

REENGINEERING THE APPROACH TO METASTATIC BREAST CANCER

A Stepwise Guide to HER2 Testing and Management for HER2-Low and -Ultralow Disease

PART 2: Mastering HER2-low and Ultralow mBC: Precise Testing for Targeted Therapeutic Selection

Supported by educational grants from AstraZeneca Pharmaceuticals and Daiichi Sankyo, Inc.

EFFICIENT

Project Overview

- HER2-directed therapies transformed the treatment of breast cancer (BC). Initially, this benefit was limited to ~15% of patients with clear HER2 amplification or overexpression; however, it is now recognized that patients previously classified as “HER2-negative” may still derive meaningful benefit from antibody–drug conjugates (ADCs).

- This emerging understanding challenges traditional binary HER2 classification and underscores new diagnostic and therapeutic complexities. With the recognition of HER2-low and now HER2-ultralow disease categories, oncologists, pathologists, and multidisciplinary care teams face evolving questions about testing accuracy, interpretation, and therapeutic decision-making.

PURPOSE: Provide practical guidance on the identification and interpretation of HER2-low/-ultralow metastatic BC (mBC) using real world examples of how select institutions have optimized their testing and reporting algorithms

3-PART ACTIVITY SERIES

ACTIVITY 1 – Unveiling HER2-low and -ultralow Expression in mBC: Implications for the Multidisciplinary Care Team

ACTIVITY 2 – What’s Your Protocol? Streamlining Oncology/Pathology Collaboration Throughout the BC Journey

ACTIVITY 3 – Mastering HER2-low and -ultralow mBC: Precise Testing for Targeted Therapeutic Selection

HER2, Human epidermal growth factor receptor 2.

MEDICAL EDUCATION RESOURCES EFFICIENT

Project Overview

- HER2-directed therapies transformed the treatment of breast cancer (BC). Initially, this benefit was limited to ~15% of patients with clear HER2 amplification or overexpression; however, it is now recognized that patients previously classified as “HER2-negative” may still derive meaningful benefit from antibody–drug conjugates (ADCs).

- This emerging understanding challenges traditional binary HER2 classification and underscores new diagnostic and therapeutic complexities. With the recognition of HER2-low and now HER2-ultralow disease categories, oncologists, pathologists, and multidisciplinary care teams face evolving questions about testing accuracy, interpretation, and therapeutic decision-making.

PURPOSE: Provide practical guidance on the identification and interpretation of HER2-low/-ultralow metastatic BC (mBC) using real world examples of how select institutions have optimized their testing and reporting algorithms

3-PART ACTIVITY SERIES

ACTIVITY 1 – Unveiling HER2-low and -ultralow Expression in mBC: Implications for the Multidisciplinary Care Team

ACTIVITY 2 – What’s Your Protocol? Streamlining Oncology/Pathology Collaboration Throughout the BC Journey

ACTIVITY 3 – Mastering HER2-low and -ultralow mBC: Precise Testing for Targeted Therapeutic Selection

HER2, Human epidermal growth factor receptor 2.

MEDICAL EDUCATION RESOURCES EFFICIENT

Project Overview

- HER2-directed therapies transformed the treatment of breast cancer (BC). Initially, this benefit was limited to ~15% of patients with clear HER2 amplification or overexpression; however, it is now recognized that patients previously classified as “HER2-negative” may still derive meaningful benefit from antibody–drug conjugates (ADCs).

- This emerging understanding challenges traditional binary HER2 classification and underscores new diagnostic and therapeutic complexities. With the recognition of HER2-low and now HER2-ultralow disease categories, oncologists, pathologists, and multidisciplinary care teams face evolving questions about testing accuracy, interpretation, and therapeutic decision-making.

PURPOSE: Provide practical guidance on the identification and interpretation of HER2-low/-ultralow metastatic BC (mBC) using real world examples of how select institutions have optimized their testing and reporting algorithms

3-PART ACTIVITY SERIES

ACTIVITY 1 – Unveiling HER2-low and -ultralow Expression in mBC: Implications for the Multidisciplinary Care Team

ACTIVITY 2 – What’s Your Protocol? Streamlining Oncology/Pathology Collaboration Throughout the BC Journey

ACTIVITY 3 – Mastering HER2-low and -ultralow mBC: Precise Testing for Targeted Therapeutic Selection

HER2, Human epidermal growth factor receptor 2.

MEDICAL EDUCATION RESOURCES EFFICIENT

Project Overview

- HER2-directed therapies transformed the treatment of breast cancer (BC). Initially, this benefit was limited to ~15% of patients with clear HER2 amplification or overexpression; however, it is now recognized that patients previously classified as “HER2-negative” may still derive meaningful benefit from antibody–drug conjugates (ADCs).

- This emerging understanding challenges traditional binary HER2 classification and underscores new diagnostic and therapeutic complexities. With the recognition of HER2-low and now HER2-ultralow disease categories, oncologists, pathologists, and multidisciplinary care teams face evolving questions about testing accuracy, interpretation, and therapeutic decision-making.

PURPOSE: Provide practical guidance on the identification and interpretation of HER2-low/-ultralow metastatic BC (mBC) using real world examples of how select institutions have optimized their testing and reporting algorithms

3-PART ACTIVITY SERIES

ACTIVITY 1 – Unveiling HER2-low and -ultralow Expression in mBC: Implications for the Multidisciplinary Care Team

ACTIVITY 2 – What’s Your Protocol? Streamlining Oncology/Pathology Collaboration Throughout the BC Journey

THIS ACTIVITY

ACTIVITY 3 – Mastering HER2-low and -ultralow mBC: Precise Testing for Targeted Therapeutic Selection

HER2, Human epidermal growth factor receptor 2.

MEDICAL EDUCATION RESOURCES EFFICIENT

Faculty

EMORY UNIVERSITY



Jane Meisel, MD, FASCO
(C H A I R)

Professor | Hematology and Medical Oncology

Co-Director | Breast Medical Oncology,



Xiaoxian (Bill) Li, MD, PhD*

Professor and Chair

Department of Pathology and Laboratory Medicine

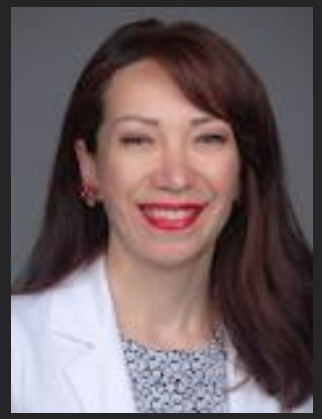
MOFFITT CANCER CENTER



Hatem Soliman MD

Senior Member | Breast Oncology and Immunology Departments

Medical Director, Clinical Trials Office



Zena Jameel, MD

Interim Director | Breast Pathology Associate Member

Director of Oncologic Surgical Pathology Fellowship

FLORIDA CANCER SPECIALISTS



Lucio N. Gordan, MD

President/Managing Physician

Chair of the Executive Board



Amanda Warner, MS, RN, OCN

President/Managing Director | Real-World Evidence



Janet McNaughton, MD

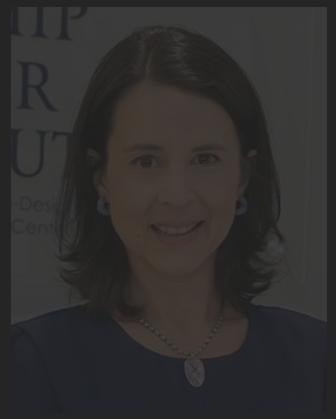
Associate Pathologist

*Formerly at Emory

EFFICIENT

Faculty

EMORY UNIVERSITY



Jane Meisel, MD, FASCO

(C H A I R)

