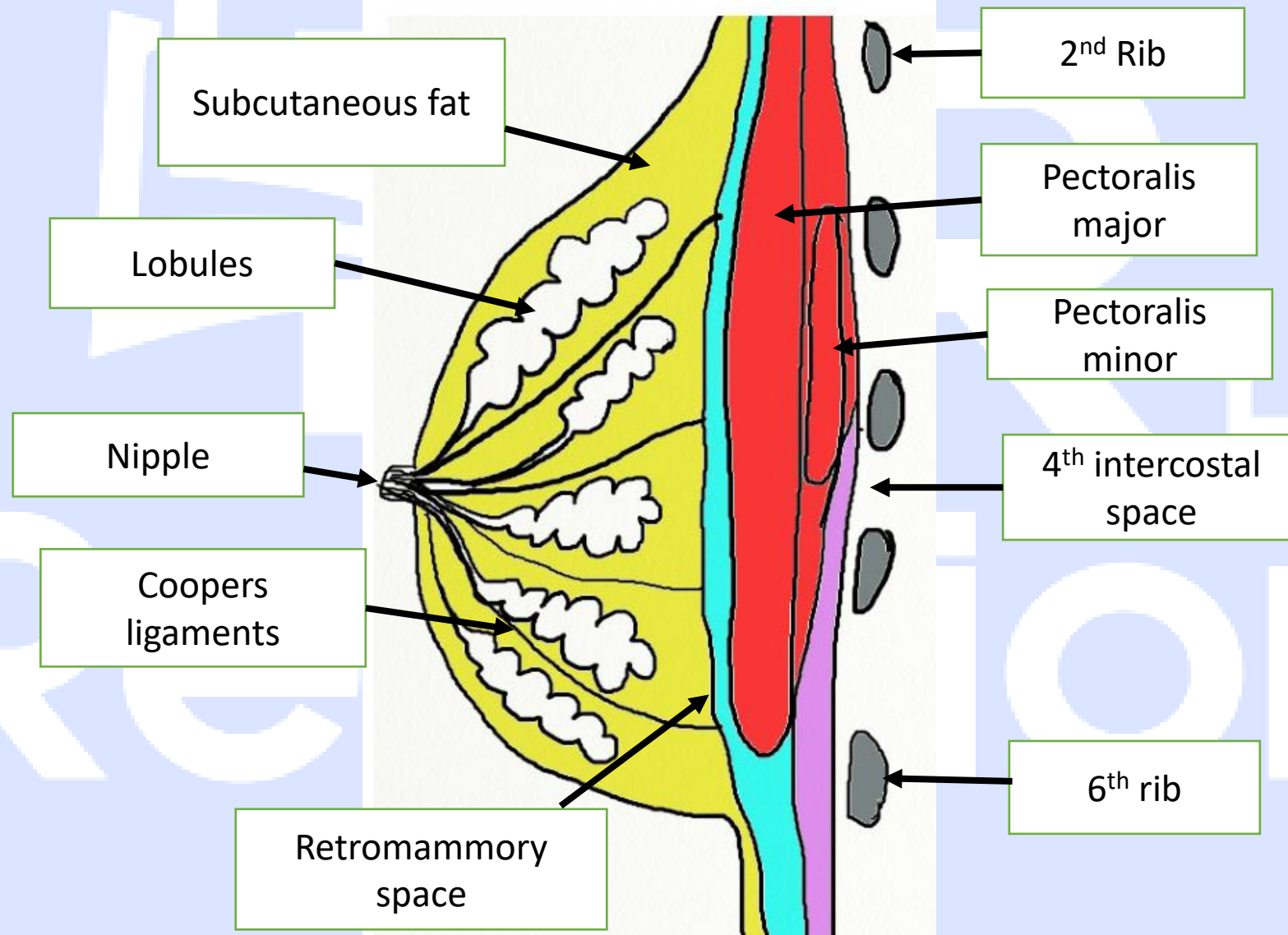
Men specifically

- Breast cancer in men rare,
- May be associated with abnormalities of sex hormone metabolism, including those caused by liver disease or testicular trauma,
- Obesity
- Genetic predisposition, BRCA etc
- Environmental risk factors such as industrial exposure to chronic heat.

