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Optimizing Biomarker Testing

Through Coordinated Multidisciplinary Care in ER+/HER2- Metastatic Breast Cancer

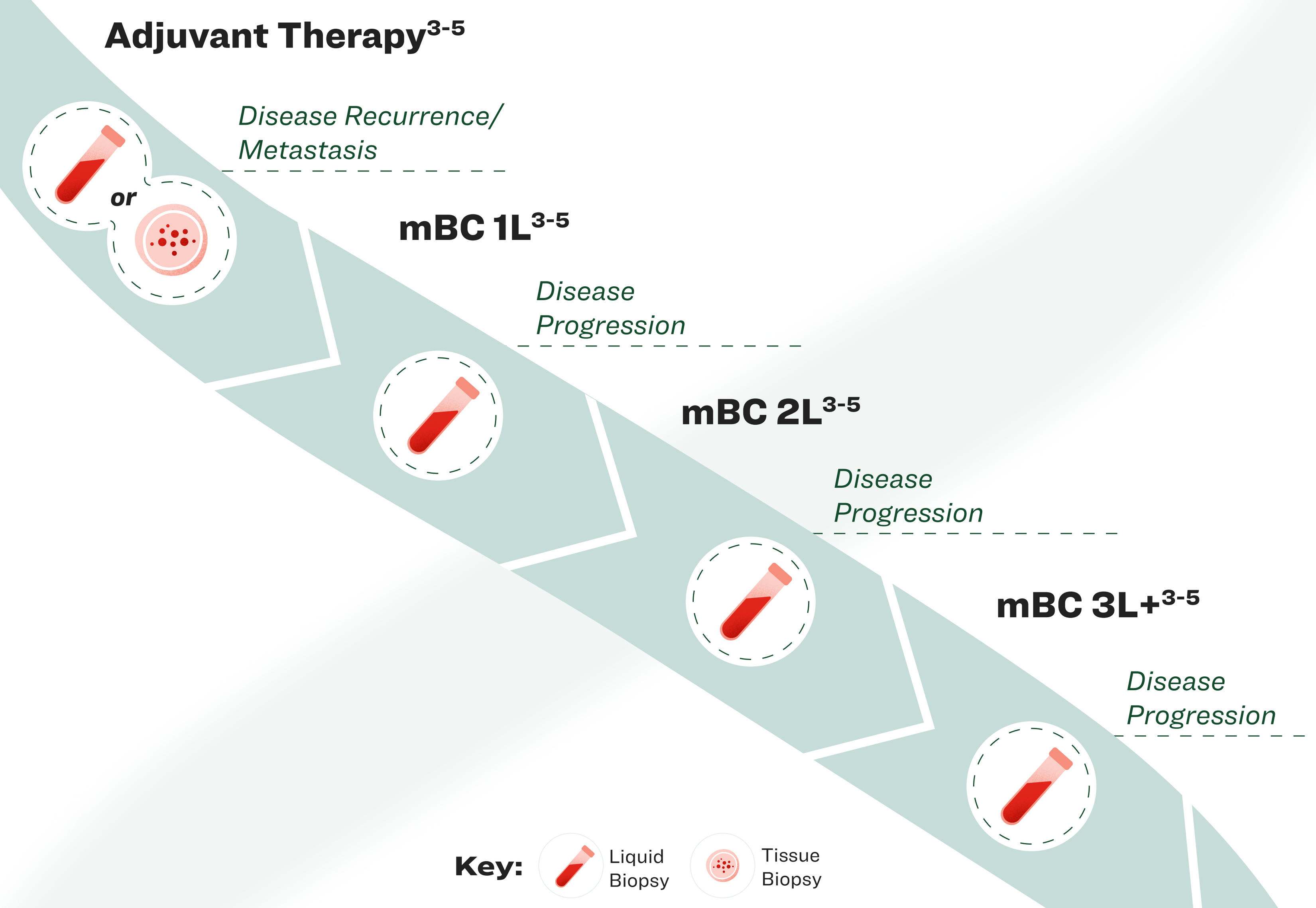
Supporting education and awareness across all disciplines within the MDT to enable informed treatment decisions through efficient biomarker testing

When?
Timeline for Biomarker Testing

Genomic testing should be **performed at the time of diagnosis**[1]

Guidelines recommend genomic testing at disease recurrence or progression on endocrine therapy in ER+/HER2- metastatic breast cancer, to identify actionable biomarkers and potential resistance mechanisms (eg, *ESR1* mutations)[1,2]

Testing should be repeated on blood or tissue **obtained at the time of progression**[1,2]



Rebiopsy for tissue samples may not always be available[3,4]

ctDNA analysis may provide greater sensitivity for mutations[2,4,5]

Clinicians should wait for test results before initiating or modifying therapy and be able to accurately interpret biomarker findings[1]

Ensure the MDT is trained on sampling practices, and follows a standardized workflow for ordering and processing appropriate biomarker testing[6]

How?
Guidelines for Handling Tissue and Liquid Biopsy

Collection and Transportation[6,7]

- Collaborate with tissue providers
- Monitor sample collection and fixation initiation times
- Cold ischemia <30 minutes

- Collect blood and process with anticoagulants (<2 hours) or preservatives (≥2 hours)
- Minimum plasma volume: 2 mL

Sample Handling[6,7]

- Minimize time from tissue acquisition to fixation
- Fix tissue in 10% NBF; avoiding over/under fixation
- Follow protocols for clean, serial sectioning

- Separate plasma with double spin protocols (4 °C) without brake
- Store unprocessed plasma at -80 °C
- Process other bodily fluids with specific protocols

Sample Adequacy[6]

- Estimate tumor content
- Mark areas on H&E slides to guide macrodissection
- Use microdissection in select cases

- Infer tumor fraction during the analytic phase

Nucleic Acids Extraction[6]

- Deparaffinize tissue sections
- Perform tissue lysis
- Use silica-based methods
- Store in water-based buffers
- Quantify NAs and assess fragment size

- Extract cfDNA using dedicated methods to mitigate the low abundance and high fragmentation of circulating DNA

Consistent education helps support a uniform approach to testing and equitable care for all patients[1,8]

1L=First-Line; 2L=Second-Line; 3L=Third-Line; cfDNA=Cell-Free Deoxyribonucleic Acid; ctDNA=Circulating Tumor Deoxyribonucleic Acid; DNA=Deoxyribonucleic Acid; ER=Estrogen Receptor; ESR1=Estrogen Receptor 1; ET=Endocrine Therapy; HER2=Human Epidermal Growth Factor Receptor 2; H&E=Hematoxylin and Eosin; mBC=Metastatic Breast Cancer; MDT=Multidisciplinary Team; NA=Nucleic Acid; NBF=Neutral Buffered Formalin.

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2. Burstein HJ, et al. *J Clin Oncol.* 2023;41(18):3423-3425.
3. Maulanisa S, et al. *Scalpellum.* 2025;1(2):1-5.
4. Schiavone ML, et al. *J Liq Biopsy.* 2025;9:100312.
5. Paraskar G, Anitha K, Swetha A, Prasad D. In: Bhatt S, Anitha K, Chenchula S, Mishra N, eds. *Liquid Biopsy in Cancer Management.* 2026:57-84.
6. Marchio C, et al. *Pathologica.* 2025;117(Suppl. 1):S5-S17.
7. Wolff AC, et al. *J Clin Oncol.* 2023;41(22):3867-3872.
8. Salam RA, et al. *JCO Precis Oncol.* 2025:e2500063.