Professor | Hematology and Medical Oncology

Co-Director | Breast Medical Oncology,



Xiaoxian (Bill) Li, MD, PhD*

Professor and Chair

Department of Pathology and Laboratory Medicine

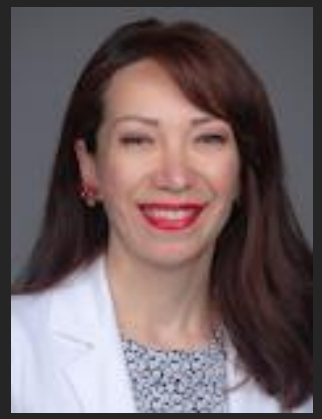
MOFFITT CANCER CENTER



Hatem Soliman MD

Senior Member | Breast Oncology and Immunology Departments

Medical Director, Clinical Trials Office

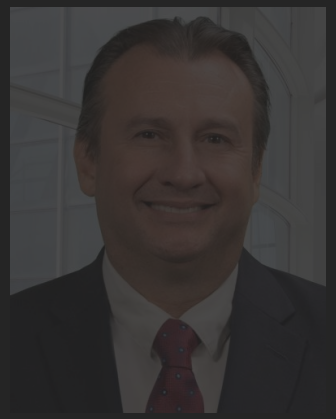


Zena Jameel, MD

Interim Director | Breast Pathology Associate Member

Director of Oncologic Surgical Pathology Fellowship

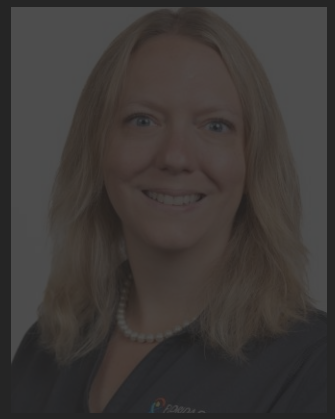
FLORIDA CANCER SPECIALISTS



Lucio N. Gordan, MD

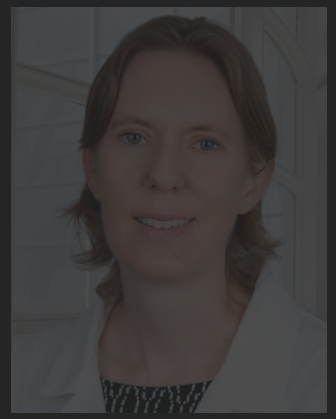
President/Managing Physician

Chair of the Executive Board



Amanda Warner, MS, RN, OCN

President/Managing Director | Real-World Evidence



Janet McNaughton, MD

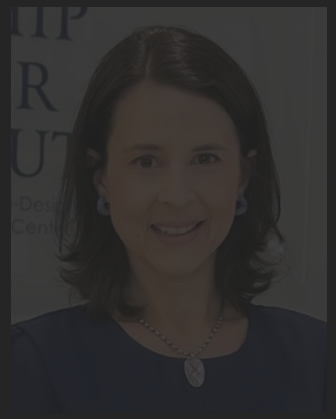
Associate Pathologist

*Formerly at Emory

EFFICIENT

Faculty

EMORY UNIVERSITY

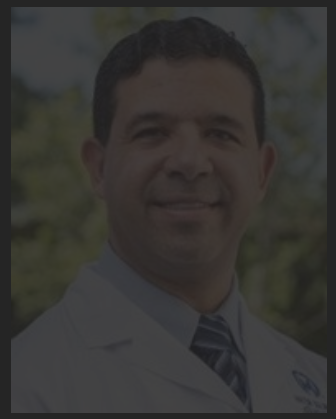


Jane Meisel, MD, FASCO
(CHAIR)
Professor | Hematology and Medical Oncology
Co-Director | Breast Medical Oncology,

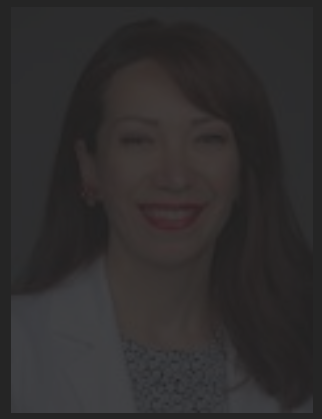


Xiaoxian (Bill) Li, MD, PhD*
Professor and Chair
Department of Pathology and Laboratory Medicine

MOFFITT CANCER CENTER



Hatem Soliman MD
Senior Member | Breast Oncology and Immunology Departments
Medical Director, Clinical Trials Office



Zena Jameel, MD
Interim Director | Breast Pathology Associate Member
Director of Oncologic Surgical Pathology Fellowship

FLORIDA CANCER SPECIALISTS



Lucio N. Gordan, MD
President/Managing Physician
Chair of the Executive Board



Amanda Warner, MS, RN, OCN
President/Managing Director | Real-World Evidence



Janet McNaughton, MD
Associate Pathologist

*Formerly at Emory

EFFICIENT

Faculty

EMORY UNIVERSITY



Jane Meisel, MD, FASCO
(C H A I R)

Professor | Hematology and Medical Oncology

Co-Director | Breast Medical Oncology,

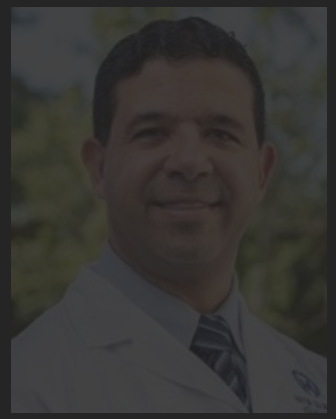


Xiaoxian (Bill) Li, MD, PhD*

Professor and Chair

Department of Pathology and Laboratory Medicine

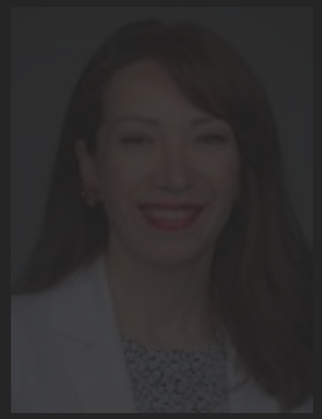
MOFFITT CANCER CENTER



Hatem Soliman MD

Senior Member | Breast Oncology and Immunology Departments

Medical Director, Clinical Trials Office

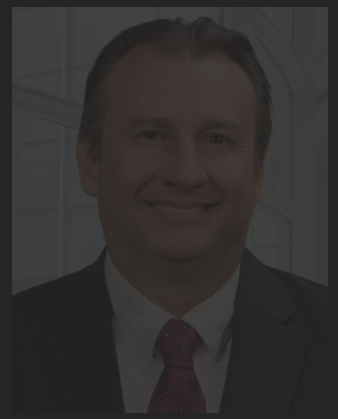


Zena Jameel, MD

Interim Director | Breast Pathology Associate Member

Director of Oncologic Surgical Pathology Fellowship

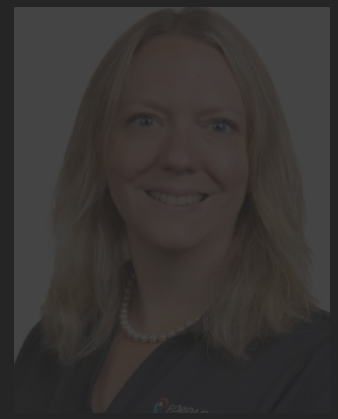
FLORIDA CANCER SPECIALISTS



Lucio N. Gordan, MD

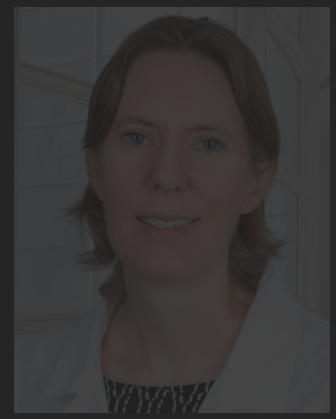
President/Managing Physician

Chair of the Executive Board



Amanda Warner, MS, RN, OCN

President/Managing Director | Real-World Evidence



Janet McNaughton, MD

Associate Pathologist

**Formerly at Emory*

EFFICIENT

Disclosures

DR MEISEL DISCLOSES THE FOLLOWING:

- **ADVISORY BOARD:** AstraZeneca, Olema Oncology, Pfizer Inc., and Sermonix Pharmaceuticals
- **RESEARCH:** AstraZeneca, Olema Oncology, Sermonix Pharmaceuticals
- **CONSULTING FEES:** AstraZeneca, Genetech, Inc., GSK, Novartis Pharmaceuticals Corporation, Olema Oncology, Pfizer Inc., Sermonix Pharmaceuticals

DR JAMEEL, DR GORDON, DR MCNAUGHTON AND MS WARNER

REPORT NO FINANCIAL RELATIONSHIPS TO DISCLOSE

DR LI DISCLOSES THE FOLLOWING:

- **ADVISORY BOARD:** Lilly and Roche
- **RESEARCH SUPPORT:** Champions Oncology, Inc.
- **CONSULTING FEES:** Cancer Expert Now, LLC

DR SOLIMAN DISCLOSES THE FOLLOWING:

- **ADVISORY BOARD:** AstraZeneca, Lilly, Novartis Pharmaceuticals Corporation, and Pfizer Inc./Arivinas

EFFICIENT

Learning Objectives

1. Employ current guidelines and expert recommendations for HER2 IHC scoring and other emerging assays to accurately identify patients with HER2-low/ultra-low mBC who may benefit from targeted therapy.

