

Epidemiology

- Most common cancer in Females in Jordan
- Incidence 2500 cases per year
- Second most common cause of cancer death in women.
- Early diagnosis and treatment is associated with increased chances of cure, better prognosis and improved over all survival

Screening

Screening	Age (years)	Frequency
Mammogram	Over 40	Annually
Clinical breast exam	Over 20	Every 3 years
	Over 40	Annually
Self-breast exam (Optional)	Over 20	Monthly

Risk factors

Age

Gender (100:1)

White race

Obesity (BMI >30)

Exogenous hormones

Reproductive factors.

Previous suspicious breast biopsy

Personal history of breast cancer

Family history of breast cancer

 one first-degree relative 2x

 2 first degree relatives 3x

Inherited genetic mutations

 only 5-6% of all breast cancers are directly attributable to inheritance of a breast cancer susceptibility gene such as BRCA1, BRCA2, p53

Lifestyle factors

 Alcohol

 Smoking

 Exposure to therapeutic ionizing radiation.

70% of women have no risk factors!

Presenting Symptoms

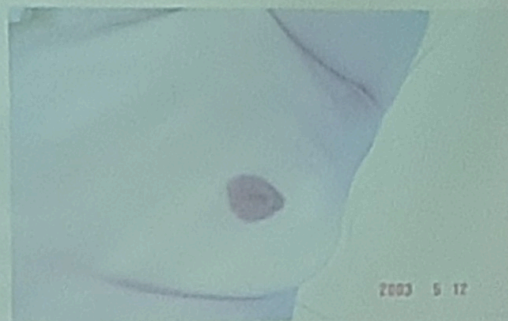
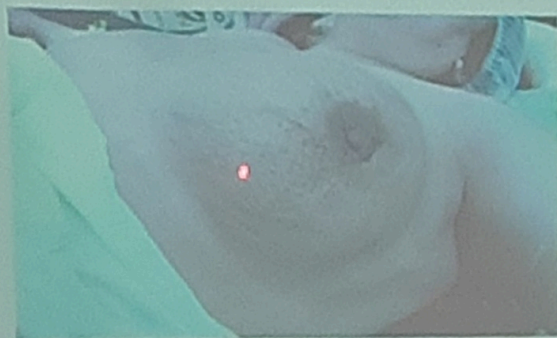
- Age
- Painless lump
- Axillary lump
- Skin dimpling
- The nipple retracted or destroyed.
- The breast changed shape feel hard.
- Backache
- Pathological fracture
- Symptoms from cerebral, lung or abdominal deposits
- Malaise and weight loss, **are not found** in patients with breast cancer

