



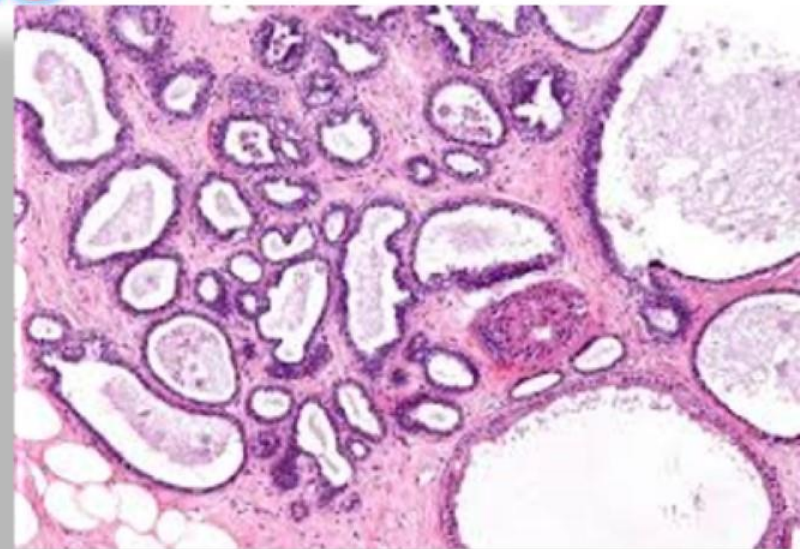


# Histopathology Assessment, Specimen Requirement and Histology Grading for Breast Cancers

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# OUTLINE OF PRESENTATION

1. Importance of Histopathology in Breast Cancers
2. Difference between Histology and Cytology
3. Latest WHO classification of Breast Tumors
4. Specimen Requirement/Protocols for Histopathology Specimen.
5. How Grading of the breast cancer is done?
6. Most common Breast Cancer Types
7. Take Home Message
8. Brain-Storming Question-Answers

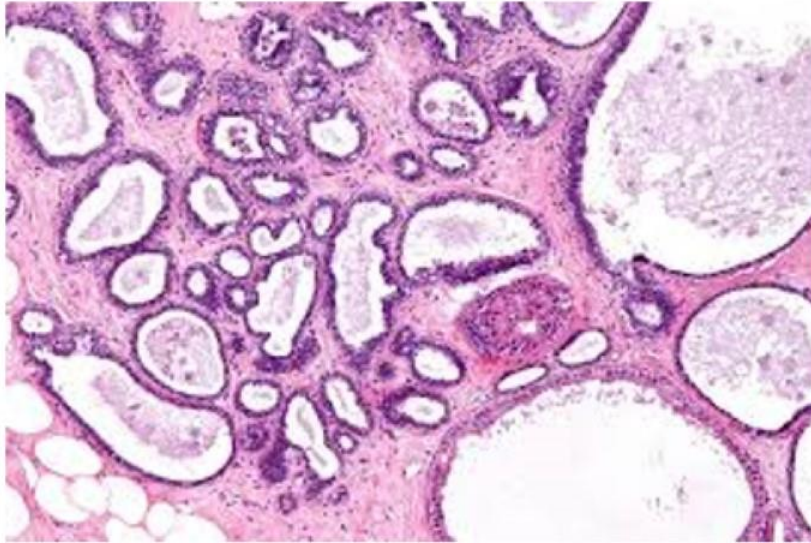


# 1. Importance Of Histopathology In Breast Cancers

Then please ask an  
Oncologist!

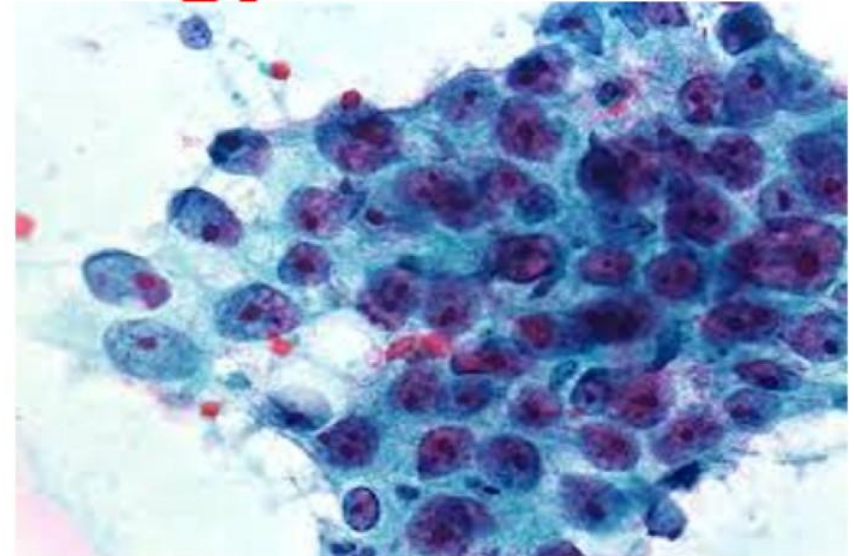


## 2. Difference between Histology and Cytology



### HISTOLOGY

- Study of tissues
- Complex
- Costly
- Needs experienced Histopathologist
- Can be reported in 5-10 days