2. Facilitate enhanced communication and collaboration among pathologists, oncologists, and other members of the cancer care team to improve timely and accurate reporting of individual patient and tumor HER2 status

EFFICIENT



A DISCUSSION WITH
MOFFITT CANCER CENTER

EFFICIENT

Faculty: Moffitt Cancer Center



Hatem Soliman MD

Senior Member Breast Oncology and Immunology Departments

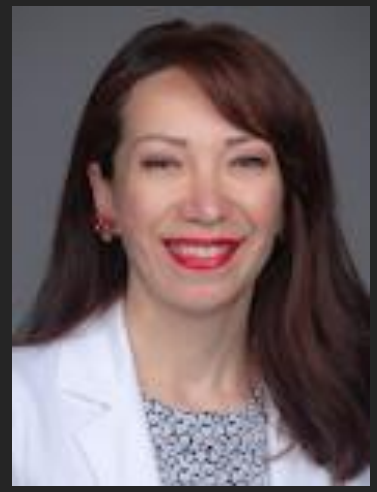
Medical Director | Clinical Trials Office

Moffitt Cancer Center

Professor | Department of Oncologic Sciences, College of Medicine

University of South Florida

Tampa, FL USA



Zena Jameel, MD

Interim Director | Breast Pathology Associate Member

Director of Oncologic Surgical Pathology Fellowship

Moffitt Cancer Center

Associate Professor

University of South Florida

Tampa, FL

Faculty: Moffitt Cancer Center



Hatem Soliman MD

Senior Member Breast Oncology and Immunology Departments

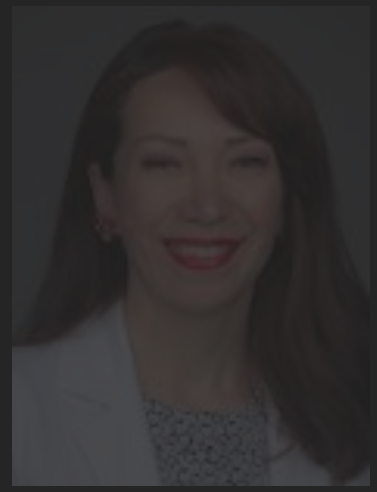
Medical Director | Clinical Trials Office

Moffitt Cancer Center

Professor | Department of Oncologic Sciences, College of Medicine

University of South Florida

Tampa, FL USA



Zena Jameel, MD

Interim Director | Breast Pathology Associate Member

Director of Oncologic Surgical Pathology Fellowship

Moffitt Cancer Center

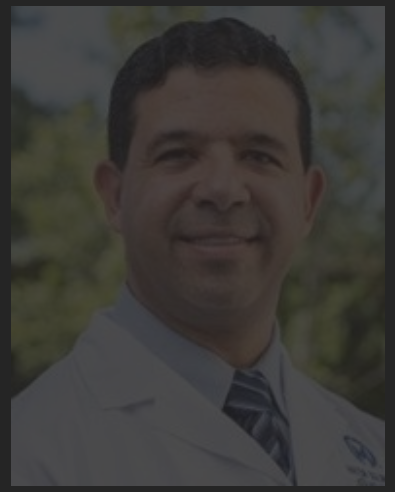
Associate Professor

University of South Florida

Tampa, FL

EFFICIENT

Faculty: Moffitt Cancer Center



Hatem Soliman MD

Senior Member Breast Oncology and Immunology Departments

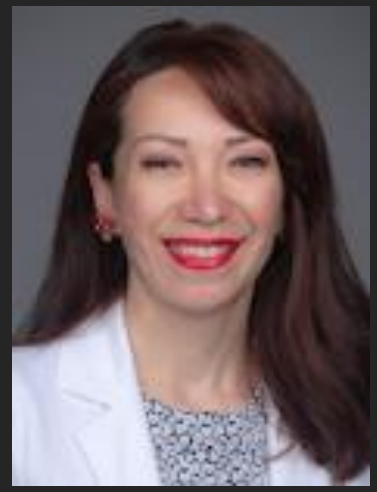
Medical Director | Clinical Trials Office

Moffitt Cancer Center

Professor | Department of Oncologic Sciences, College of Medicine

University of South Florida

Tampa, FL USA



Zena Jameel, MD

Interim Director | Breast Pathology Associate Member

Director of Oncologic Surgical Pathology Fellowship

Moffitt Cancer Center

Associate Professor

University of South Florida

Tampa, FL

EFFICIENT

HER2 TESTING WORKFLOW

MOFFITT CANCER CENTER

IN HOUSE TESTING

Receive sample

Diagnosis (e.g., breast carcinoma)

Test for breast receptors (ER, PR, **HER2**)

Immunohistochemistry (IHC)

RESULT DEPENDENT:
Reflex ISH with dual probe ISH testing (not fluorescent)

Reports uploaded immediately to EHR

OUTSIDE TESTING

Receive sample

Review slides, confirm diagnosis

Re-interpret receptor results.
If unavailable, specifically indicate "per report"

IF DISCREPANCY,
request material and repeat testing

Reports uploaded immediately to EHR

EHR, electronic health record; **ER,** estrogen receptor; **ISH,** in situ hybridization; **PR,** progesterone receptor.

EFFICIENT

HER2 TESTING WORKFLOW

MOFFITT CANCER CENTER

IN HOUSE TESTING

Receive sample

Diagnosis (e.g., breast carcinoma)

Test for breast receptors (ER, PR, **HER2**)

Immunohistochemistry (IHC)

RESULT DEPENDENT:
Reflex ISH with dual probe ISH testing (not fluorescent)

Reports uploaded immediately to EHR

OUTSIDE TESTING

Receive sample

Review slides, confirm diagnosis

Re-interpret receptor results.
If unavailable, specifically indicate "per report"

IF DISCREPANCY,
request material and repeat testing

Reports uploaded immediately to EHR

EHR, electronic health record; **ER,** estrogen receptor; **ISH,** in situ hybridization; **PR,** progesterone receptor.

EFFICIENT

HER2 TESTING WORKFLOW

MOFFITT CANCER CENTER

IN HOUSE TESTING

Receive sample

Diagnosis (e.g., breast carcinoma)

Test for breast receptors (ER, PR, **HER2**)

Immunohistochemistry (IHC)

RESULT DEPENDENT:
Reflex ISH with dual probe ISH testing (not fluorescent)

Reports uploaded immediately to EHR

OUTSIDE TESTING

Receive sample

Review slides, confirm diagnosis

Re-interpret receptor results.
If unavailable, specifically indicate "per report"

IF DISCREPANCY,
request material and repeat testing

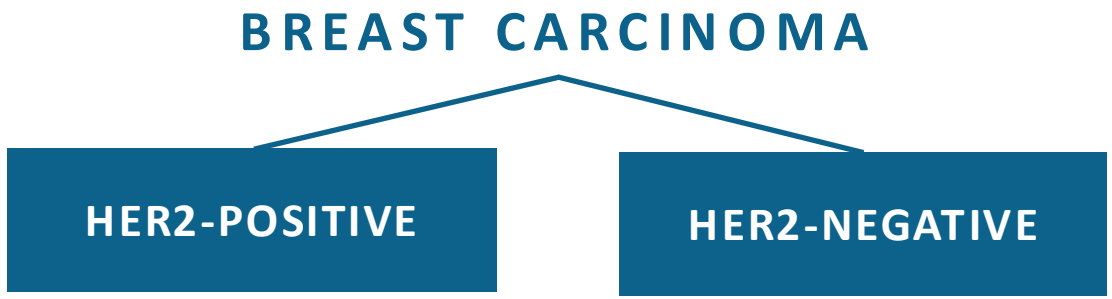
Reports uploaded immediately to EHR

EHR, electronic health record; **ER,** estrogen receptor; **ISH,** in situ hybridization; **PR,** progesterone receptor.

EFFICIENT

IMPACT OF DESTINY-BREAST TRIALS

PATHOLOGY REPORTING

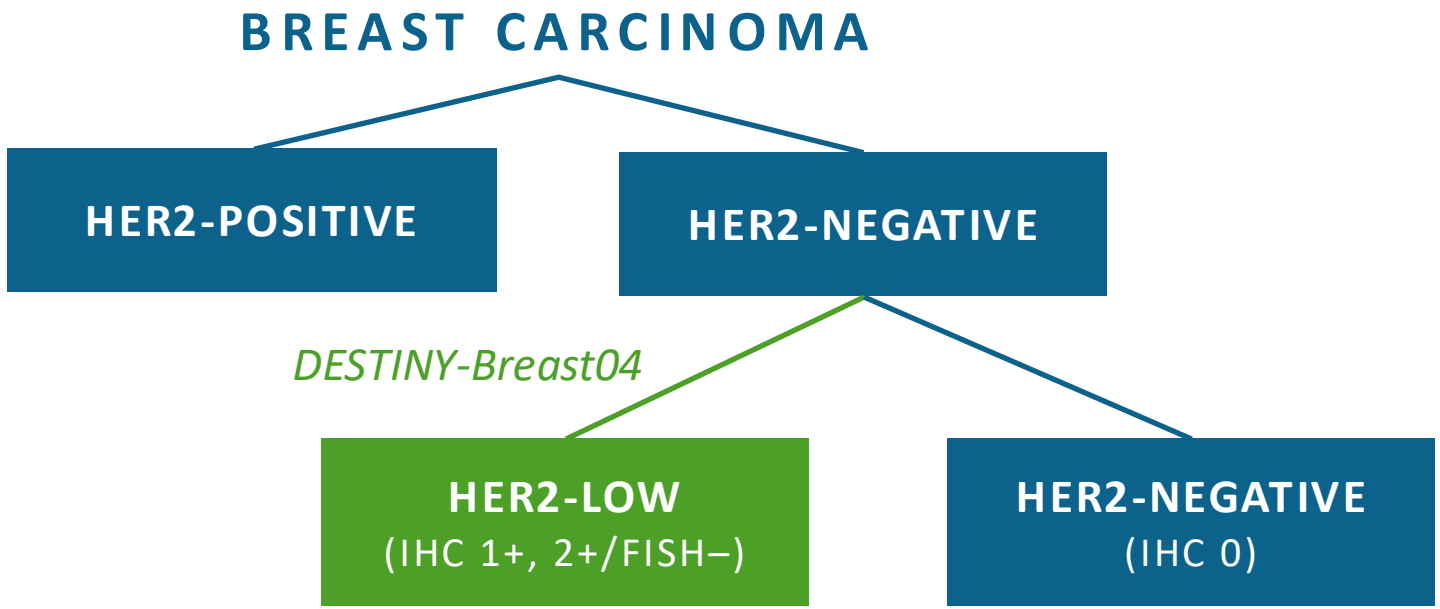


Curigliano G, et al. *Ann Oncol*. 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.