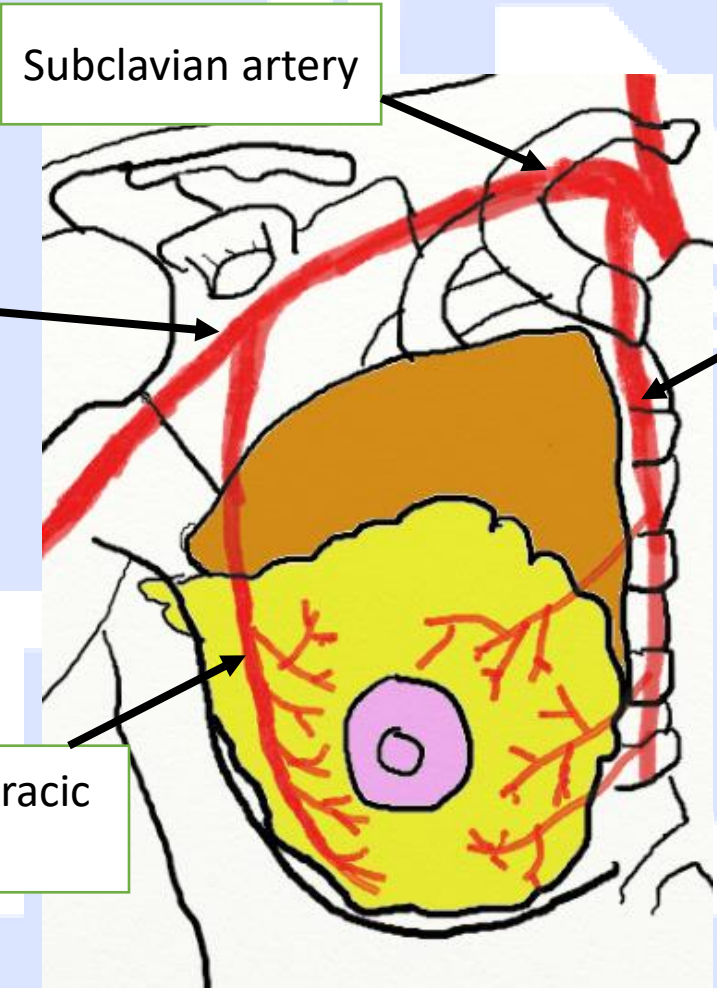
Position on the chest wall



Breasts – underlying structures



Breasts – blood supply

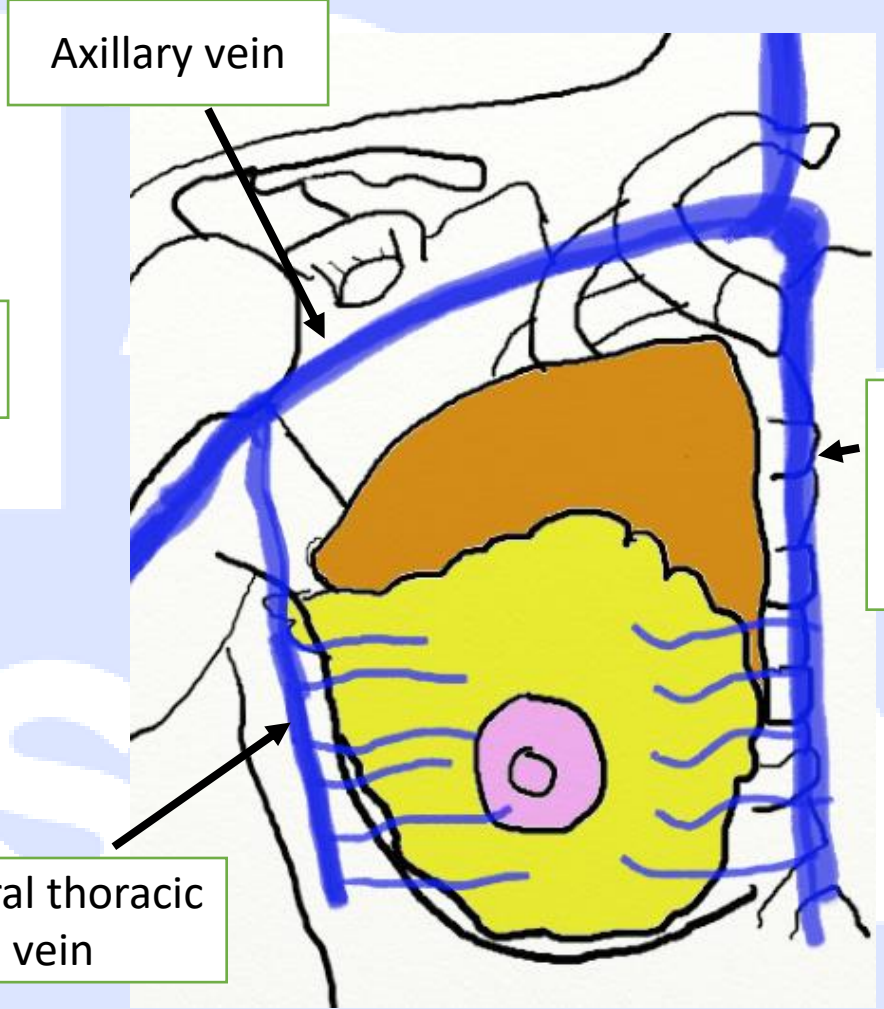


Subclavian artery

Axillary artery

Lateral thoracic artery

Internal thoracic artery

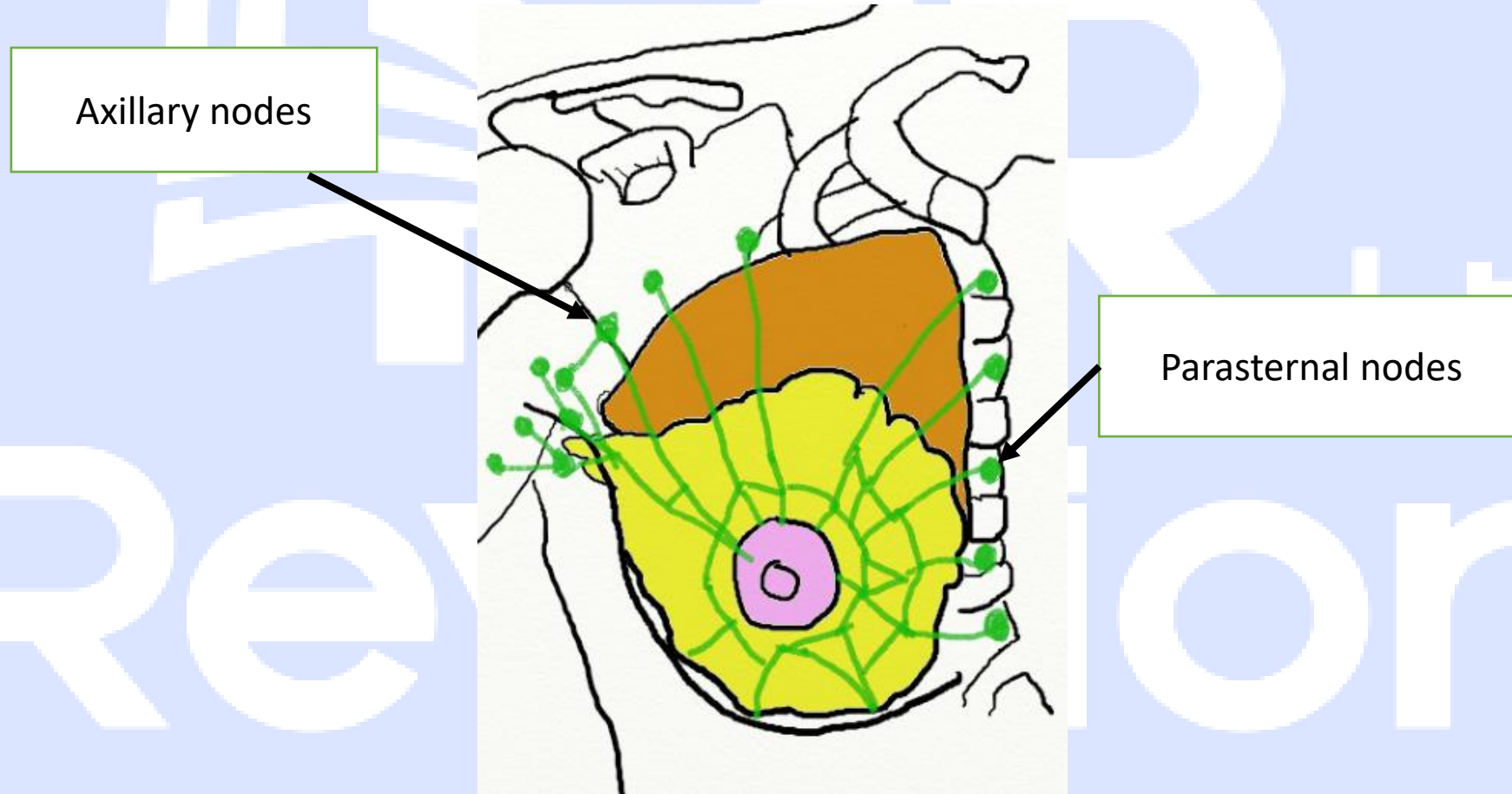


Axillary vein

Lateral thoracic vein

Internal thoracic vein

Breast – Lymphatic drainage



Breast Cancer Screening

- Screening from 50-70 years – mammogram every 3 years unless:
 - 1 x 1st degree female relative with breast cancer at \leq 40 years
 - 1 x 1st degree male relative with breast cancer at any age
 - 1 x 1st degree relative with bilateral breast cancer where the primary was diagnosed at \leq 50 years
 - 2 x 1st degree relatives, or 1x 1st degree and 1x 2nd degree relative, with breast cancer at any age
 - 1x 1st or 2nd degree relative with breast cancer at any age + 1 x 1st or 2nd degree relative with ovarian cancer at any age (one should be 1st degree)
 - 3 x 2nd degree relatives with breast cancer at any age
- Other risk factors:
 - Jewish ancestry
 - sarcoma in a relative younger than age 45 years
 - glioma or childhood adrenal cortical carcinomas
 - complicated patterns of multiple cancers at a young age

Breast screening continued

- Benefits of breast screening include:
 - Reduction in mortality.
 - More breast-conserving treatment due to an increase in early detection of breast cancer.
- Harms of breast screening include:
 - Over-diagnosis leading to unnecessary treatment.
 - False-positive mammograms, leading to unnecessary further investigations.
 - False reassurance, due to missed cancer and incorrect diagnosis.
 - Pain and discomfort, due to mammography.
 - Psychological distress, such as anxiety or uncertainty, for example following a false-positive result.
 - Radiation exposure, which may increase the risk of breast cancer.
- Women with breast implants should be informed that some of the breast tissue in women with implants is obscured by the radiopaque implant during routine mammography.
 - Additional screening images may be taken at the initial mammography appointment, to visualise as much breast tissue as possible to improve cancer detection rates.