### CYTOLOGY

- Study of cells
- Simple
- Cheaper
- High sensitivity
- Needs experienced cytopathologist
- Can be reported in 12-24 hours

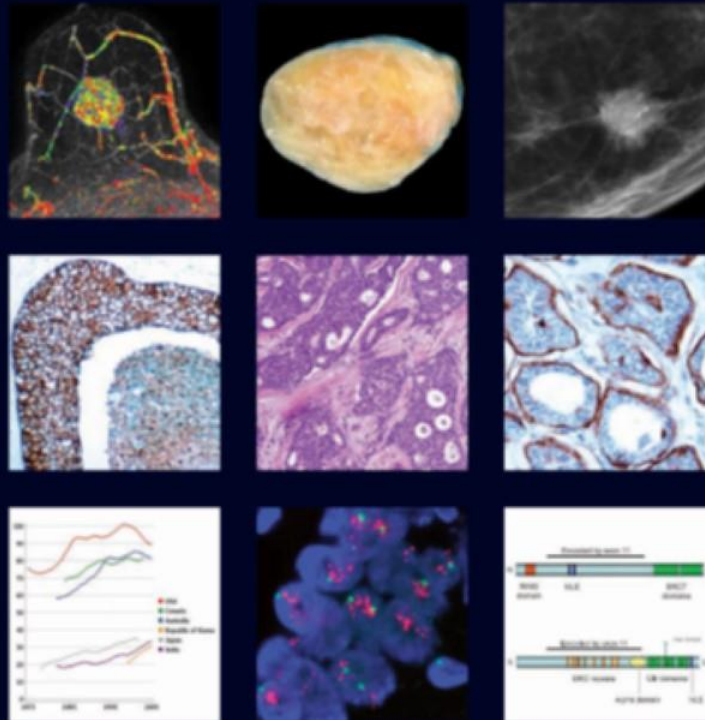


### 3. Latest WHO classification of



#### WHO Classification of Tumours of the Breast

Edited by Sunil R. Lakhani, Ian O. Ellis, Stuart J. Schnitt, Puay Hoon Tan, Marc J. van de Vijver