EFFICIENT

IMPACT OF DESTINY-BREAST TRIALS

PATHOLOGY REPORTING



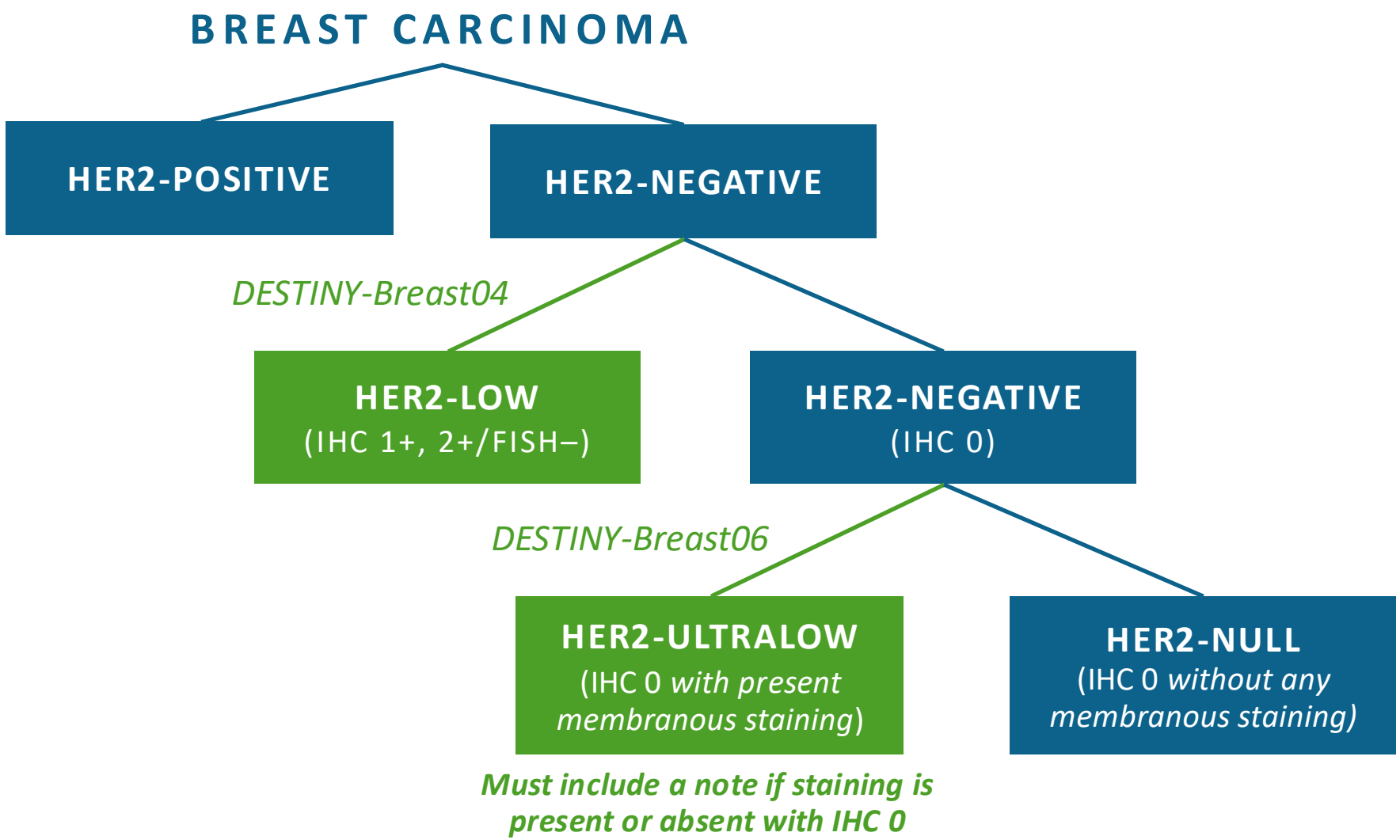
FISH, fluorescence in situ hybridization.

Curigliano G, et al. *Ann Oncol*. 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.

EFFICIENT

IMPACT OF DESTINY-BREAST TRIALS

PATHOLOGY REPORTING



FISH, fluorescence in situ hybridization.

Curigliano G, et al. *Ann Oncol*. 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.

EFFICIENT



FACULTY TIPS

If a new excision biopsy doesn't show HER2 staining:

- *Reinterpret/retest the core biopsy if performed before the DESTINY-Breast trials*

EFFICIENT



FACULTY TIPS

If a new excision biopsy doesn't show HER2 staining:

- *Reinterpret/retest the core biopsy if performed before the DESTINY-Breast trials*

If unstained slides have been stored > 6 weeks in a block that is not paraffin-embedded:

- *Do not use it*

EFFICIENT



FACULTY TIPS

If a new excision biopsy doesn't show HER2 staining:

- *Reinterpret/retest the core biopsy if performed before the DESTINY-Breast trials*

If unstained slides have been stored > 6 weeks in a block that is not paraffin-embedded:

- *Do not use it*

When reporting HER2 testing:

- *Use a templated report (with words and numbers to score)*

EFFICIENT

CASE: CLINICAL PRESENTATION

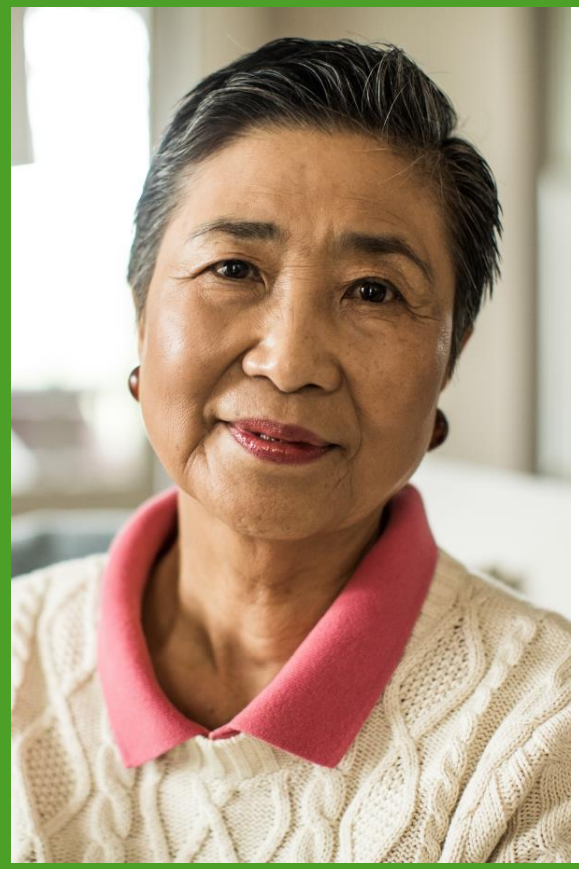
Based on a real medical case

HISTORY & PRESENTATION

DIAGNOSTIC WORKUP

PATHOLOGIC REASSESSMENT

INTERPRETATION & IMPLICATIONS



A 69-year-old woman presents with right breast carcinoma

- Postmenopausal
- No prior history of breast cancer
- Underwent diagnostic core biopsy of right breast mass

EFFICIENT

CASE: REVIEW OF OUTSIDE PATHOLOGY REPORT

Based on a real medical case

HISTORY & PRESENTATION

DIAGNOSTIC WORKUP

PATHOLOGIC REASSESSMENT

INTERPRETATION & IMPLICATIONS

Final Diagnosis:

The captioned slides, corresponding pathology reports have been reviewed as a second opinion to confirm the diagnosis.
SES25-03913, 09/23/2025, 10 SLIDES
A. RIGHT BREAST, 12 O'CLOCK 11 CM FROM NIPPLE, CORE BIOPSY:
Invasive ductal carcinoma, combined Nottingham Histologic Grade 2, measuring 1.4 cm in this material.
Ductal carcinoma in situ (DCIS), intermediate nuclear grade, solid pattern.

NOTE: Tumor profile performed by the contributor, provided for review:

Estrogen receptor:	POSITIVE (100%, 3+)
Progesterone receptor:	POSITIVE (100%, 3+)
HER-2 by IHC:	NEGATIVE (0) (ultra-low staining: not present) [control is weak]
HER-2 by DISH:	NEGATIVE (Per report, HER-2/CEN17 ratio: 1.02, average HER-2 copy number per cell: 1.86)
Ki-67:	10%

Images courtesy of Dr. Zena Jameel

DCIS, ductal carcinoma in situ, **ER,** estrogen receptor; **PR,** progesterone receptor; **DISH,** dual in situ hybridization; **CEN17,** centromere of chromosome 17

EFFICIENT

CASE: REVIEW OF OUTSIDE PATHOLOGY REPORT

Based on a real medical case

HISTORY & PRESENTATION

DIAGNOSTIC WORKUP

PATHOLOGIC REASSESSMENT

INTERPRETATION & IMPLICATIONS

Final Diagnosis:

The captioned slides, corresponding pathology reports have been reviewed as a second opinion to confirm the diagnosis.
SES25-03913, 09/23/2025, 10 SLIDES
A. RIGHT BREAST, 12 O'CLOCK 11 CM FROM NIPPLE, CORE BIOPSY:
Invasive ductal carcinoma, combined Nottingham Histologic Grade 2, measuring 1.4 cm in this material.
Ductal carcinoma in situ (DCIS), intermediate nuclear grade, solid pattern.