Non-screen detected symptoms

- Breast lump is the most common presenting symptom.
- A malignant breast lump is usually painless, but pain can occur.
- Nipple symptoms, including change in shape or nipple bleeding, are recognized symptoms as are skin changes, such as tethering or peau d'orange.
- A diagnosis of breast cancer is generally made using mammography and core biopsy. This is performed in secondary care – **triple assessment**
- [[National Collaborating Centre for Cancer, 2015](#)]

Symptoms of breast cancer

Symptom	Referral recommendation
Axillary lump (unexplained), age 30 years and over	Consider a suspected cancer pathway referral (for an appointment within 2 weeks)
Breast lump (unexplained) with or without pain, age 30 years and over	Refer people using a suspected cancer pathway referral (for an appointment within 2 weeks)
Breast lump (unexplained) with or without pain, under age 30 years	Consider non-urgent referral
Nipple changes of concern (in one nipple only) including discharge and retraction, age 50 years and over	Refer people using a suspected cancer pathway referral (for an appointment within 2 weeks)
Skin changes that suggest breast cancer	Consider a suspected cancer pathway referral (for an appointment within 2 weeks)
Deep vein thrombosis (Several cancers including urogenital, breast, colorectal, or lung)	Carry out an assessment for additional symptoms, signs, or findings that may help to clarify which cancer is most likely Consider urgent investigation or a suspected cancer pathway referral (for an appointment within 2 weeks)

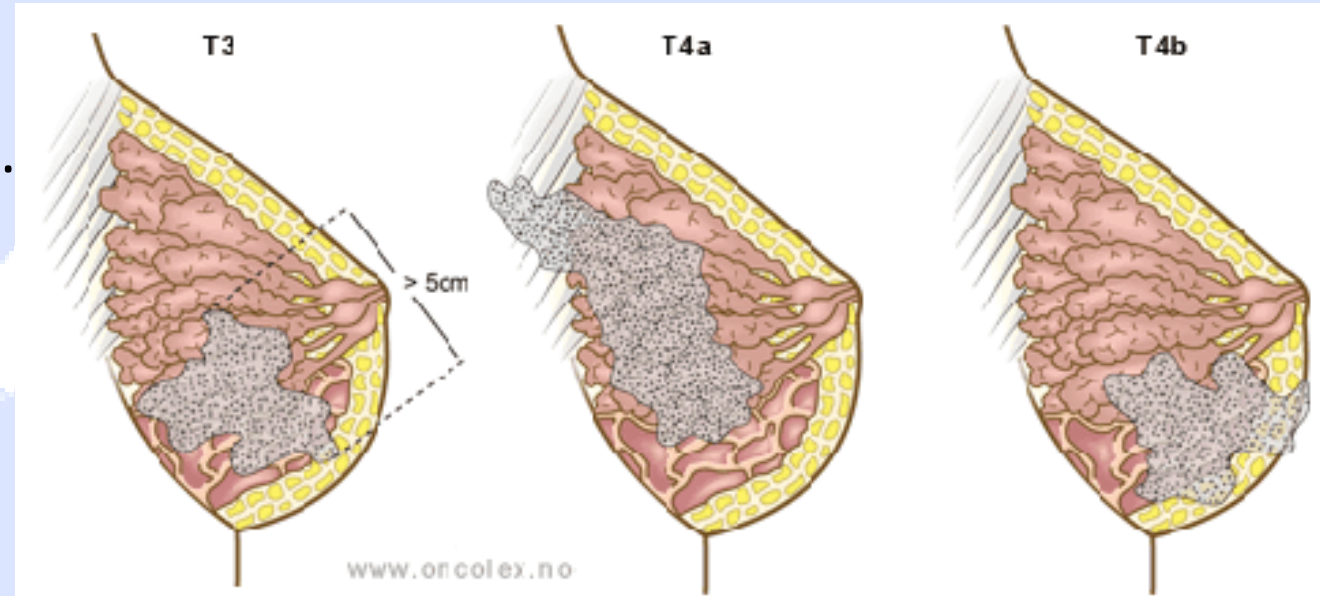
Data from: [[NICE, 2015](#)]