# WHO classification of tumours of the breast

## EPITHELIAL TUMOURS

### Microinvasive carcinoma

### Invasive breast carcinoma

Invasive carcinoma of no special type (NST) 8500/3

Pleomorphic carcinoma 8022/3

Carcinoma with osteoclast-like stromal giant cells 8035/3

Carcinoma with choriocarcinomatous features

Carcinoma with melanotic features

Invasive lobular carcinoma 8520/3

Classic lobular carcinoma

Solid lobular carcinoma

Alveolar lobular carcinoma

Pleomorphic lobular carcinoma

Tubulolobular carcinoma

Mixed lobular carcinoma

Tubular carcinoma 8211/3

Cribiform carcinoma 8201/3

Mucinous carcinoma 8480/3

Carcinoma with medullary features

Medullary carcinoma 8510/3

Atypical medullary carcinoma 8513/3

Invasive carcinoma NST with medullary features 8500/3

Carcinoma with apocrine differentiation

Carcinoma with signet-ring-cell differentiation

Invasive micropapillary carcinoma 8507/3\*

Metaplastic carcinoma of no special type 8575/3

Low-grade adenosquamous carcinoma 8570/3

Fibromatosis-like metaplastic carcinoma 8572/3

Squamous cell carcinoma 8070/3

Spindle cell carcinoma 8032/3

Metaplastic carcinoma with mesenchymal differentiation

Chondroid differentiation 8571/3

Ossaceous differentiation 8571/3

Other types of mesenchymal differentiation 8575/3

Mixed metaplastic carcinoma 8575/3

Myoepithelial carcinoma 8982/3

*Rare types*

Carcinoma with neuroendocrine features

Neuroendocrine tumour, well-differentiated 8246/3

Neuroendocrine carcinoma, poorly differentiated (small cell carcinoma) 8041/3

Carcinoma with neuroendocrine differentiation 8574/3

Secretory carcinoma 8502/3

Invasive papillary carcinoma 8503/3

Acholic cell carcinoma 8550/3

Mucoepidermoid carcinoma 8430/3

Polymorphous carcinoma 8525/3

Oncocytic carcinoma 8290/3

Lipid-rich carcinoma 8314/3

Glycogen-rich clear cell carcinoma 8315/3

Sebaceous carcinoma 8410/3

Salivary gland/skin adnexal type tumours

Cylindroma 8200/0

Clear cell hidradenoma 8402/0\*

### Epithelial-myoepithelial tumours

Pleomorphic adenoma 8940/0

Adenomyoepithelioma 8983/0

Adenomyoepithelioma with carcinoma 8983/3\*

Adenoid cystic carcinoma 8200/3

### Precursor lesions

Ductal carcinoma in situ 8500/2

Lobular neoplasia

Lobular carcinoma in situ

Classic lobular carcinoma in situ 8520/2

Pleomorphic lobular carcinoma in situ 8519/2\*

Atypical lobular hyperplasia

### Intraductal proliferative lesions

Usual ductal hyperplasia

Columnar cell lesions including flat epithelial atypia

Atypical ductal hyperplasia

### Papillary lesions

Intraductal papilloma 8503/0

Intraductal papilloma with atypical hyperplasia 8503/0

Intraductal papilloma with ductal carcinoma in situ 8503/2\*

Intraductal papilloma with lobular carcinoma in situ 8520/2

Intraductal papillary carcinoma 8503/2

Encapsulated papillary carcinoma 8504/2

Encapsulated papillary carcinoma with invasion 8504/3

Solid papillary carcinoma

In situ 8509/2

Invasive 8509/3

### Benign epithelial proliferations

Sclerosing adenosis

Apocrine adenosis

Microglandular adenosis

Radial scar/complex sclerosing lesion

Adenomas

Tubular adenoma 8211/0

Lactating adenoma 8204/0

Apocrine adenoma 8401/0

Ductal adenoma 8503/0

### MESENCHYMAL TUMOURS

Nodular fasciitis 8828/0\*

Myofibroblastoma 8825/0

Desmold-type fibromatosis 8821/1

Inflammatory myofibroblastic tumour 8825/1

Benign vascular lesions

Haemangioma 9120/0

Angiomatosis

Atypical vascular lesions

Pseudoangiomatous stromal hyperplasia

Granular cell tumour 9580/0

Benign peripheral nerve-sheath tumours

Neurofibroma 9540/0

Schwannoma 9560/0

Lipoma 8850/0

Angiolipoma 8861/0

Liposarcoma 8850/3

Angiosarcoma 9120/3

Rhabdomyosarcoma 8900/3

Osteosarcoma 9180/3

Lelomyoma 8890/0

Lelomyosarcoma 8890/3

### FIBROEPITHELIAL TUMOURS

Fibroadenoma 9010/0

Phyllodes tumour 9020/1

Benign 9020/0

Borderline 9020/1

Malignant 9020/3

Periductal stromal tumour, low grade 9020/3

Hamartoma

### TUMOURS OF THE NIPPLE

Nipple adenoma 8506/0

Syringomatous tumour 8407/0

Paget disease of the nipple 8540/3

## MALIGNANT LYMPHOMA

Diffuse large B-cell lymphoma 9680/3

Burkitt lymphoma 9687/3

T-cell lymphoma

Anaplastic large cell lymphoma, ALK-negative 9702/3

Extranodal marginal-zone B-cell lymphoma of MALT type 9699/3

Follicular lymphoma 9690/3

## METASTATIC TUMOURS

## TUMOURS OF THE MALE BREAST

Gynaecomastia

Carcinoma

Invasive carcinoma 8500/3

In situ carcinoma 8500/2

## CLINICAL PATTERNS

Inflammatory carcinoma 8530/3

Bilateral breast carcinoma

\* The morphology codes are from the International Classification of Diseases for Oncology (ICD-O) (463B). Behaviour is coded /0 for benign tumours, /1 for unspecified, borderline or uncertain behaviour, /2 for carcinoma in situ and grade III intraepithelial neoplasia, and /3 for malignant tumours. \* The classification is modified from the previous WHO histological classification of tumours (1413) taking into account changes in our understanding of these lesions. In the case of neuroendocrine neoplasms, the classification has been simplified to be of more practical utility in morphological classification. \* These new codes were approved by the IARC/WHO Committee for ICD-O.



## 4. Specimen Requirement/Protocols for Histopathology Specimen

### A. Appropriate Handling of Large Breast Specimens

- Time of removal from patient recorded on specimen requisition.
- Time from tissue acquisition to fixation should be as short as possible (preferably < 1 hour).
- Specimen + requisition form transported fresh to the pathology dept.
- Opened, orientated, inked and sliced at 5mm intervals
- Placed in adequate volume of neutral buffered 10% formalin for a minimum of 6 hours to 72 hour.
- Time placed in formalin recorded on the requisition form