NOTE: Tumor profile performed by the contributor, provided for review:

Estrogen receptor:	POSITIVE (100%, 3+)
Progesterone receptor:	POSITIVE (100%, 3+)
HER-2 by IHC:	NEGATIVE (0) (ultra-low staining: not present) [control is weak]
HER-2 by DISH:	NEGATIVE (Per report, HER-2/CEN17 ratio: 1.02, average HER-2 copy number per cell: 1.86)
Ki-67:	10%

Repeat testing

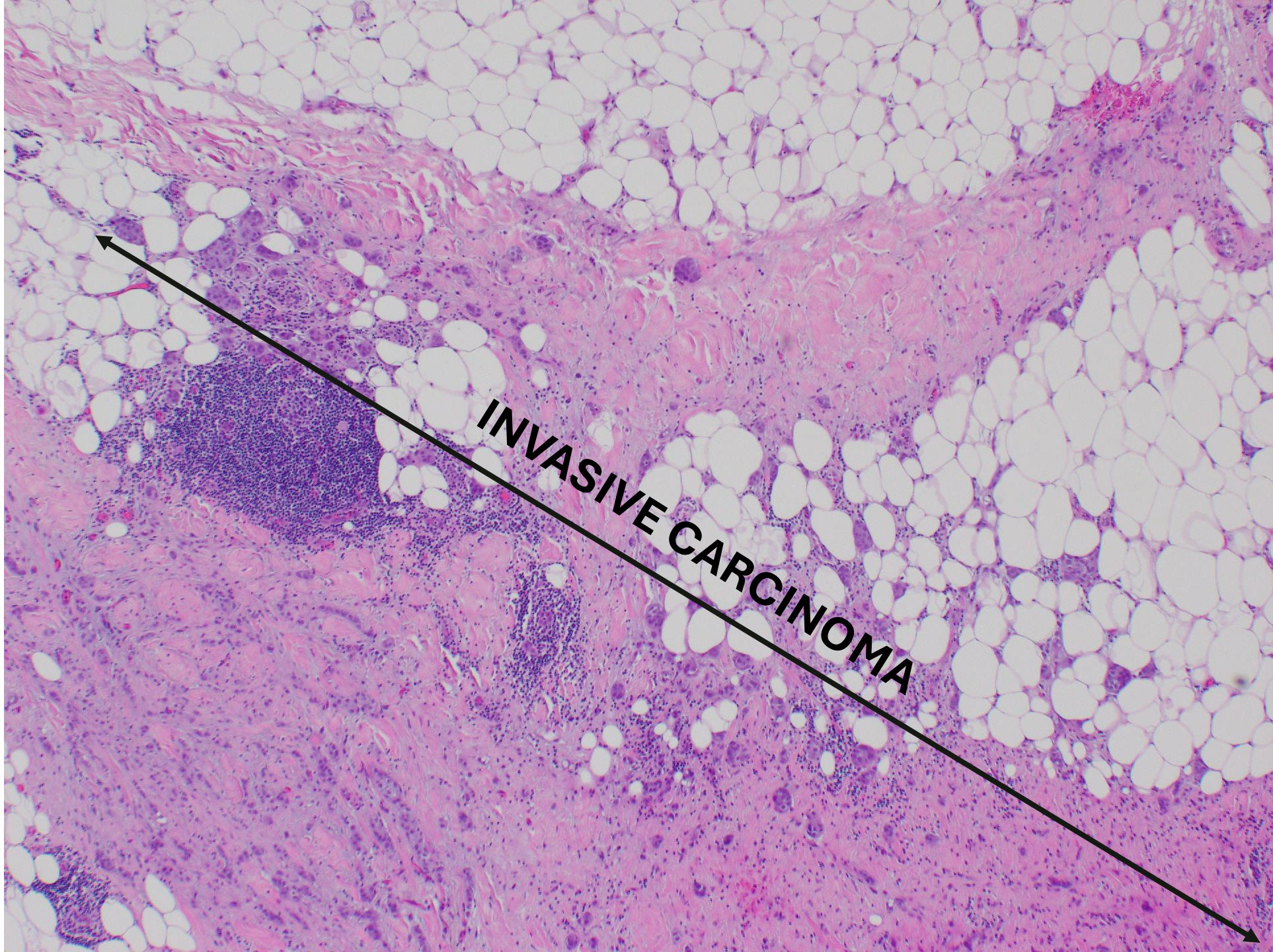
Images courtesy of Dr. Zena Jameel

DCIS, ductal carcinoma in situ, **ER,** estrogen receptor; **PR,** progesterone receptor; **DISH,** dual in situ hybridization; **CEN17,** centromere of chromosome 17