Breast cancer by anatomy

- Lobular:
 - LCIS technically not cancer, but marginally increased risk of cancer.
 - Pleomorphic LCIS – a lot more like DCIS in its cancerous ways
 - Invasive Lobular carcinoma – 2nd most common breast cancer (15%), tends to affect women 45-55y. Tends not to present as a lump as much as a thickened area, nipple or skin changes.
- Ductal:
 - DCIS – cancer but localised within ducts, may have multi-focal DCIS, low, intermediate and high grade. Usually screen detected, but may present as a lump, bleeding from nipple or Paget's disease.
 - Invasive breast cancer non-special type – the cells have no special type but generally comes from the ducts. Often screen detected, but can be a lump, skin puckering etc.
- Inflammatory breast cancer:
 - Cancer of the breast lymphatics, which leads to a swollen tender breast, with tension along Cooper's ligaments.
 - No lump
 - Rare but aggressive

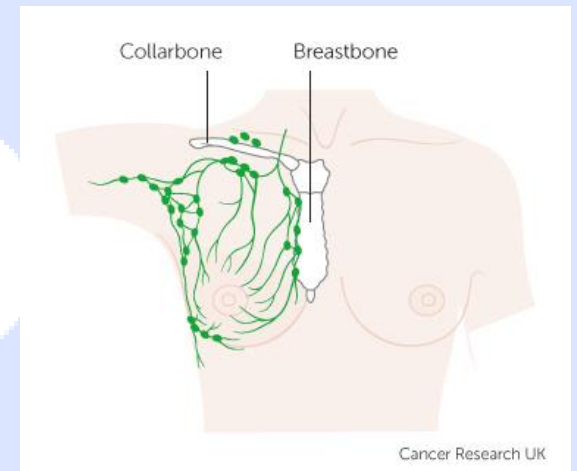
TNM staging breast cancer – Don't Get bogged down!

- TX = tumour size can't be assessed.
- Tis (DCIS).
- Tis (Paget)
- T1 = tumour \leq 2cm.
- T2 = 2 – 5cm.
- T3 >5cm
- T4a = tumour spread into chest wall
- T4b = tumour spread into skin +/- swelling.
- T4c = tumour spread to both skin and chest wall
- T4d = inflammatory carcinoma – this is a cancer in which the overlying skin is red, swollen and painful (not same thing as inflammatory breast cancer per se)



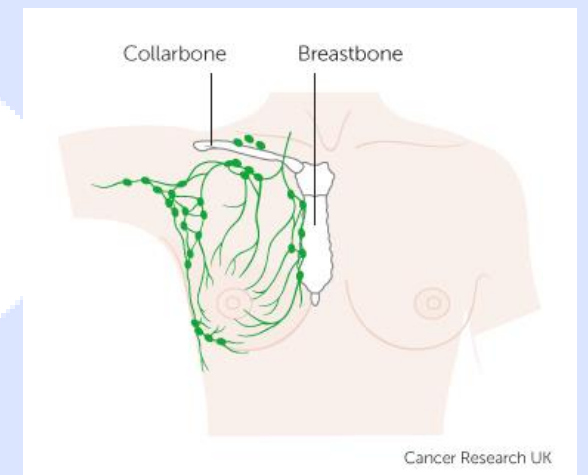
TNM staging breast cancer – Don't Get bogged down!

- pNX = LN not assessed (eg prev dissection).
- pNO = no cancer cells or only isolated tumour cells (ITCs = small clusters of cancer cells <0.2 mm across, or a single tumour cell, or a cluster of <200 cells in one area of a LN = LN neg).
- pN1mi = \geq 1 LN has micromets >0.2mm, or >200cells but <2mm
- pN1a = 1-3 LN mets >2mm.
- pN1b = internal mammary nodes on SLNB positive.
- pN1c = 1-3 LN pos axilla + internal mammary nodes.