**WHY ALL THESE PROTOCOLS??????**

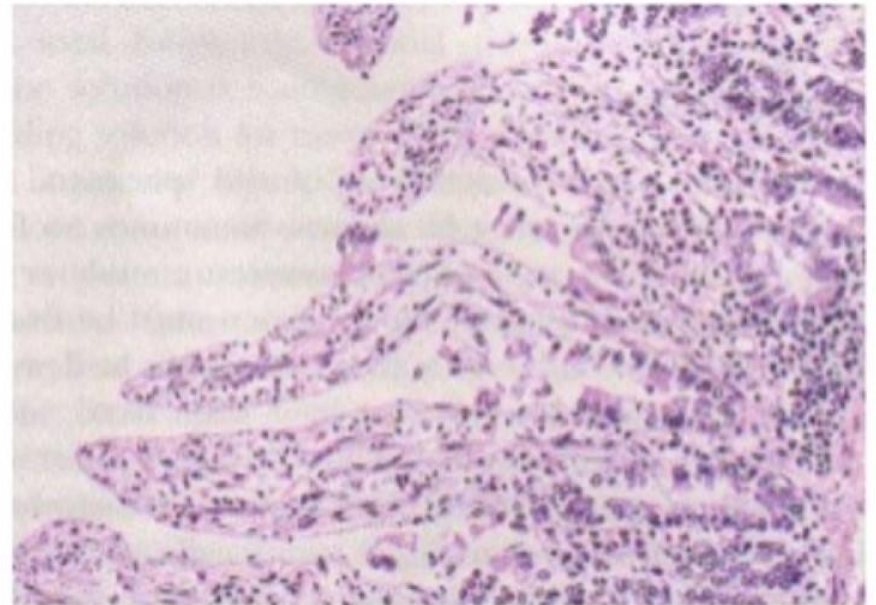


# Fixation

Good fixative is most important in the production of satisfactory results in histopathology



Small intestine well preserved



Autolyzed Small intestine

## 4. Specimen Requirement/Protocols for Histopathology Specimen

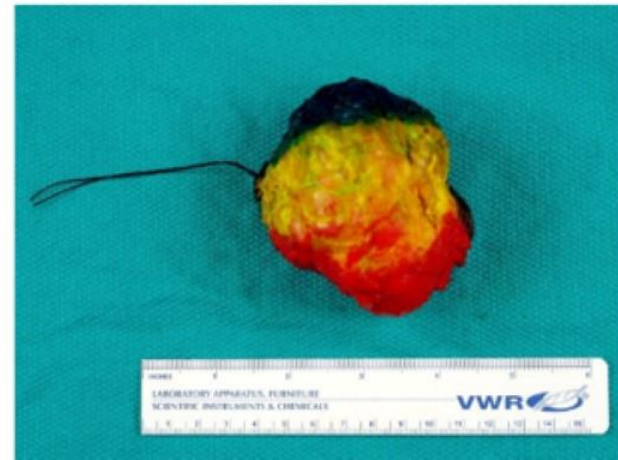


### B. Specimen Orientation

- Right breast lumpectomy
- Received fresh
- Suture
- identification (long lateral and short superior)

### C. Specimen Painting

- Margins identified and painted:
- Anterior yellow
- Superior blue
- Posterior black
- Inferior red





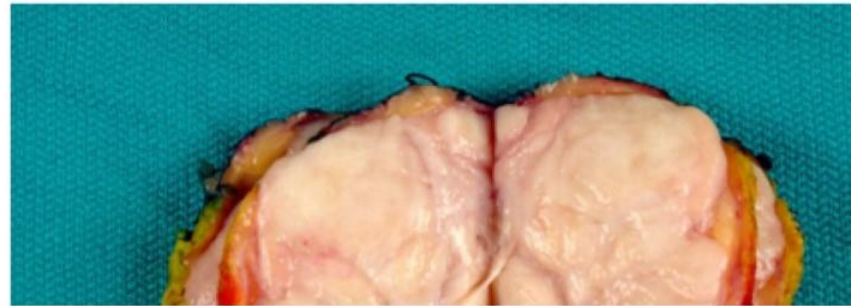
## 4. Specimen Requirement/Protocols for Histopathology Specimen