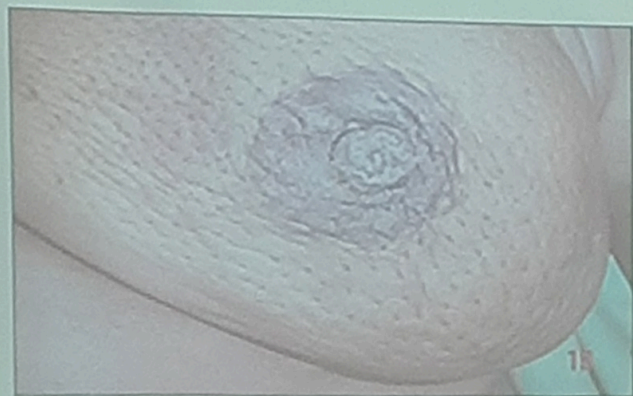
Physical examination

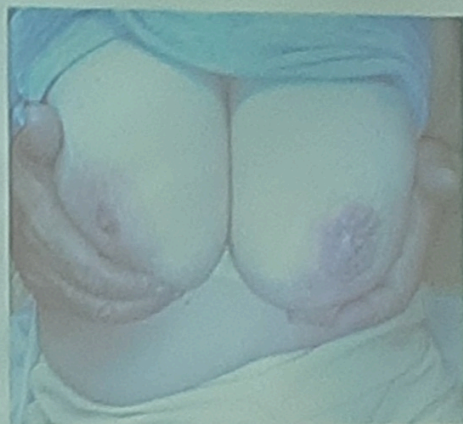
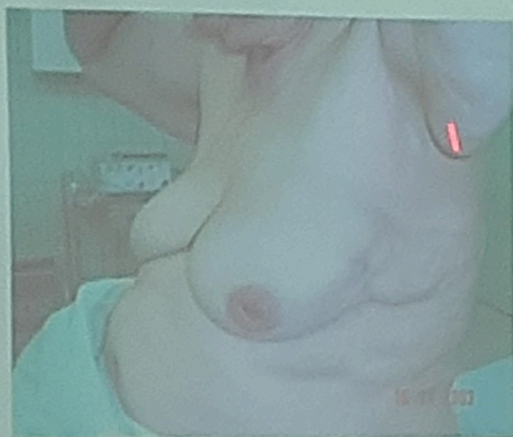
- **Site**
- **Tenderness**
- **Shape**
- **Surface**
- **Consistency**
- **Relations to surrounding structures**
- **Axilla**
- **General examination**

Malignant Masses

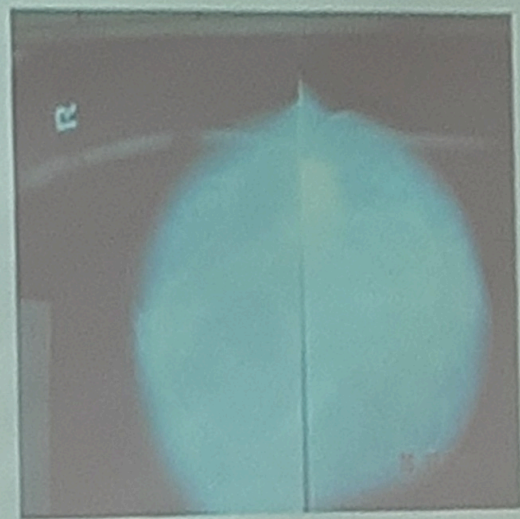
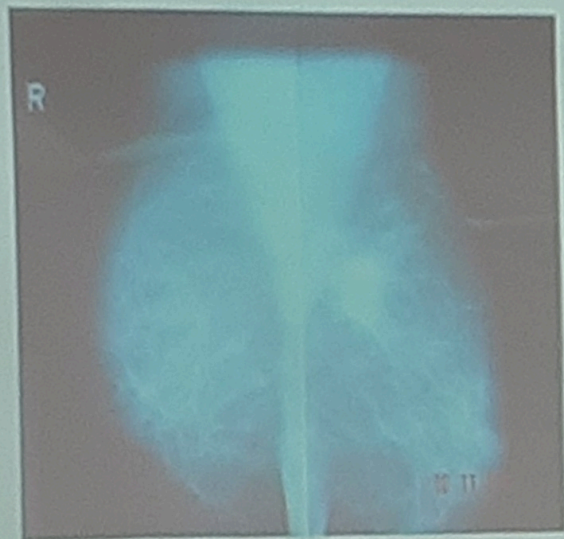
- Hard.
- Painless: Malignant masses painful in only 10-15% of patients.
- Irregular.
- Skin Dimpling.
- Nipple Retraction.
- Bloody or Water Discharge.
- Possibly fixed to the skin or chest wall

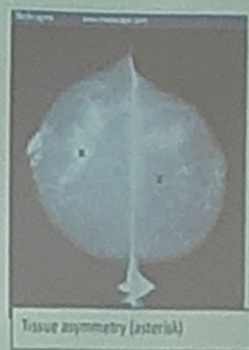
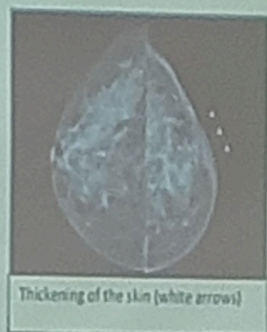
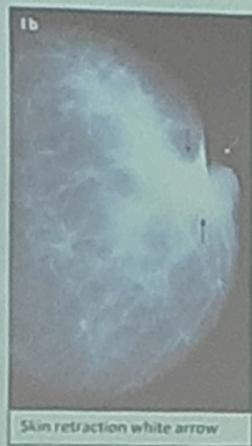