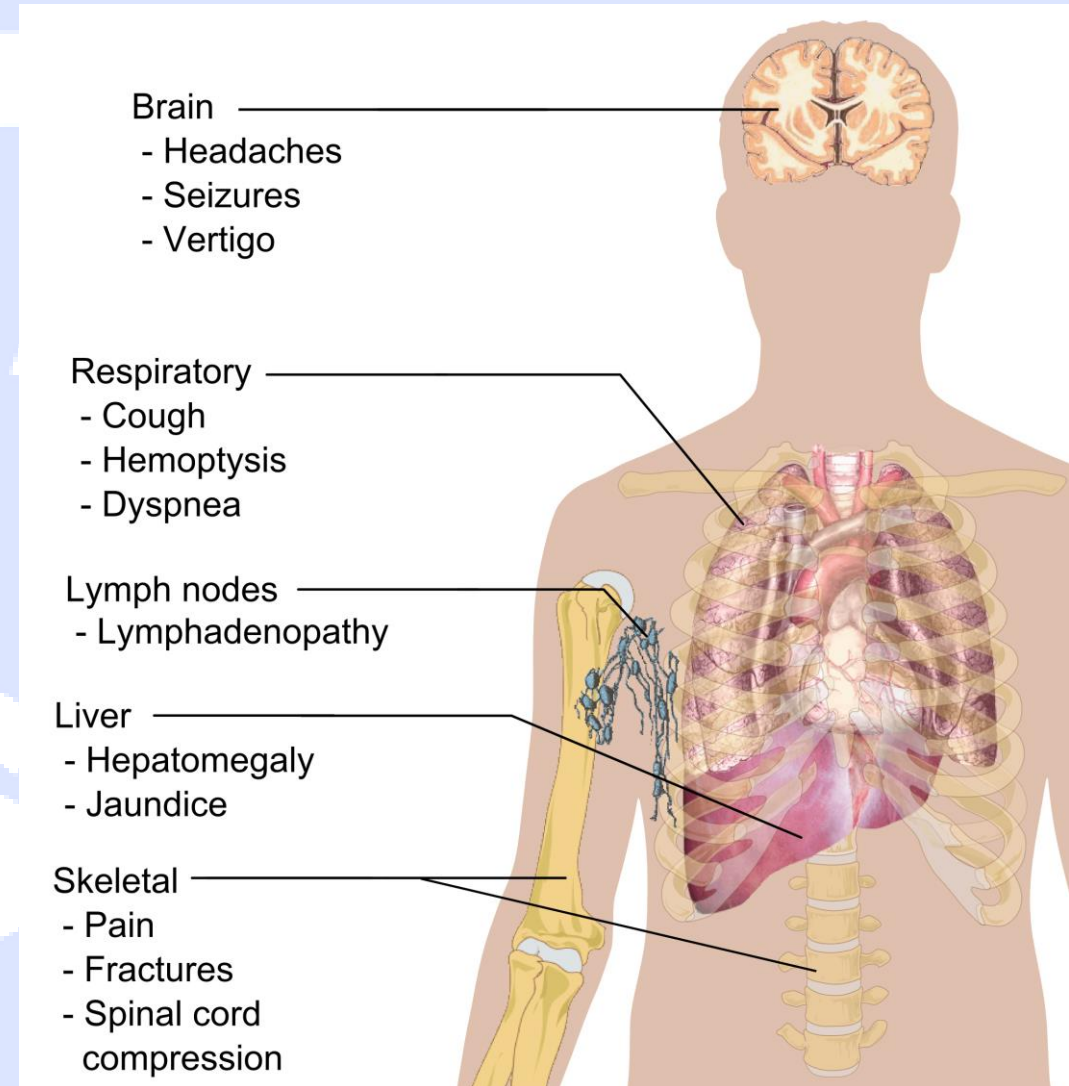
TNM staging breast cancer – Don't Get bogged down!

- pN2a = 4-9 LN pos in axilla with ≥ 1 LN >2 mm.
- pN2b – palpable or scan detected internal mammary LN, but axilla clear.
- pN3a = ≥ 10 axillary LN pos and ≥ 1 >2 mm or supraclavicular node pos.
- pN3b = LN axilla and internal mammary positive.
- pN3c = supraclavicular node positive.



TNM staging breast cancer – Don't Get bogged down!

- M0 = no sign of spread.
- cMo(i+) = No sign of spread on physical examination, scans or x-rays. But cancer cells found in blood, bone marrow, or lymph nodes away from the breast cancer.
- cM1 = Metastases detected clinically or by scan.
- pM1 = Metastases >0.2mm confirmed by biopsy, or scans.
- Metastases usually to liver, lung, brain or bone



Hormones in breast cancer

- Most breast cancers are oestrogen receptor positive
- Some are progesterone receptor positive
- Some are human epidermal growth receptor 2 (Her-2) receptor positive
- Some are not positive for any of the above, and are therefore triple negative breast cancers. These have the worst prognosis as no hormonal therapy will work. Association with BRCA-1

Drugs

- Tamoxifen for ER positive patients pre- and peri- menopausal,
- Letrozole – Post menopausal women
 - First-line treatment with hormone-dependent advanced breast cancer
 - Adjuvant treatment of oestrogen-receptor-positive invasive early breast cancer
 - Advanced breast cancer (naturally or artificially induced menopause) in whom other anti-oestrogen therapy has failed,
 - Extended adjuvant treatment of hormone-dependent invasive breast cancer in women who have received standard adjuvant tamoxifen therapy for 5 years,
 - Neo-adjuvant treatment in women with localised hormone-receptor-positive, human epidermal growth factor-2 negative breast cancer where chemotherapy is not suitable and surgery not yet indicated

Other drugs

- Trastuzumab (Herceptin) – part of a wider chemo regime, especially for Her-2 positive women
- Bisphosphonates -
 - Zoledronic acid and sodium clodronate shown to improve disease-free survival and overall survival in postmenopausal women with node-positive invasive breast cancer.
 - IV zoledronic acid or oral sodium clodronate should be offered to postmenopausal women with lymph-node-positive invasive breast cancer. Treatment should be considered in those with lymph-node-negative invasive breast cancer who are at high-risk of recurrence.
 - Bisphosphonate therapy is also recommended in women at high-risk of osteoporosis due to the use of aromatase inhibitors in postmenopausal women, or in women with treatment-induced premature menopause.