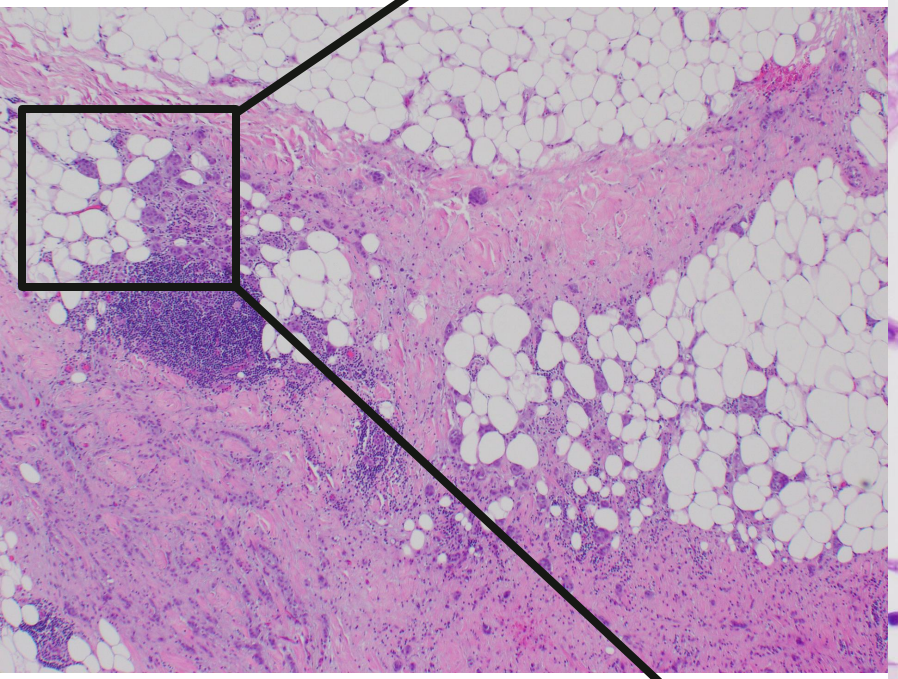
EFFICIENT

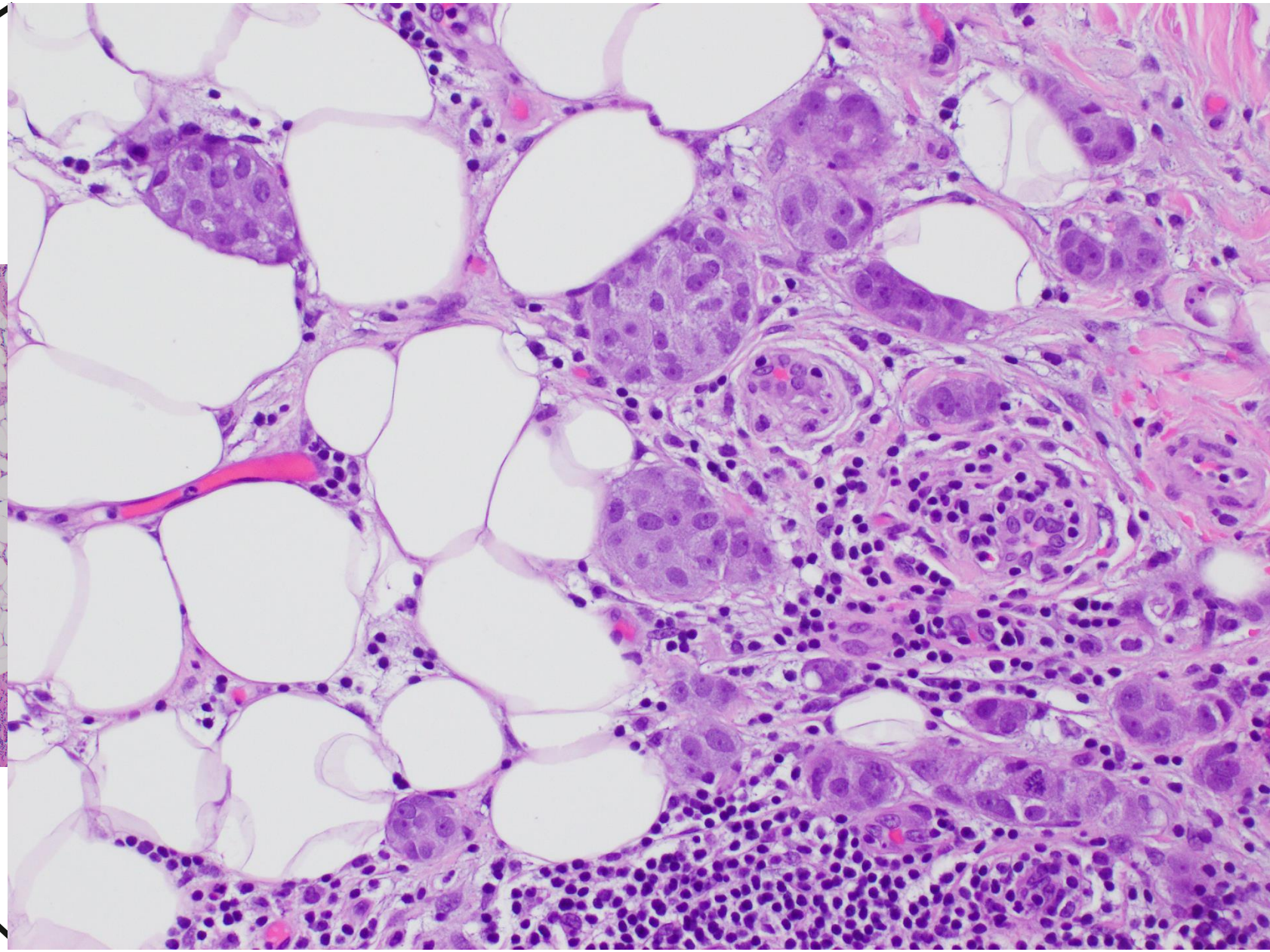
CASE

REPEAT TESTING



CASE
REPEAT TESTING





EFFICIENT

CASE: REPORTING

Based on a real medical case

HISTORY & PRESENTATION

DIAGNOSTIC WORKUP

PATHOLOGIC REASSESSMENT

INTERPRETATION & IMPLICATIONS

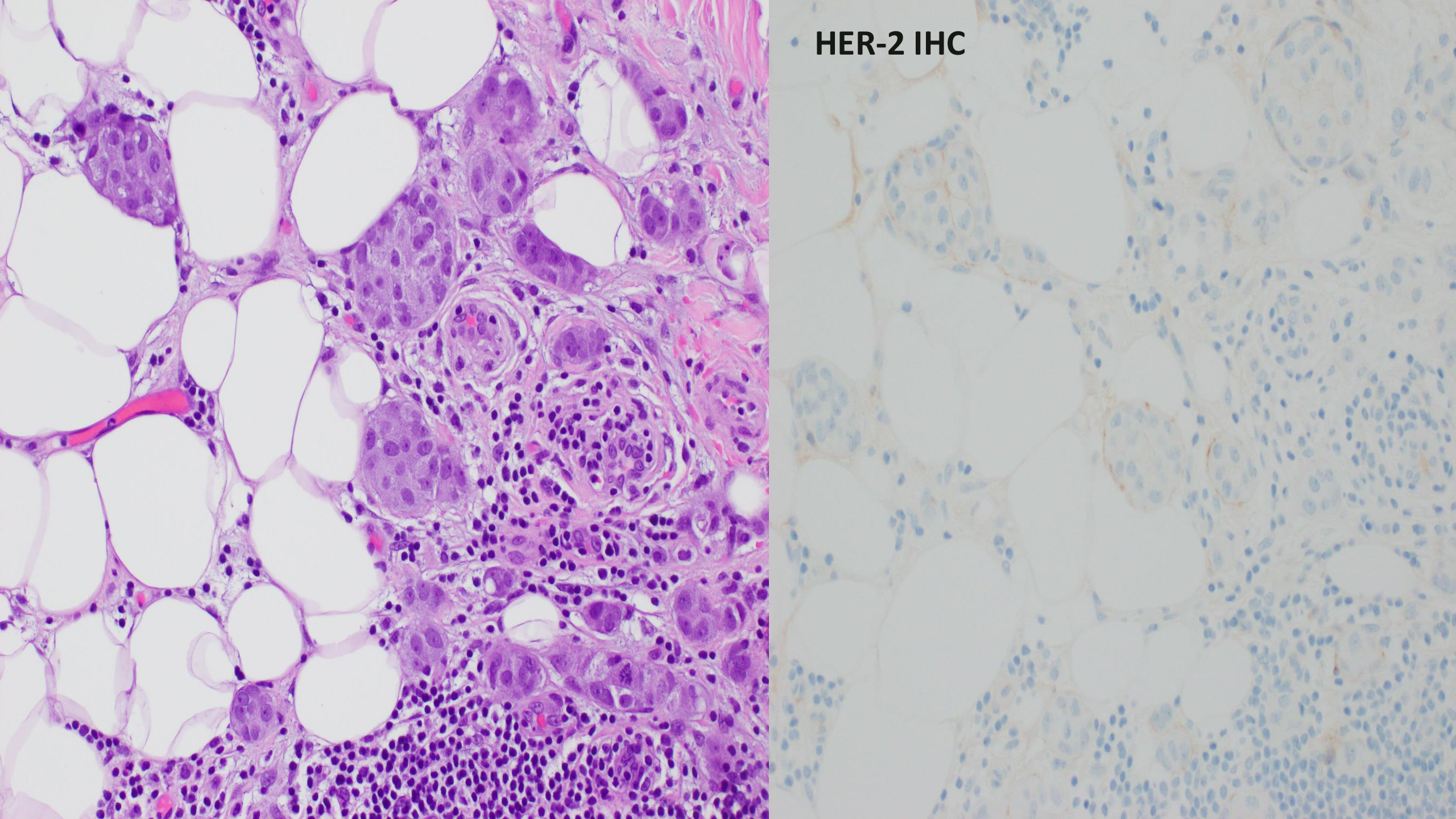
Addendum:
TEST NAME: BREAST CARCINOMA PROGNOSTIC / PREDICTIVE FACTORS ASSAYS
SPECIMEN DESCRIPTION: Formalin-fixed, paraffin-embedded tissue (Block A15)

Estrogen Receptor (ER):	Assay result: Positive Percent nuclear reactivity: 100% Staining intensity: 3+
Progesterone Receptor (PR):	Assay result: Positive Percent nuclear reactivity: 98% Staining intensity: 2+ & 3+

HER2/neu protein overexpression by immunohistochemistry (IHC):
Assay result: Negative (0) (ultra-low staining: present)

Images courtesy of Dr. Zena Jameel

EFFICIENT


HER-2 IHC

CASE: CONCLUSIONS

Based on a real medical case

HISTORY & PRESENTATION

DIAGNOSTIC WORKUP

PATHOLOGIC REASSESSMENT

INTERPRETATION & IMPLICATIONS



WHEN TO CONSIDER REPEAT TESTING IN A HER2-NEGATIVE RESULT

- Weak control; rasies questions about reliability
- Larger specimen; may be tumoral heterogeneity that reveals ultralow staining not seen on core
- HER2 equivocal; should prompt FISH or DISH testing

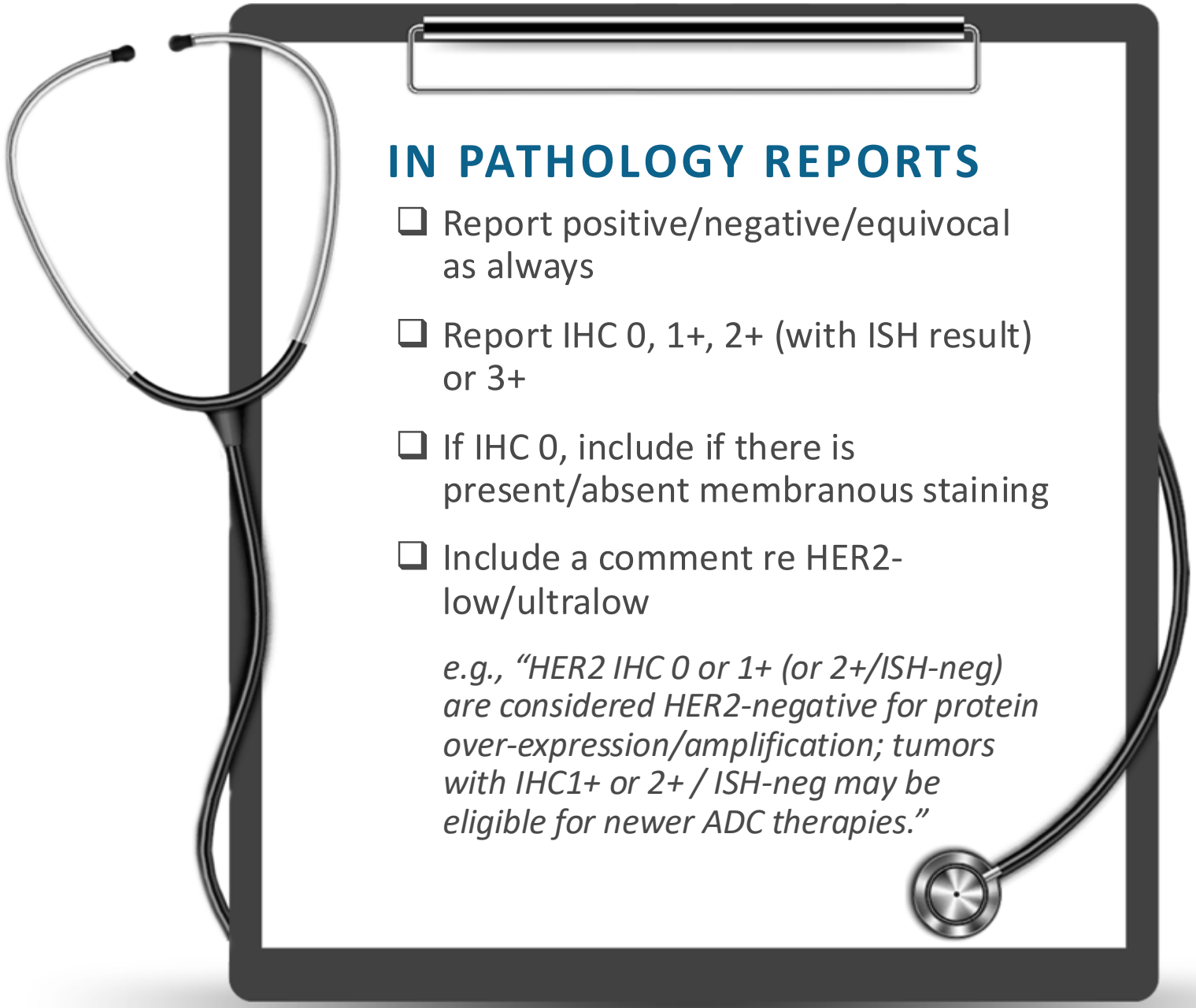
HIGHLIGHTS IMPORTANCE OF:

