DOC TUTORIALS

PG Residency

# Pediatrics

## Endocrine Surgery

Smart Notes. Better Scores.

# Prognostic Staging and Molecular Classification Framework for Breast Cancer Management

## TNM Prognostic Staging

| Stage | Clinical Classification |
|---|---|
| Stage I, IIa, IIb | Early Breast Cancer |
| Stage IIIa, IIIb, IIIc | Locally Advanced |
| Stage IV | Breast Cancer |

## Molecular Subtype Matrix

| Subtype Receptor Profile | Subtype Receptor Profile | Key Markers |
|---|---|---|
| Luminal A | ER/PR(+), HER2 (-) | Low Ki-67 (Low risk) |
| Luminal A (Variant) | ER/PR (+), HER2 (-) | High Ki-67 (High risk) |
| Luminal B | ER/PR(+), HER2 (+/-) | High proliferation markers |
| Triple Positive | ER/PR(+), HER2 (+) | - |
| HER2 Overexpressed | ER/PR(-), HER2 (+) | - |
| Triple Negative (TNBC) | ER(-), PR(-), HER2 (-) | Aggressive Phenotype |

Disease Spread Models: Halstedian (Local control) vs. Fisher (Systemic) vs. Spectrum (Hybrid/Standard)

# Neoadjuvant Chemotherapy (NACT) Principles

## Downstaging Strategies and Regimens

**Mandatory (Inoperable)**

- ✓ T4 Tumors (Skin/Chest wall infiltration)
- ✓ Large Tumors (7-10 cm)
- ✓ Bulky Axillary Nodes (N2/N3)
- ✓ Inflammatory Carcinoma

**Strategic (Operable)**

- ✓ HER2 Positive
- ✓ Triple Negative (TNBC)
- ✓ Tumor >2 cm or Node Positive
- ✓ Large tumor/small breast ratio (to enable BCS)

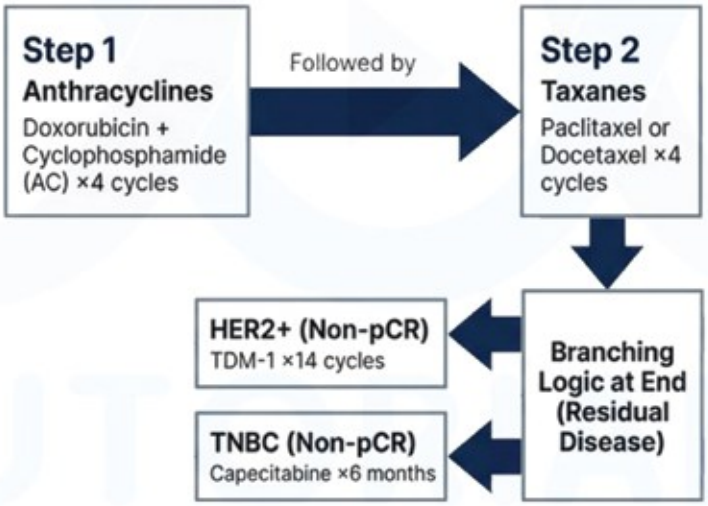
**Advantages**

In-vivo assessment (pCR = Prognosis)