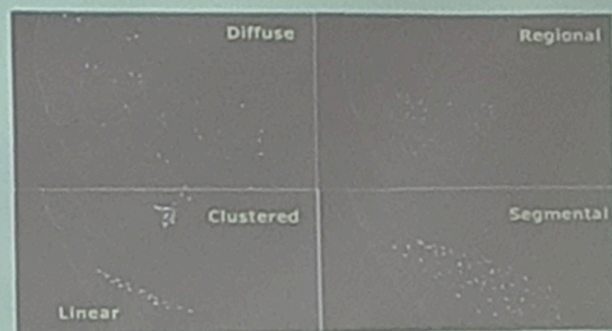
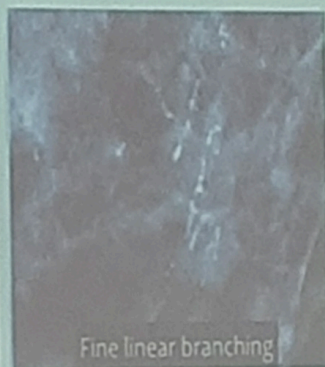
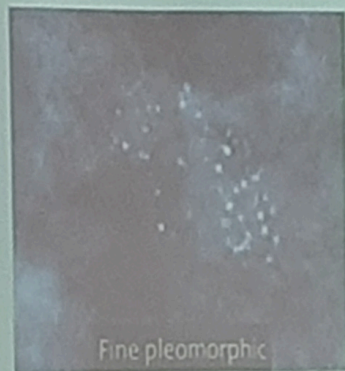




Mammogram







BI-RADS mammographic assessment categories

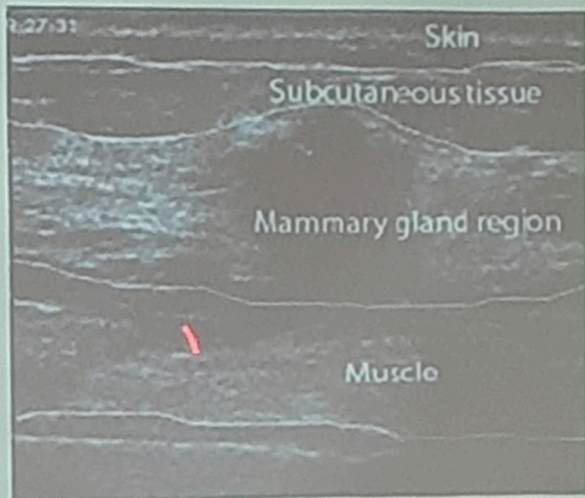
Assessment category	Recommendation	Probability of malignancy
0: Incomplete	Need for further evaluation	Not applicable
1: Normal	Normal interval follow-up	0 percent
2: Benign	Normal interval follow-up	0 percent
3: Probably benign	A short interval follow-up is recommended	<2 percent
4: Suspicious abnormality	A biopsy should be considered	≥2 to <95 percent (a) Low-risk (b) Intermediate-risk (c) Moderate to high-risk
5: Highly suggestive of malignancy	Biopsy or surgery should be performed	≥95 percent
6: Biopsy-proven carcinoma	Appropriate action should be taken	

BI-RADS: Breast Imaging Reporting and Data System.

Source: Breast Imaging Reporting and Data System (BI-RADS) Atlas, 4th Edition. American College of Radiology, Reston, VA, 2003.

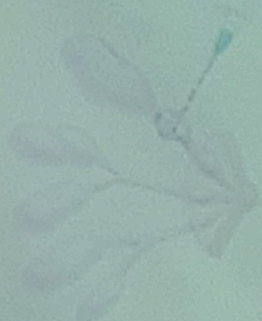
Ultrasound

- Ultrasound is useful in the assessment of breast lumps
- Complements mammography and is able to differentiate solid and cystic lesions
- Also able to guide fine needle aspiration and core biopsies
- Can be used to assess tumour size and response to therapy
- In the diagnosis of malignancy it has a sensitivity and specificity of 75% and 97% respectively
- Cysts and solid lesions have typical appearances