- Specimen selection
- Quality control
- Standardized reporting language
- Longitudinal HER2 documentation
- Communication

EFFICIENT

HER2 REPORTING

The 2023 ASCO-CAP guidance has ***not changed scoring thresholds for HER2 positivity***



IN PATHOLOGY REPORTS

- ❑ Report positive/negative/equivocal as always
- ❑ Report IHC 0, 1+, 2+ (with ISH result) or 3+
- ❑ If IHC 0, include if there is present/absent membranous staining
- ❑ Include a comment re HER2-low/ultralow

e.g., "HER2 IHC 0 or 1+ (or 2+/ISH-neg) are considered HER2-negative for protein over-expression/amplification; tumors with IHC1+ or 2+ / ISH-neg may be eligible for newer ADC therapies."

Wolff AC, et al. *Arch Pathol Lab Med.* 2023;147(9):993–1000.
ADC, antibody drug conjugate; **Neg,** negative.

EFFICIENT

ADDITIONAL HER2 IHC REPORTING SCENARIOS

INSIDE CASE

Specimens	A: Right Breast 1:00 6cmfn
Test(s) Performed:	
Estrogen receptor (ER) Status	
Low Positive (1-10% of cells with nuclear positivity)	Percentage of cells with nuclear positivity: 2%
Average Intensity of Staining	1+ Weak
Status of Internal Controls	Internal control cells absent
Test Type	Ventana Medical Systems
Primary Antibody	SP1
Progesterone Receptor (PgR) Status	
Negative (less than 1%)	Internal control cells absent
Test Type	Ventana Medical Systems
Primary Antibody	1E2
HER2 by Immunohistochemistry	Negative (Score 1+)
Test Type	Ventana Medical Systems
Primary Antibody	4B5
Ki-67	Percentage of cells with nuclear positivity: 40%
Primary Antibody	30.8
Cold Ischemia and Fixation Times	Meet requirements specified in latest version of the ASCO/CAP Guidelines
Cold Ischemia Time (minutes)	0.2
Fixation Time (hours)	6.9
Testing Performed on Block Number(s)	A2

OUTSIDE CASE

FINAL DIAGNOSIS

The captioned slides, corresponding pathology reports have been reviewed as a second opinion to confirm the diagnosis

9/5/2025, 10 slides

LEFT BREAST, MASS AT 2'OCLOCK, CORE BIOPSY:
Invasive ductal carcinoma, Nottingham Histologic Grade 1 (Glandular / Tubular Differentiation score: 1/ Nuclear pleomorphism score: 2/Mitotic rate score: 1) measuring 0.8cm in this material.

NOTE: Tumor profile performed by the contributor, **provided for review**:

Estrogen receptor	POSITIVE (60%, 2+)
Progesterone receptor	NEGATIVE (<1%)
HER-2 by IHC:	NEGATIVE (1+) [control is weak]
Ki-67:	5%

Recommend repeating receptors on resection specimen.

Adapted from images provided by Dr. Zena Jameel
ASCO/CAP, American Society of Clinical Oncology/College of American Pathologists.

EFFICIENT

ADDITIONAL HER2 IHC REPORTING SCENARIOS

INSIDE CASE	
Specimens	A: Right Breast 1:00 6cmfn
Test(s) Performed:	
Estrogen receptor (ER) Status	
Low Positive (1-10% of cells with nuclear positivity)	Percentage of cells with nuclear positivity: 2%
Average Intensity of Staining	1+ Weak
Status of Internal Controls	Internal control cells absent
Test Type	Ventana Medical Systems
Primary Antibody	SP1
Progesterone Receptor (PgR) Status	
Negative (less than 1%)	Internal control cells absent
Test Type	Ventana Medical Systems
Primary Antibody	1E2
HER2 by Immunohistochemistry	Negative (Score 1+)
Test Type	Ventana Medical Systems
Primary Antibody	4B5
Ki-67	Percentage of cells with nuclear positivity: 40%
Primary Antibody	30.8
Cold Ischemia and Fixation Times	Meet requirements specified in latest version of the ASCO/CAP Guidelines
Cold Ischemia Time (minutes)	0.2
Fixation Time (hours)	6.9
Testing Performed on Block Number(s)	A2

OUTSIDE CASE

FINAL DIAGNOSIS

The captioned slides, corresponding pathology reports have been reviewed as a second opinion to confirm the diagnosis

9/5/2025, 10 slides

LEFT BREAST, MASS AT 2'OCLOCK, CORE BIOPSY:
Invasive ductal carcinoma, Nottingham Histologic Grade 1 (Glandular / Tubular Differentiation score: 1/ Nuclear pleomorphism score: 2/Mitotic rate score: 1) measuring 0.8cm in this material.

NOTE: Tumor profile performed by the contributor, **provided for review**:

Estrogen receptor	POSITIVE (60%, 2+)
Progesterone receptor	NEGATIVE (<1%)
HER-2 by IHC:	NEGATIVE (1+) [control is weak]
Ki-67:	5%

Recommend repeating receptors on resection specimen.

Adapted from images provided by Dr. Zena Jameel
ASCO/CAP, American Society of Clinical Oncology/College of American Pathologists.

EFFICIENT

ADDITIONAL HER2 IHC REPORTING SCENARIOS

INSIDE CASE	
Specimens	A: Right Breast 1:00 6cmfn
Test(s) Performed:	
Estrogen receptor (ER) Status	
Low Positive (1-10% of cells with nuclear positivity)	Percentage of cells with nuclear positivity: 2%
Average Intensity of Staining	1+ Weak
Status of Internal Controls	Internal control cells absent
Test Type	Ventana Medical Systems
Primary Antibody	SP1
Progesterone Receptor (PgR) Status	
Negative (less than 1%)	Internal control cells absent
Test Type	Ventana Medical Systems
Primary Antibody	1E2
HER2 by Immunohistochemistry	Negative (Score 1+)
Test Type	Ventana Medical Systems
Primary Antibody	4B5
Ki-67	Percentage of cells with nuclear positivity: 40%
Primary Antibody	30.8
Cold Ischemia and Fixation Times	Meet requirements specified in latest version of the ASCO/CAP Guidelines
Cold Ischemia Time (minutes)	0.2
Fixation Time (hours)	6.9
Testing Performed on Block Number(s)	A2

OUTSIDE CASE

FINAL DIAGNOSIS

The captioned slides, corresponding pathology reports have been reviewed as a second opinion to confirm the diagnosis

9/5/2025, 10 slides

LEFT BREAST, MASS AT 2'OCLOCK, CORE BIOPSY:
Invasive ductal carcinoma, Nottingham Histologic Grade 1 (Glandular / Tubular Differentiation score: 1/ Nuclear pleomorphism score: 2/Mitotic rate score: 1) measuring 0.8cm in this material.

NOTE: Tumor profile performed by the contributor, **provided for review**:

Estrogen receptor	POSITIVE (60%, 2+)
Progesterone receptor	NEGATIVE (<1%)
HER-2 by IHC:	NEGATIVE (1+) [control is weak]
Ki-67:	5%

Recommend repeating receptors on resection specimen.

Adapted from images provided by Dr. Zena Jameel
ASCO/CAP, American Society of Clinical Oncology/College of American Pathologists.