Downstaging for BCS

Genetic testing window

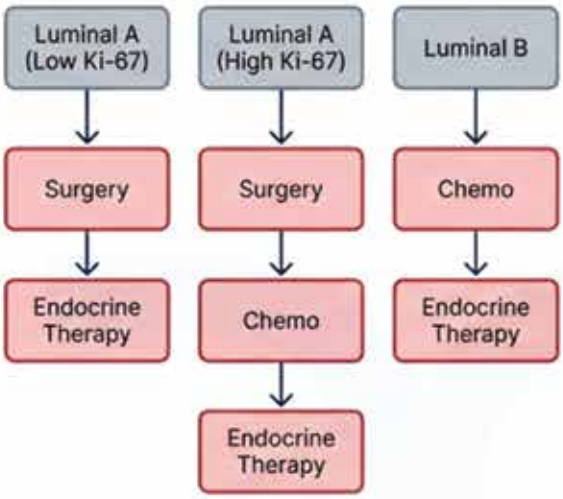
## Standard Regimen Timeline



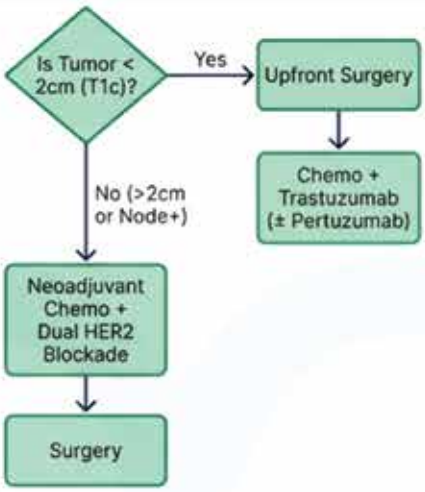
# Subtype-Based Management Algorithms

## Decision Pathways: Surgery vs. Neoadjuvant Therapy

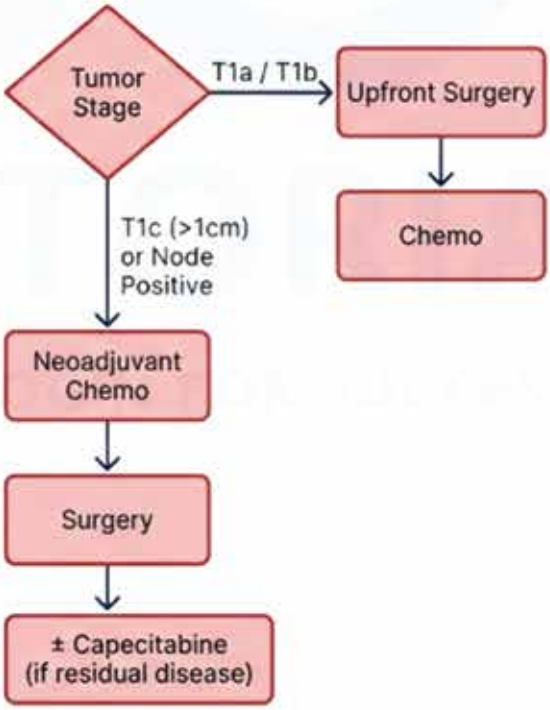
### HR Positive/ HER2 Negative




### HER2 Positive (Early Stage)



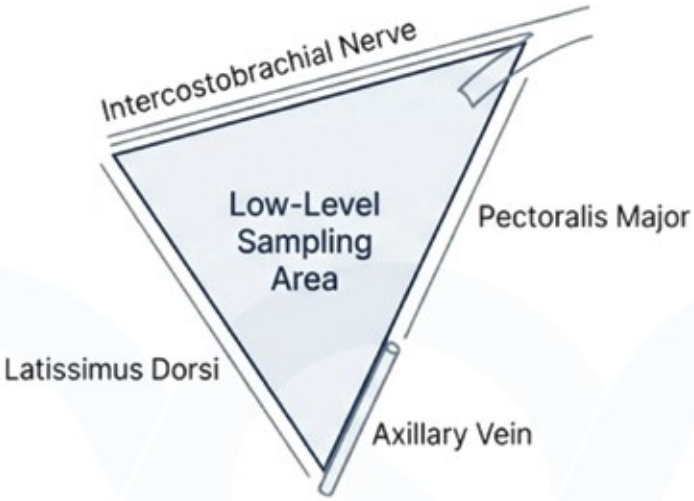

### Triple Negative (TNBC)



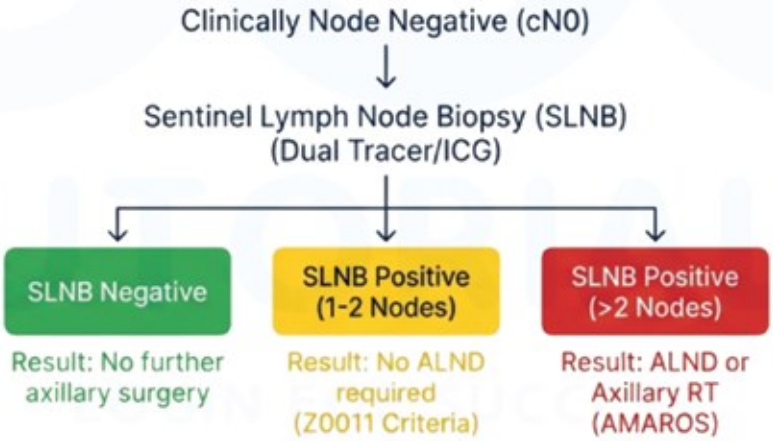
# Surgical Management: Primary & Axilla

## ConservationGuidelinesandNodalStaging

### The Axillary Boundaries




### Axillary Management Flowchart




### Primary Tumor Surgery

- Breast Conservation (BCS)
- Margins: No tumor on ink (Invasive), >2mm (DCIS)
- Mastectomy (MRM)