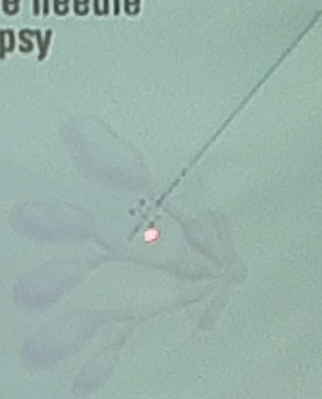


Biopsy

Fine-needle aspiration



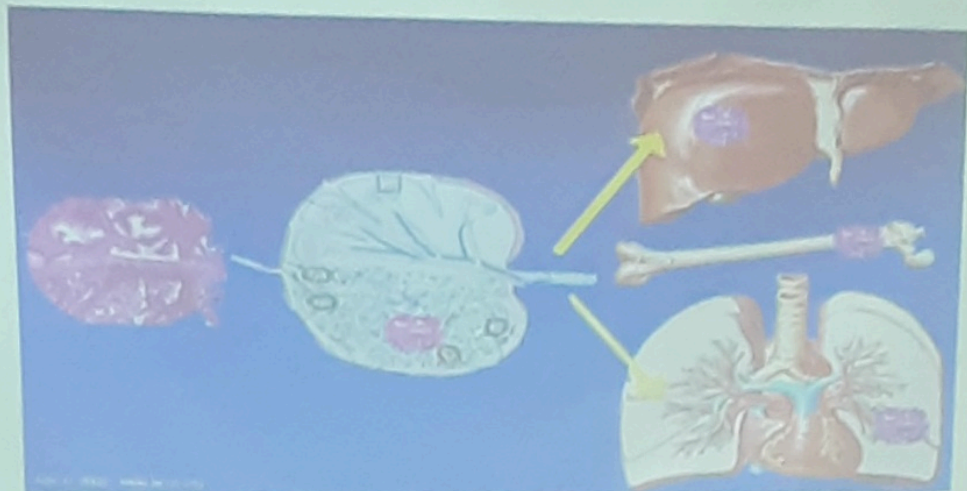
Core needle biopsy



Open biopsy



Staging



- CBC count with differential and platelet count
- Chemistry and renal function studies
- Liver function tests
- Tumor markers CA 15.3



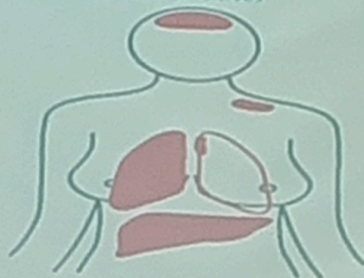
Stage 1
Early disease; tumour confined
to the breast (node-negative)



Stage 2
Early disease; tumour spread to
movable ipsilateral axillary
node(s) (node-positive)



Stage 3
Locally advanced disease; tumour
spread to the superficial structures
of the chest wall; involvement of
ipsilateral internal mammary lymph
nodes



Stage 4
Advanced (or metastatic) disease;
metastases present at distant sites,
such as bone, liver, lungs and brain
and including supraclavicular lymph
node involvement

- Tx – Primary tumor is unable to be assessed.
- T0 – No evidence of primary tumor.
- Tis – Carcinoma in situ.
- T1 – Tumor ≤ 20 mm in greatest dimension.
- T2 – Tumor > 20 mm but ≤ 50 mm in greatest dimension.
- T3 – Tumor > 50 mm in greatest dimension.
- T4 – Tumor of any size with direct extension to the chest wall and/or the skin.

- N
- cNX – Regional lymph nodes cannot be assessed.
- cN0 – No regional lymph node metastases.
- cN1 – Metastasis to movable ipsilateral level I, II axillary lymph nodes(s).
- cN2 – Metastasis to ipsilateral level I, II axillary lymph nodes that are clinically fixed or matted; or in ipsilateral internal mammary nodes in the absence of clinically evident axillary 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 clinically evident level I, II axillary lymph node metastases; or metastases in ipsilateral supraclavicular lymph node(s) with or without axillary or internal mammary lymph node involvement.

- M
- M0 – No clinical or radiographic evidence of distant metastases.
- M1 – Distant detectable metastases as determined by classic clinical and radiographic means and/or histologically proven metastases larger than 0.2 mm.