### C. Specimen Slicing:

Specimen serially sectioned

Lesion identified

Margin proximity evident

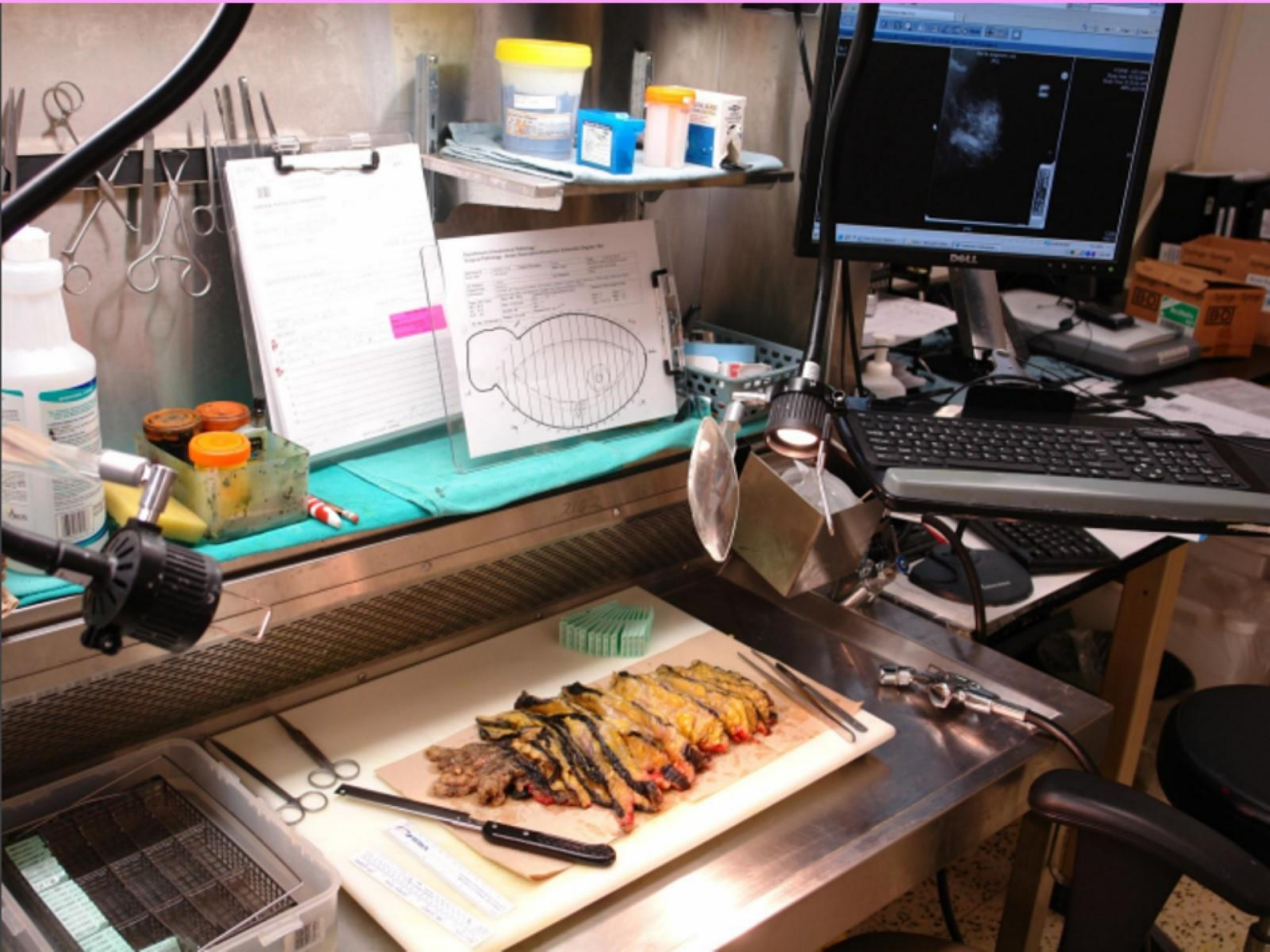


### D. Formalin Fixation:

Specimen prepared for form









## **4. Specimen Required for Histopathology**



- 1. Core-Needle Biopsy**
- 2. Incisional Biopsy**
- 3. Excisional Biopsy or Lumpectomy:**
  - Image-guided localization excisions**
  - Without image-guided localization**
  - Wide Local Excision**
- 4. Total Mastectomy**