- Includes Nipple-Areola Complex + Pectoralis Major Fascia + Level I/II Nodes

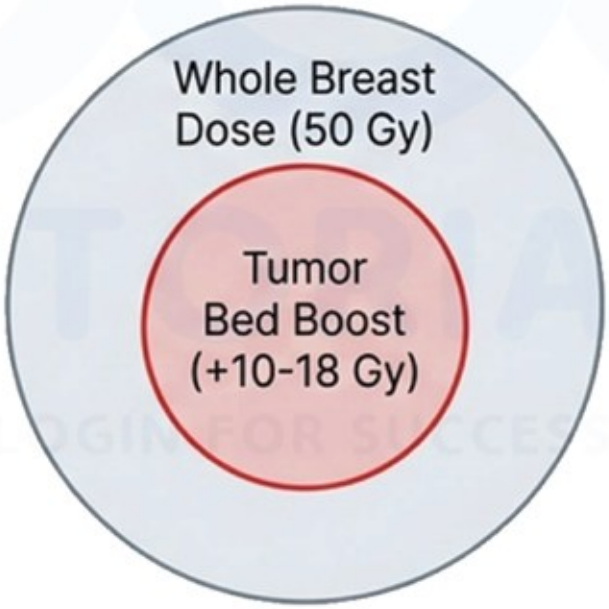
# Radiotherapy Guidelines

## IndicationsforPost-Mastectomyand Post-BCS Radiation

**Radiotherapy Indications**

| Setting | Mandatory Indication | Conditional / Risk-Based |
|---|---|---|
| Post-BCS | Whole Breast RT | Tumor Bed Boost (10-18 Gy)for close/positive margins |
| Post Mastectomy (PMRT) | (Universal) | TNBC, LVI, Grade 3, YoungAge |
| RegionalNodes | ≥4 Positive Nodes, Extranodal Extension | Internal Mammary RT (Central/Medial tumors, StageIII) |

**The Boost concept**

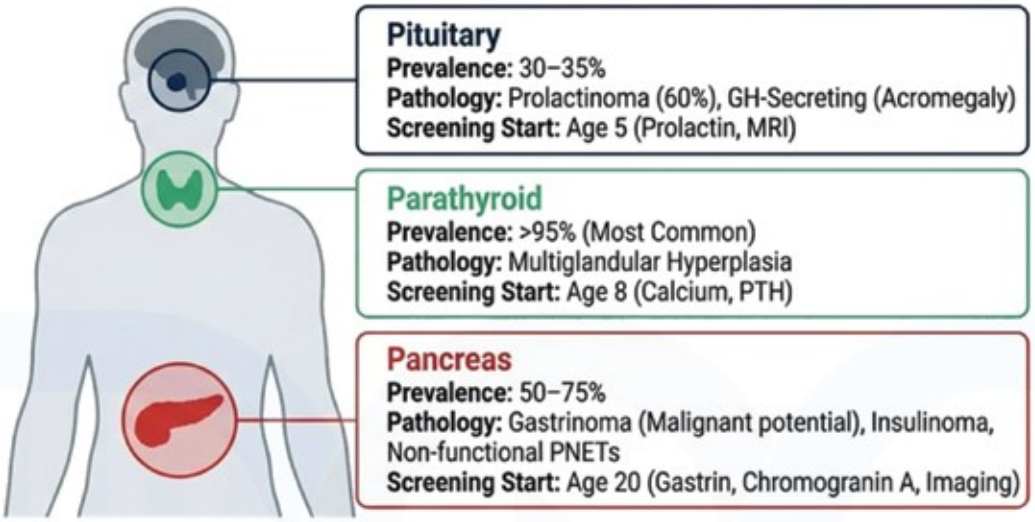



**Reduces local recurrence**

- APBI Criteria: Accelerated Partial Breast Irradiation (APBI)
- Candidates: Elderly, Small (<2cm), Unicentric, HR+, Low Grade, Node Negative.