Surgical

- with or without radiotherapy to reduce local recurrence rates.
- often followed by adjuvant drug therapy to eradicate the micro-metastases that cause relapses.
- Tends to be oncoplastic rather than just oncological procedure given the trauma that women feel in the process.
- Have to consider the whole patient and their fitness for surgery
- May be palliative

Which surgery?

- Most cancers can be removed by WLE:

- Consider cosmesis
- Location of tumour (s)
- DCIS size of group

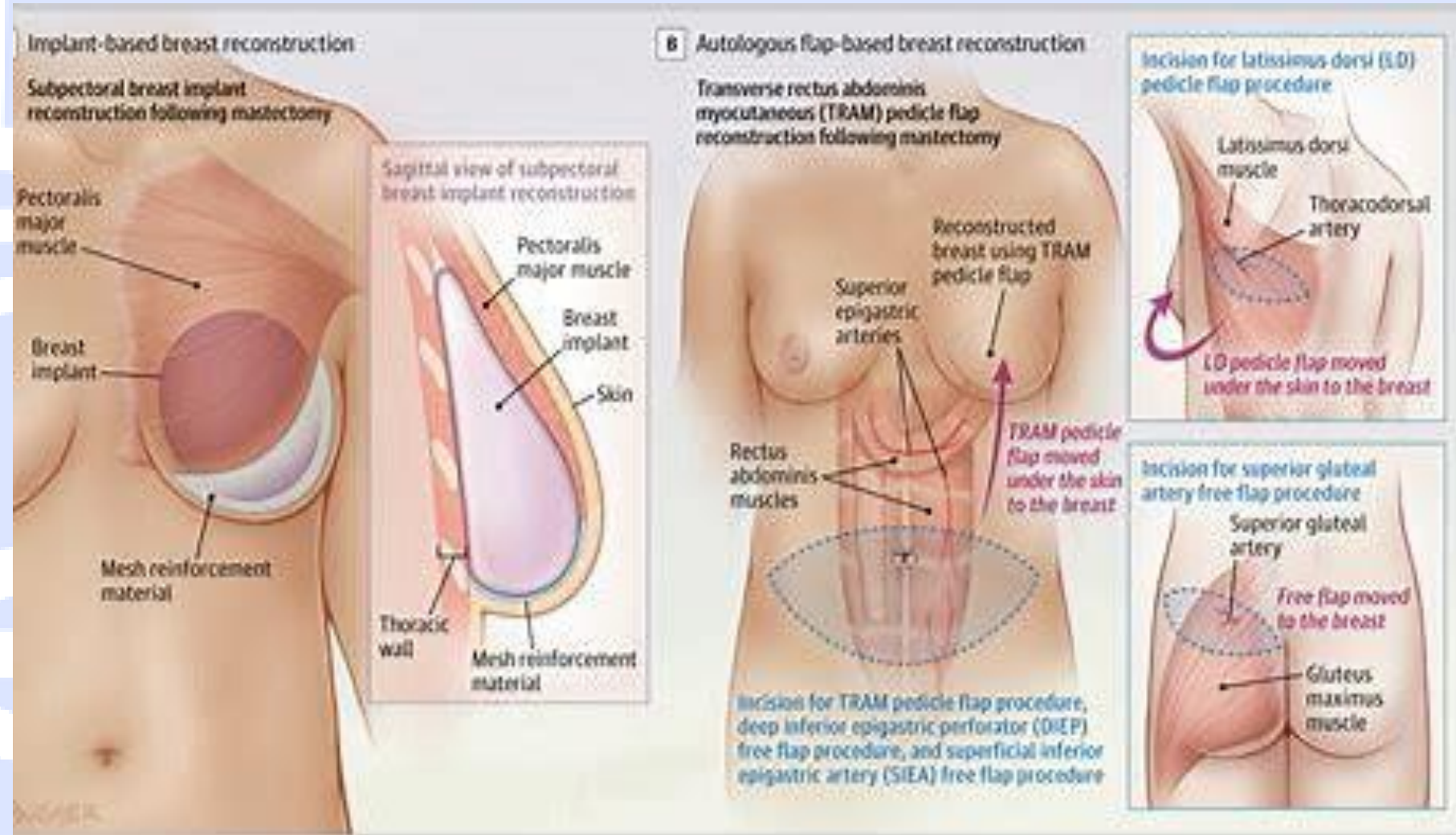


- Axilla

- SLNB in people with invasive cancer but no clinical or radiological evidence of LN involvement using dual technique.
- In DCIS SLNB if requires mastectomy or high risk
- Discuss axillary clearance / radiotherapy if macromets.