## 4. Specimen Required for Histopathology

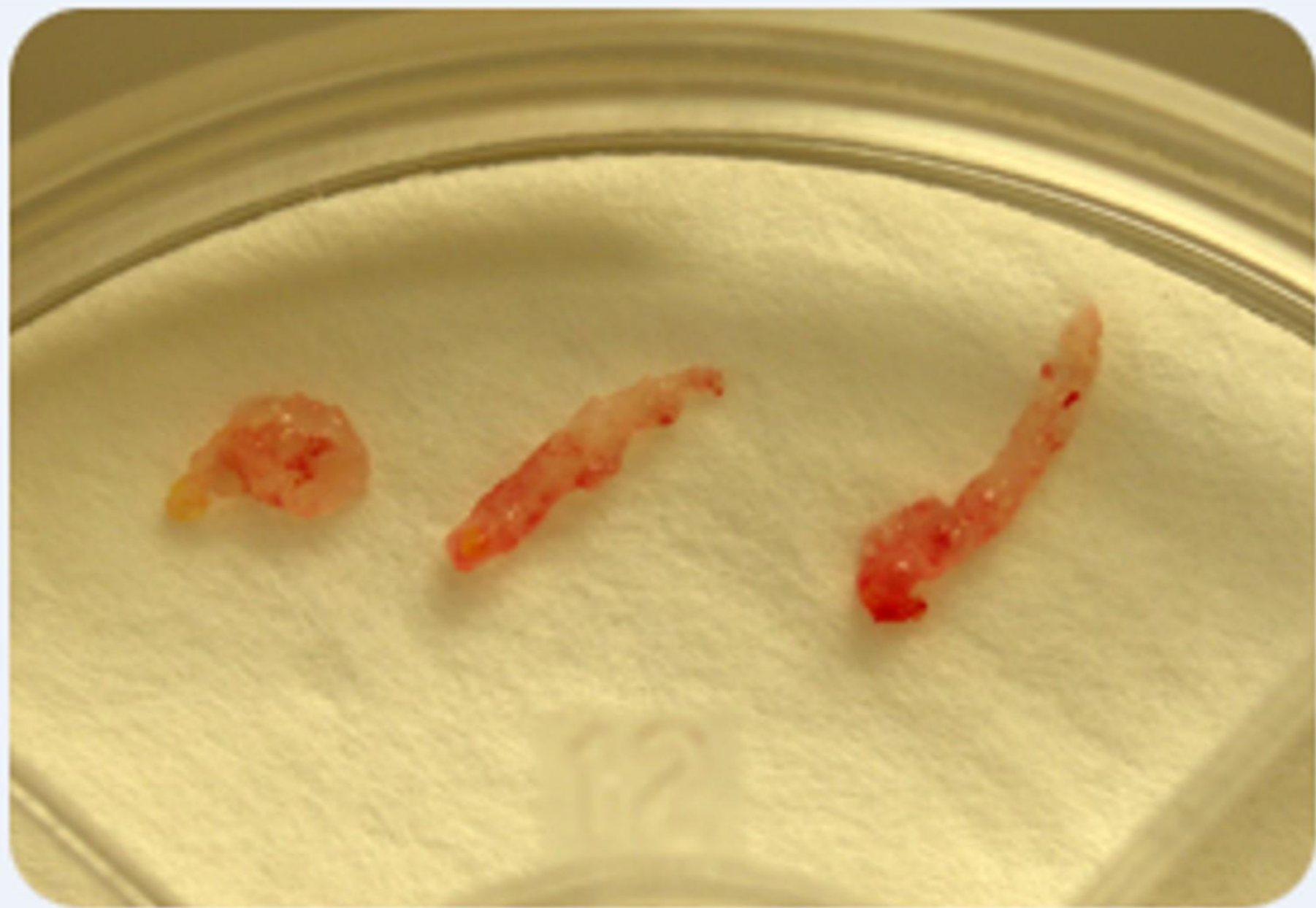


### 1. Core-Needle Biopsy: (Gold Standard)

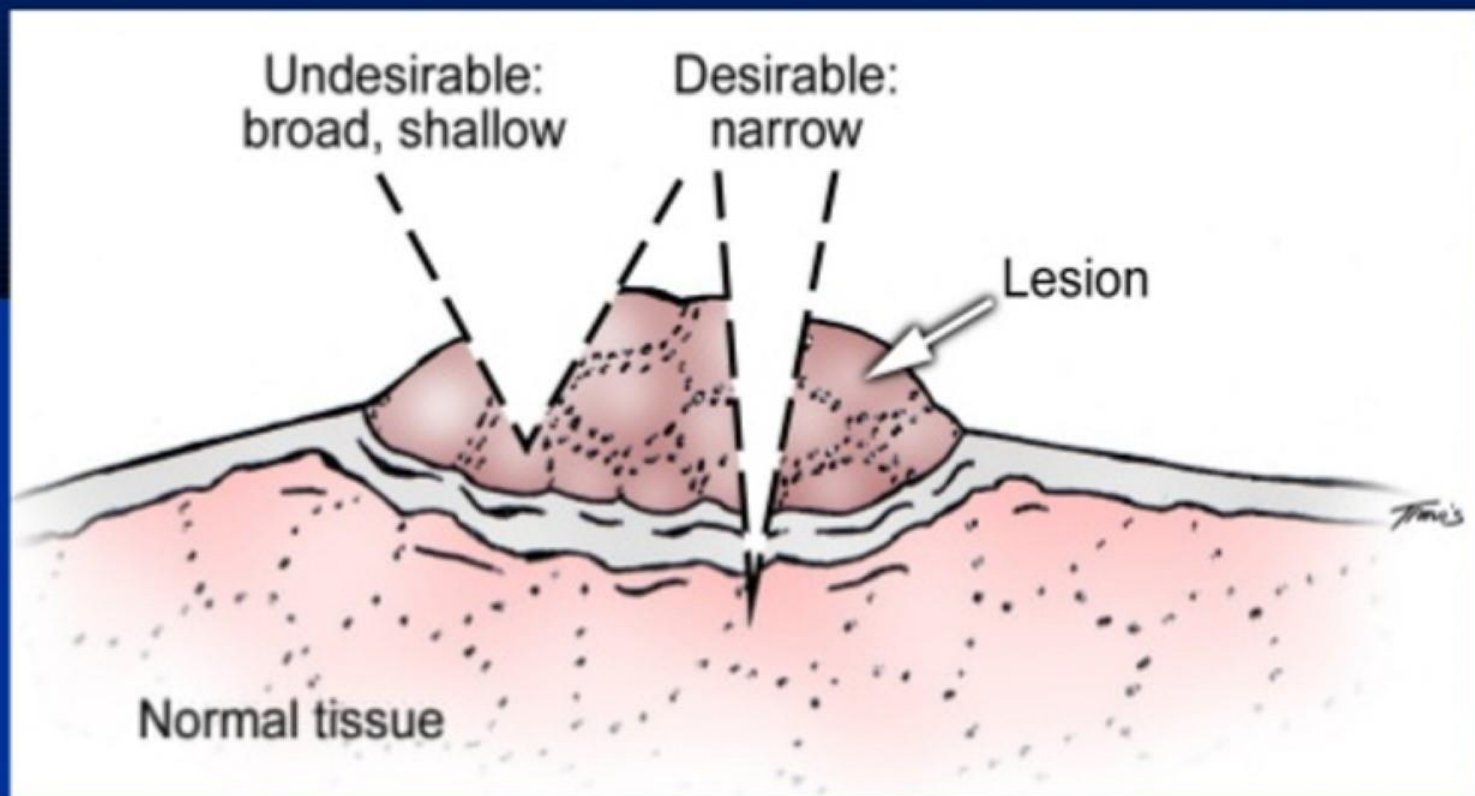
- **palpation guided** - used to sample a clinically palpable mass
- **stereotactic** - used to sample mammographic findings (typically calcifications)
- **ultrasound guided** - commonly used to sample mass lesions or MR findings with ultrasound correlates
- **MRI guided** - used to sample findings not well visualized by other imaging modalities