## MEN1 (Wermer Syndrome)

### The '3Ps'and Surveillance Strategy




Genetics: MEN1 gene (Chr 11q13) - Menin protein.

Diagnostic Criteria: ≥2 of 3 major components OR 1 major component+ family history.

## MEN2 & MEN3: RET Proto-Oncogene Management

### Genotype-Phenotype Correlation & Surgical Timing

| Prophylactic Thyroidectomy Criteria | | | |
|---|---|---|---|
| Risk Level | Mutation | Syndrome | Surgical Deadline |
| Risk Level: **Highest Risk** | Mutation: **M918T** | Syndrome: **MEN3 (MEN2B)** | Surgical Deadline: **Neonatal period** (First months of life) |
| Risk Level: **High Risk** | Mutation: **C634** | Syndrome: **MEN2A** | SurgicalDeadline: **Before Age 5** |
| Risk Level: **Moderate Risk** | Mutation: **Various** | Syndrome: **FMTC/other** | Surgical Deadline: **Monitor calcitonin** (Operate if elevated |

### Syndromic Features

**MEN2A:**

- MTC
- Pheochromocytoma (~50%) Parathyroid Hyperplasia (20-30%)

**MEN3 (MEN2B):**

- MTC (100%) Pheochromocytoma (50%)
- Marfanoid Habitus
- Mucosal Neuromas (No Parathyroid disease)

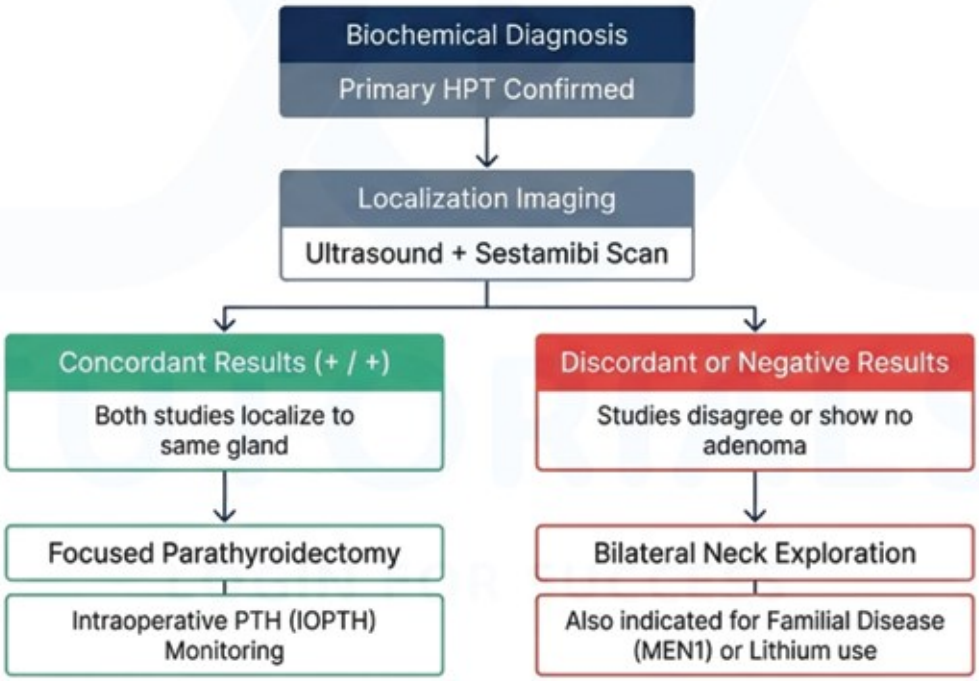
### Key Clinical Rule

**CRITICAL: Pheochromocytoma must be managed FIRST (Alpha-blockade → Beta-blockade) before any thyroid surgery to prevent hypertensive crisis.**

**Clinical Editorial Precision**

## Hyperparathyroidism: Management & Localization

### Surgical Decision-Making Algorithm




### Medical Management Panel

- **Bisphosphonates:** Bone protection (Lumbar/Femur). Minimal effect on Calcium.
- **Cinacalcet:** Calcimimetic. Lowers Calcium. Use for surgical unfit or severe symptoms.