Breast carcinoma TNM anatomic stage group AJCC UICC 8th edition

When T is...	And N is...	And M is...	Then the stage group is...
Tis	N0	M0	0
T1	N0	M0	IA
T0	N1mi	M0	IB
T1	N1mi	M0	IB
T0	N1	M0	IIA
T1	N1	M0	IIA
T2	N0	M0	IIA
T2	N1	M0	IIB
T3	N0	M0	IIB
T0	N2	M0	IIIA
T1	N2	M0	IIIA
T2	N2	M0	IIIA
T3	N1	M0	IIIA
T3	N2	M0	IIIA
T4	N0	M0	IIIB
T4	N1	M0	IIIB
T4	N2	M0	IIIB
Any T	N3	M0	IIIC
Any T	Any N	M1	IV

**Invasive Breast
Cancer**

**Early-Stage
Disease**

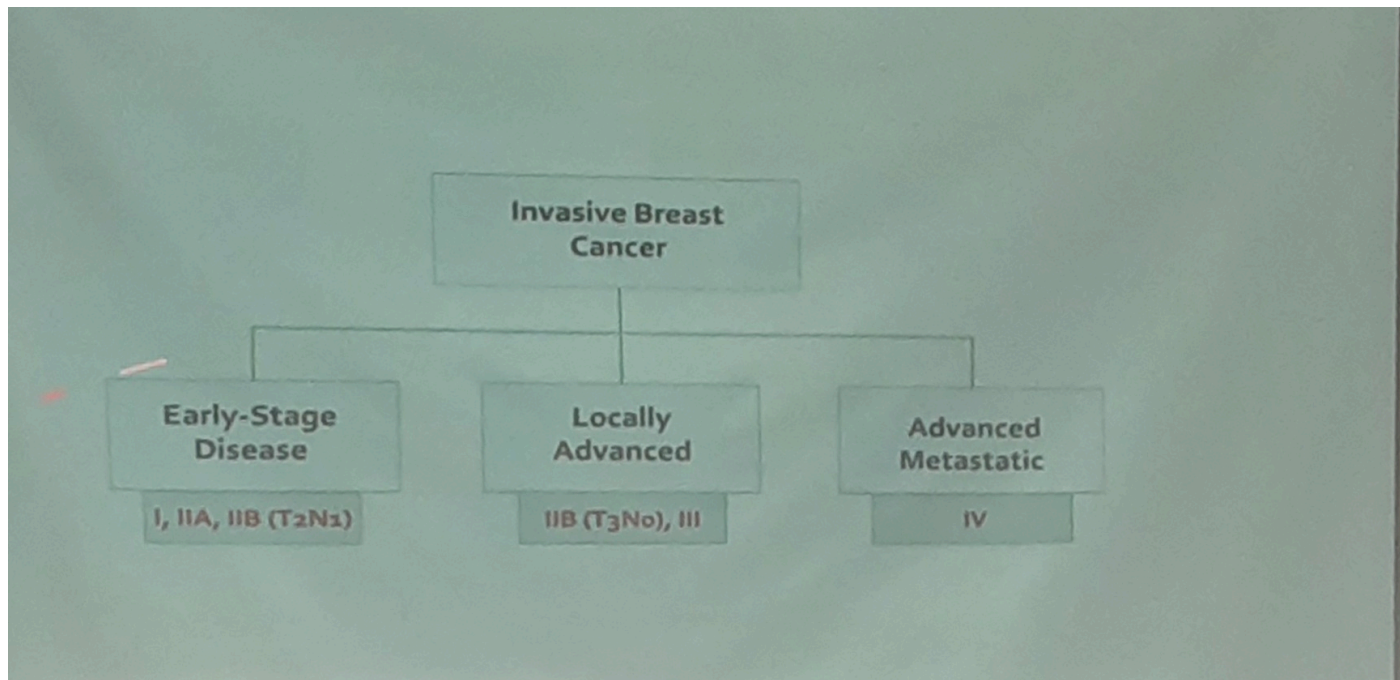
I, IIA, IIB (T₂N₁)

**Locally
Advanced**

IIB (T₃N₀), III

**Advanced
Metastatic**

IV



5-year relative survival rates for breast cancer by stage

- The 5-year relative survival rate for women with stage 0 or stage I breast cancer is close to 100%.
- For women with stage II breast cancer, the 5-year relative survival rate is about 93%.
- The 5-year relative survival rate for stage III breast cancers is about 72%. But often, women with these breast cancers can be successfully treated.
- Breast cancers that have spread to other parts of the body are more difficult to treat and tend to have a poorer outlook. Metastatic, or stage IV breast cancers, have a 5-year relative survival rate of about 22%. Still, there are often many treatment options available for women with this stage of breast cancer.