# INCISIONAL BIOPSY



✓ Narrow, deep  
x Broad, shallow



## 4. Specimen Required.....cont



### 3. Excisional Biopsy or Lumpectomy:

Usually performed for complete removal of a targeted imaging or clinical finding for a known DCIS, invasive carcinoma, fibroepithelial lesion or other malignancy. Negative margins are a goal.

- **Image-guided localization excisions:** For non-palpable masses.
- **Without image-guided localization:** For palpable masses.
- **Wide Local Excision**



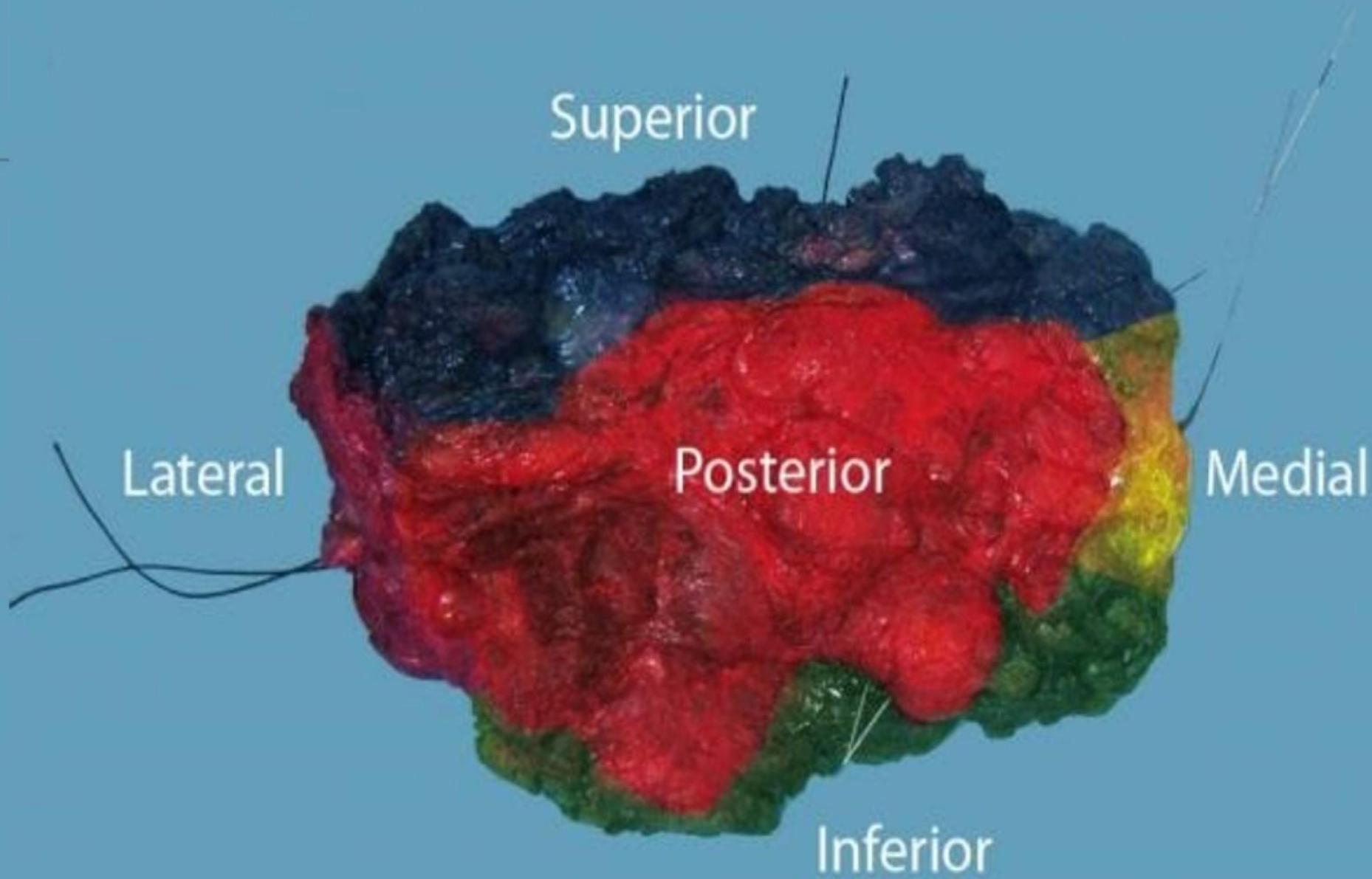
Superior

Lateral

Posterior

Medial

Inferior



## 4. Specimen Requirement.....cont



### 4. Total Mastectomy:

- **Simple mastectomy:** without removal of axillary lymph nodes.
- **Skin sparing mastectomy:** with removal of the nipple and only a narrow surrounding rim of skin.
- **Nipple sparing mastectomy:** without removal of skin or nipple.
- **Modified radical mastectomy:** total mastectomy with an axillary dissection.
- **Radical mastectomy:** total mastectomy with removal of the pectoralis major and pectoralis minor muscles as well as axillary contents.
- **Toilet mastectomy:** removal of breast in cases of locally advanced breast cancer for cosmetic reasons rather than being for curative purposes.







## 5. How Grading of the breast cancer is done?



Feature	Score
Tubule formation (%)	
Majority of tumor (>75)	1
Moderate degree (10-75)	2
Little or none (<10)	3
Nuclear pleomorphism	
Small, uniform cells	1
Moderate increase in size/variation	2
Marked variation	3
Mitotic counts (per 10-40×fields)	
0-5 (histo) or 0-1 (cyto)	1
6-10 (histo) or 2-4 (cyto)	2
>11 (histo) or >5 (cyto)	3
Grade 1 (well-differentiated) (sum)	3-5
Grade 2 (moderately differentiated) (sum)	6-7
Grade 3 (poorly differentiated) (sum)	8-9

SBR=Scarff-Bloom-Richardson



Grade 1

**Nuclear Pleomorphism:**

Uniform cells with small nuclei similar in size to normal breast epithelial cells