Reconstruction

- Immediate or delayed
- Reduction / replacement
- Tissue vs implant
- Nipple reconstruction

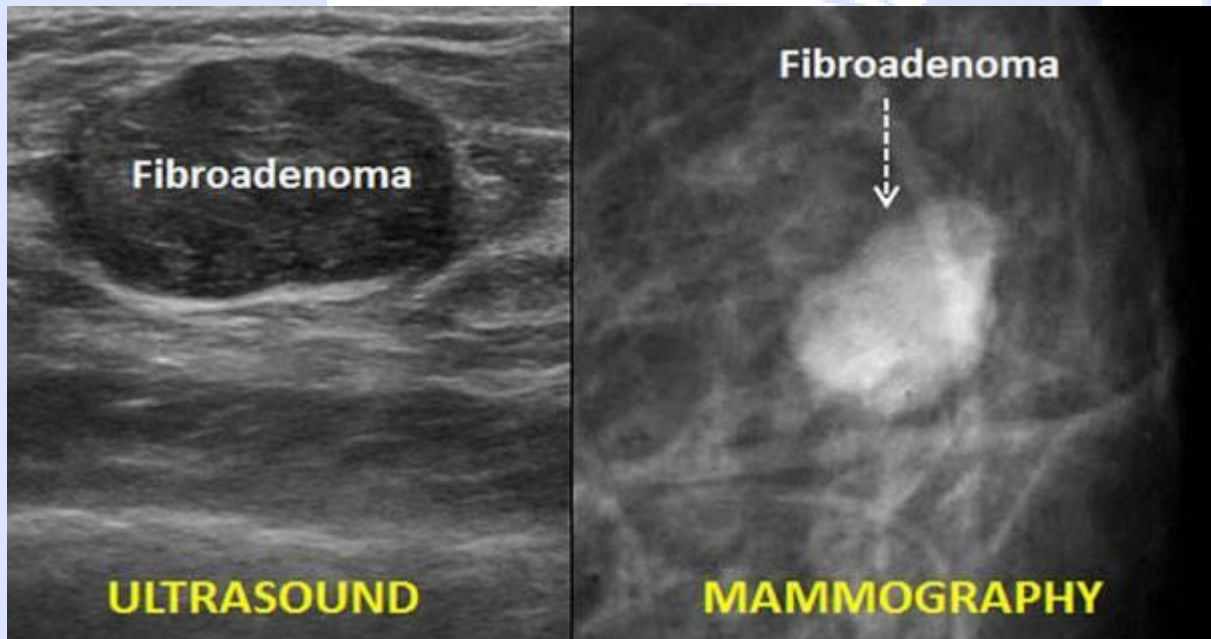


Radiotherapy

- Can be whole breast and axilla, or partial breast.
- Want to avoid too much radiation going through to the heart and lungs, and patients tend to want to breathe
- Consider omitting 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.

Benign breast conditions

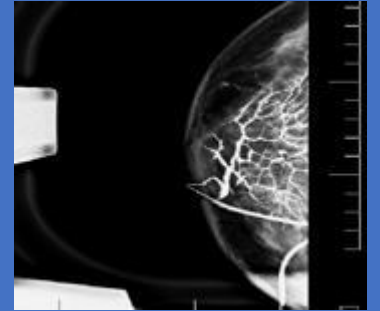
- Fibroadenoma – breast mouse, hormone dependent lump in women <35y



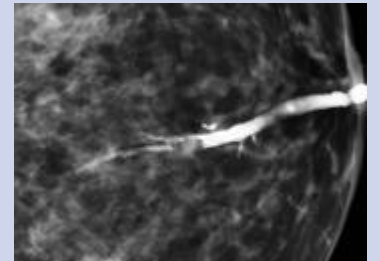
Benign breast conditions

- Ductal papilloma – hyperplastic, but blood stained discharge so gets investigated
- Duct ectasia – milk duct widens, walls thicken and sometimes accumulates some fluid, which may later be expelled – typically green. Can progress to periductal mastitis

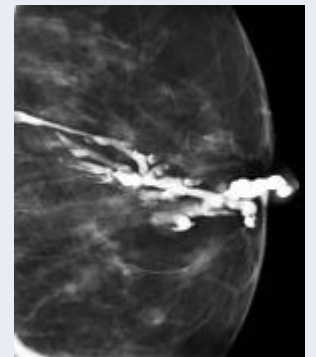
Normal



Filling defect in papilloma



Duct ectasia



Benign breast conditions

- Periductal mastitis – form of non-lactational mastitis, tender and need Abx, usually settles with warm compress. Tends to be perimenopausal women, smoking a significant risk factor, can develop fistulae.



Benign breast conditions

- Mastitis –
 - typically trauma related,
 - painful infection of the breast, commonly but not always with breast feeding.
 - Often wedge shaped cellulitis,
 - can have pus and blood stained discharge.
 - Needs Abx, if systemically unwell may require IV Abx.



Summary and conclusions

- Most common cancer for women in the UK currently
- Generally good long term prognosis depending upon progression at time of diagnosis.
- Oestrogen most common factor for increasing risk of breast cancer.
- Treatments balanced against risks
- Most surgery now oncoplastic
- Often investigate benign conditions.