BREAST CANCER TREATMENT MODALITIES

Surgery

**Local
Approach**

**Systemic
Approach**

**Targeted
Therapy**

**Radiation
Therapy**

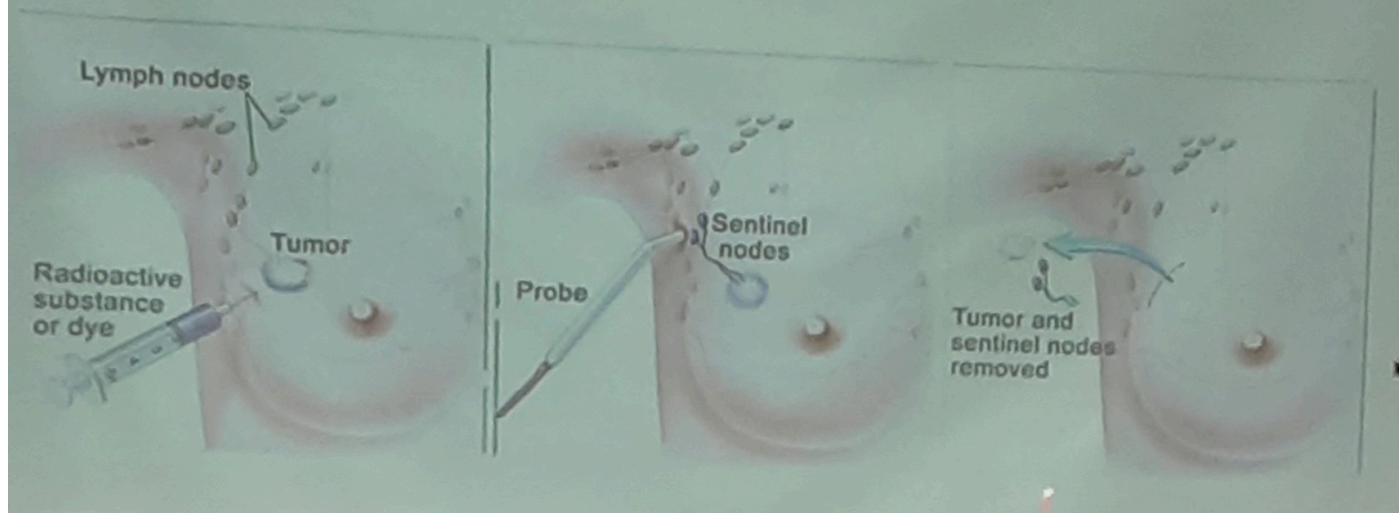
**Chemo
Therapy**

**Hormonal
Therapy**

Surgery

- Breast Conserving Surgery (BCS)
- Mastectomy.
- Breast Reconstructive Surgery

Sentinel Lymph Node Biopsy (SNLB)



Contraindications to do BCT

- Large tumor-to-breast ratio.
- Multifocal tumors.
- Fixation to the chest wall.
- Excision with negative tumor margins (> 2 mm) not guaranteed.
- Clustered microcalcifications on imaging.
- Involvement of the skin or nipple.
- A history of chest radiation.

Radiation Therapy

- Adjuvant radiation therapy is considered a routine after **breast conserving surgery** to prevent recurrence in the breast.
- It may be used after **mastectomy** to prevent recurrence on the chest wall and axilla.
- It is generally given 5 days a week over a 5- or 6- week time span.
- The only visual changes with breast radiation are skin erythema and possibly some transient lymphedema.

Chemotherapy

- Tumor size
 - Positive lymph nodes
 - Aggressive tumor histology
 - Triple negative breast cancer
-
- Systemic adjuvant chemotherapy is never recommended for non-invasive, in situ cancer (DCIS).

Hormonal Therapy:

- Hormone adjuvant therapy helps to prevent recurrence by blocking the effects of estrogen, which is known to stimulate cancer cell growth.
- It is most effective in women whose primary tumor has hormone receptors.
- **Tamoxifen** is the standard first choice of most experts.
- Other hormonal therapeutic agents include aromatase inhibitors. Examples of this class include anastrozole, **letrozole**, and exemestane.

Targeted Therapy

- Biological adjuvant therapy includes **trastuzumab**.
- It blocks the action of a growth promoting protein called Her-2.neu that is found in larger than normal amounts in about 30% of breast cancers.