**Mitotic Count:**

< 7 mitoses per 10 high power fields



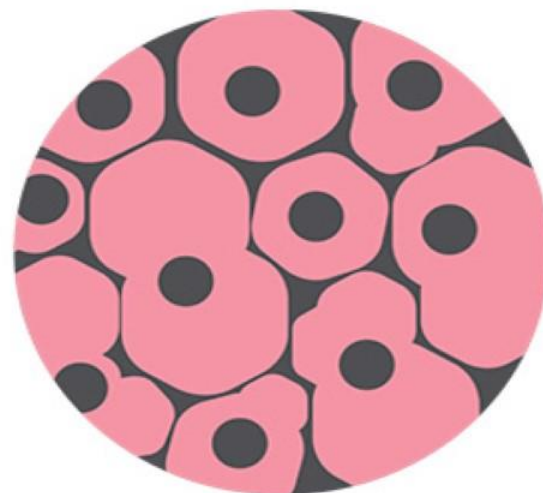
Grade 2

**Nuclear Pleomorphism:**

Cells larger than normal with open vesicular nuclei, visible nucleoli, and moderate variability in size and shape

**Mitotic Count:**

8-15 mitoses per 10 high power fields



Grade 3

**Nuclear Pleomorphism:**

Cells with vesicular nuclei, prominent nucleoli, marked variation in size and shape

**Mitotic Count:**

> 16 mitoses per 10 high power fields



## 6. Most common Breast Cancer Types

1. Invasive ductal carcinoma of no special type (NST)

2. Special subtypes:

- **Invasive lobular carcinoma**

- Tubular carcinoma
- Carcinoma with medullary features
- Metaplastic carcinoma
- Carcinomas with apocrine differentiation
- Salivary gland/skin adnexal type tumors

Adenoid cystic carcinoma

Mucoepidermoid carcinoma

Polymorphous carcinoma

- Mucinous carcinoma and carcinomas with signet-ring-cell differentiation
- Carcinomas with neuroendocrine features
- Invasive papillary carcinoma
- Invasive micropapillary carcinoma
- Inflammatory carcinoma







**How and Why to differentiate them???**





# TAKE HOME MESSAGE



1. **ALWAYS** consider patient life as important as yours!
2. **NEVER EVER** waste any tissue or organ?
3. **ALWAYS** send the tissue or organ for histopathology
4. **ALWAYS** send the tissue or organ in 10% formalin
5. **NEVER EVER** divide the tissue to send to two pathologists
6. **ALWAYS** send intact and oriented tissue for HP
7. **ALWAYS** send with complete and proper history



A large, disorganized pile of 3D block letters in various colors (red, blue, yellow, green, purple, orange) is scattered on the left side of the image. The letters are of different sizes and are partially overlapping each other. The background is a rustic, greyish-brown wooden surface with visible grain and knots.

THANK  
YOU





**Questions-???**

**Brain-Storming Questions**