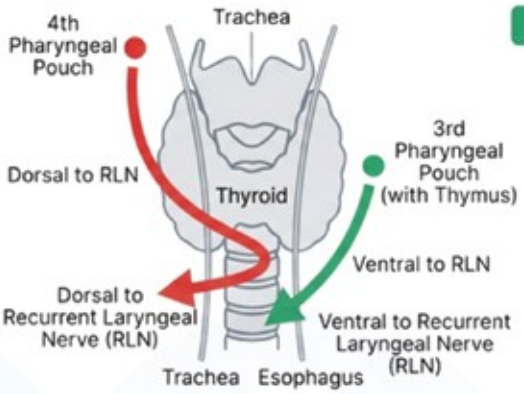
## Surgical Anatomy and Migration Patterns

### Embryological Descent of the Parathyroids

**Superior Gland Path** (Arrow 1)

- Starts high → Starts high → Falls Posterior & Deep

- Ectopic Sites: Retro-esophageal, Para-esophageal, Posterior Mediastinum




**Inferior Gland Path** (Arrow 2)

- Starts low → Falls Anterior

- Ectopic Sites: Thyrothymic ligament, Anterior/Superior Mediastinum

### Identification Tips

**Appearance:** Darker brown/reddish, firm, distinct vascular pedicle.

**Gliding Sign:** Normal glands move within fat; abnormal glands do not.

**ClinicalEditorialPrecision**

## Parathyroid Survey & Multi-Gland Strategy

### Systematic Intra-operative Protocol

**Targeted**
Explore the most abnormal gland first.


**Ipsilateral**
Explore the ipsilateral gland (same side).
Check for double adenoma.

**Ectopic Search (If gland missing)**

- **Missing Superior**
  Retro-esophageal space, Intrathyroidal.
- **Missing Inferior**
  Retract Thymus (Thyrothymic fat), Carotid Sheath (Space of Reeves).

**Contralateral**
Explore contralateral glands.
Use "Mirror Image Symmetry".

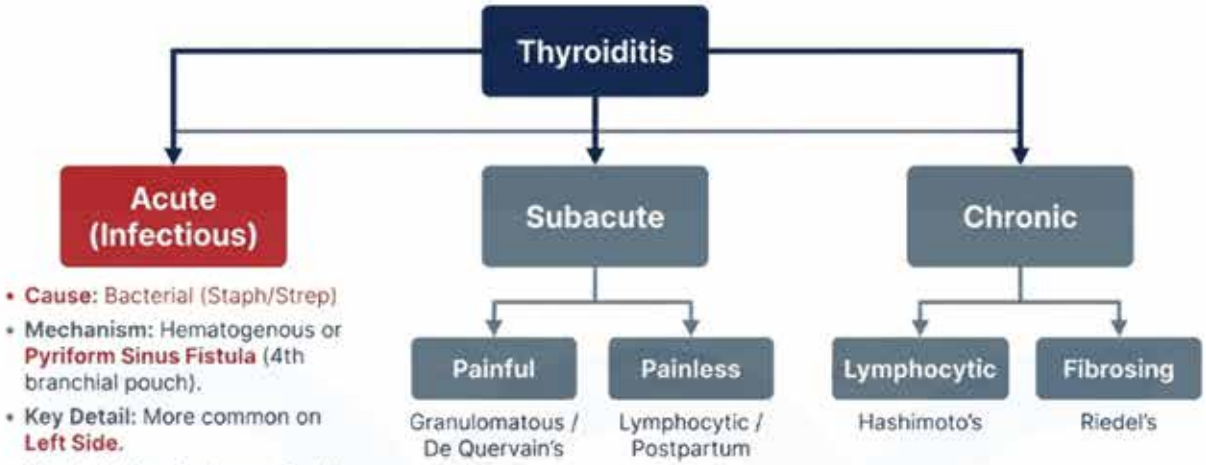
### Multi-Gland Management (MEN/Hyperplasia)

A. Subtotal Parathyroidectomy
- Excise 3.5 glands. Leave ~50mg vascularized remnant (mark with clip).

B: Total Parathyroidectomy + Autotransplant
- Resect 4 glands. Implant 10-20 fragments into non-dominant forearm (Brachioradialis).

## Thyroiditis: Classification & Acute Forms

**Diagnostic**

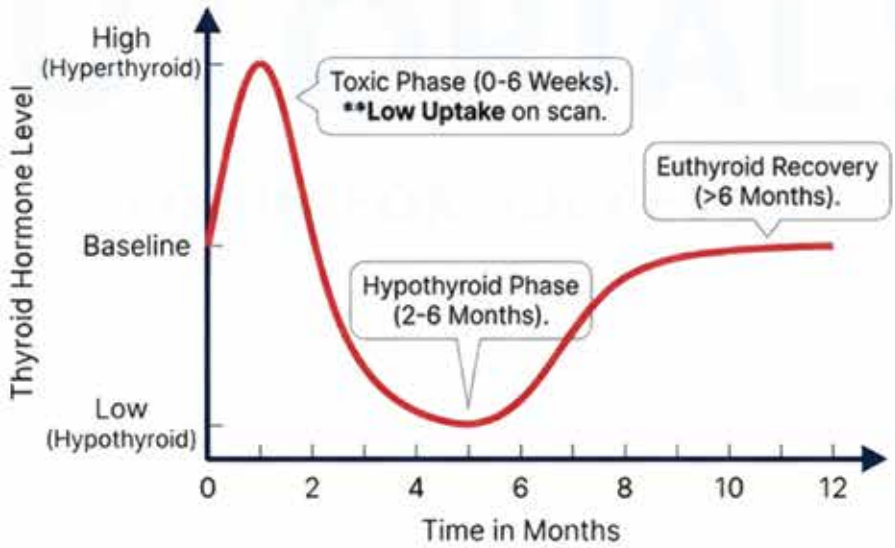



- **Cause:** Bacterial (Staph/Strep)
- **Mechanism:** Hematogenous or **Pyriform Sinus Fistula** (4th branchial pouch).
- **Key Detail:** More common on **Left Side.**
- **Mgmt:** IV Abx, Drainage. Excision of fistula tract required.

## Subacute Thyroiditis & Pregnancy Targets

**Clinical Course and Non-Negotiable Cutoffs**

**Subacute Thyroiditis Course**




*Note*: Mgmt: NSAIDs/Steroids for pain. Beta-blockers for toxic phase.

### Pregnancy Targets

- TSH Upper Limits (Non-Negotiable)

| | |
|---|---|
| 1st Trimester: | **< 2.5mIU/L** |
| 2nd/3rd Trimester: | **< 3.0mIU/L** |

### Treatment Rules

- Overt Hypothyroidism: Treat.
- Subclinical (TSH >10): Treat.
- Subclinical (TSH 4-10 + Anti-TPO): Consider Treatment.

## Chronic Pathologies: Hashimoto's vs. Riedel's

Lymphocytic vs. Fibrosing Disease

**Hashimoto's (Chronic Lymphocytic)**

- **Mechanism:** Autoimmune T-cell driven.
- **Markers:** Anti-TPO (>95%), Anti-Tg.
- **Histology:** Lymphocytic infiltration, Germinal centers, Hurthle Cells.
- **Risks:** B-cell Lymphoma (80x risk), Papillary Carcinoma (30%).
- **Mgmt:** Thyroxine replacement.

**Riedel's (Chronic Fibrosing)**

- **Mechanism:** IgG4-related systemic fibrosis.
- **Presentation:** Woody Hard Goiter, fixed to strap muscles.
- **Associations:** Retroperitoneal fibrosis, Sclerosing cholangitis.
- **Complications:** Tracheal compression, RLN palsy, Hypoparathyroidism.
- **Mgmt:** Tamoxifen, Steroids. Surgery hazardous due to invasion.

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