EFFICIENT



A DISCUSSION WITH FLORIDA CANCER SPECIALISTS

EFFICIENT

Faculty: Florida Cancer Specialists



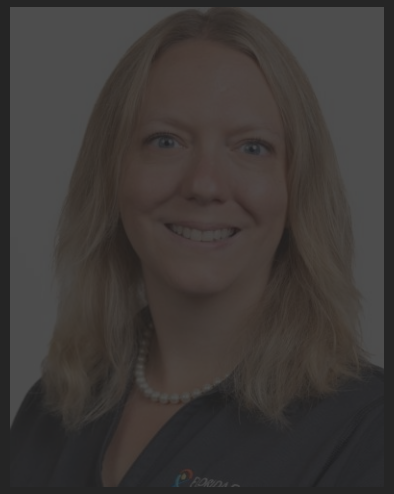
Lucio N. Gordan, MD

President/Managing Physician

Chair of the Executive Board

Florida Cancer Specialists & Research Institute

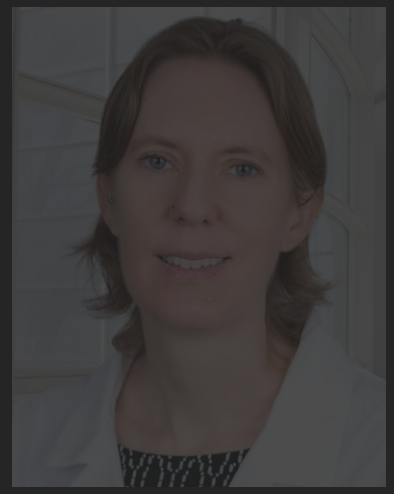
Gainesville, FL



Amanda Warner, MS, RN, OCN

President/Managing Director | Real-World Evidence

Florida Cancer Specialists & Research Institute, LLC



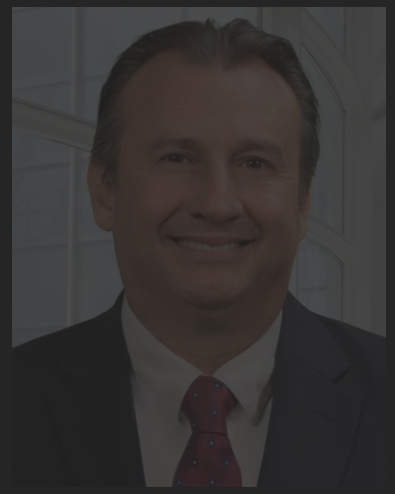
Janet McNaughton, MD

Associate Pathologist

Florida Cancer Center

EFFICIENT

Faculty: Florida Cancer Specialists



Lucio N. Gordan, MD

President/Managing Physician

Chair of the Executive Board

Florida Cancer Specialists & Research Institute

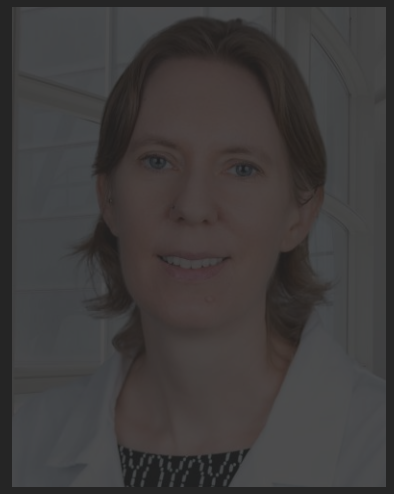
Gainesville, FL



Amanda Warner, MS, RN, OCN

President/Managing Director | Real-World Evidence

Florida Cancer Specialists & Research Institute, LLC



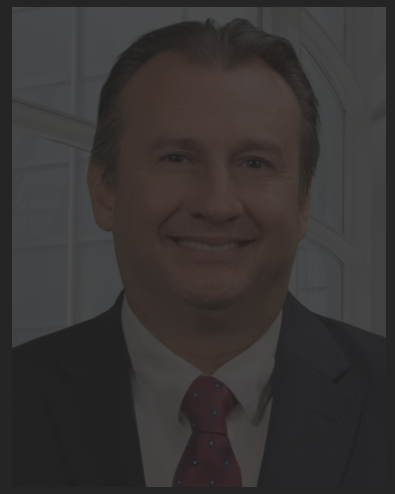
Janet McNaughton, MD

Associate Pathologist

Florida Cancer Center

EFFICIENT

Faculty: Florida Cancer Specialists



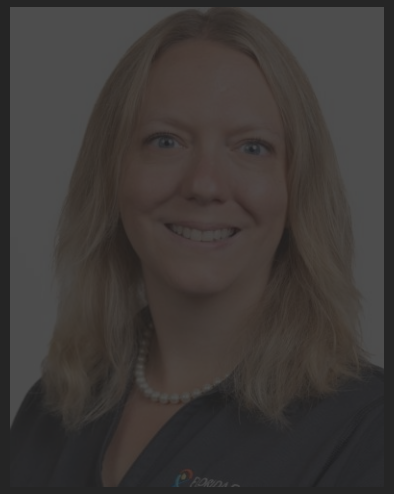
Lucio N. Gordan, MD

President/Managing Physician

Chair of the Executive Board

Florida Cancer Specialists & Research Institute

Gainesville, FL



Amanda Warner, MS, RN, OCN

President/Managing Director | Real-World Evidence

Florida Cancer Specialists & Research Institute, LLC



Janet McNaughton, MD

Associate Pathologist

Florida Cancer Center

EFFICIENT



FACULTY DISCUSSION

How have the DESTINY-Breast04 and DESTINY-Breast06 trials changed your approach to HER2 testing in mBC?

EFFICIENT

QUALITY IMPROVEMENT INTERVENTION

AI-ENABLED HER2-LOW mBC PATIENT NOTIFICATION PROGRAM

Patients with HER2-low mBC (IHC1+ or 2+/ISH-) identified in unstructured notes

COHORT 1 (N=62)	COHORT 2 (N=51)
Pre-intervention *Receiving CT any time from 1/1/20-10/23/22 and initiated new LOT* from 1/1/21-10/23/22*	Post-intervention *Receiving CT any time from 1/1/20-12/31/23 and initiated new LOT* from 10/25/22-12/31/23*

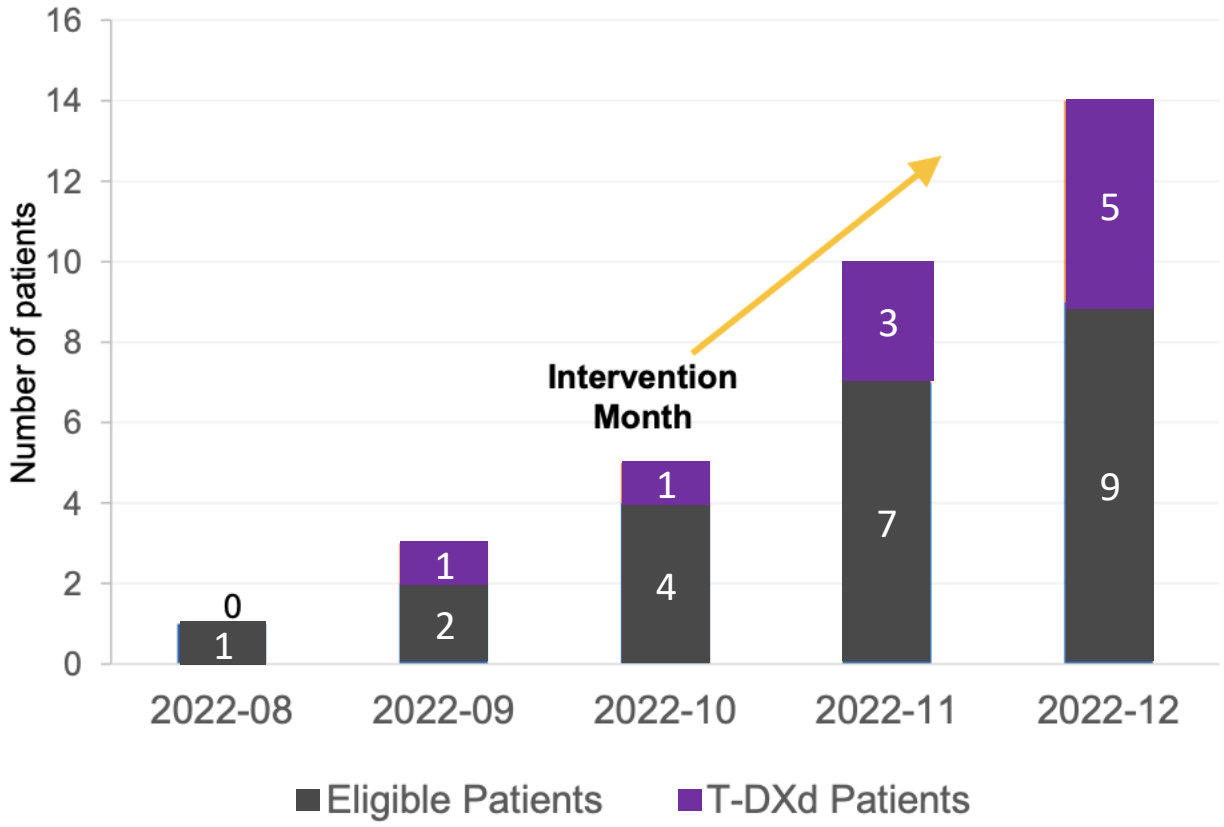
INTERVENTION:

AI-enabled notification that patient may qualify for T-DXd sent on 10/24/2022

CT, chemotherapy; **LOT,** line of therapy; **T-DXd,** trastuzumab deruxtecan.

Mehta S et al. *Clin Cancer Res*. 2026;32(4 Suppl):PS1-09-23.

T-DXD UPTAKE



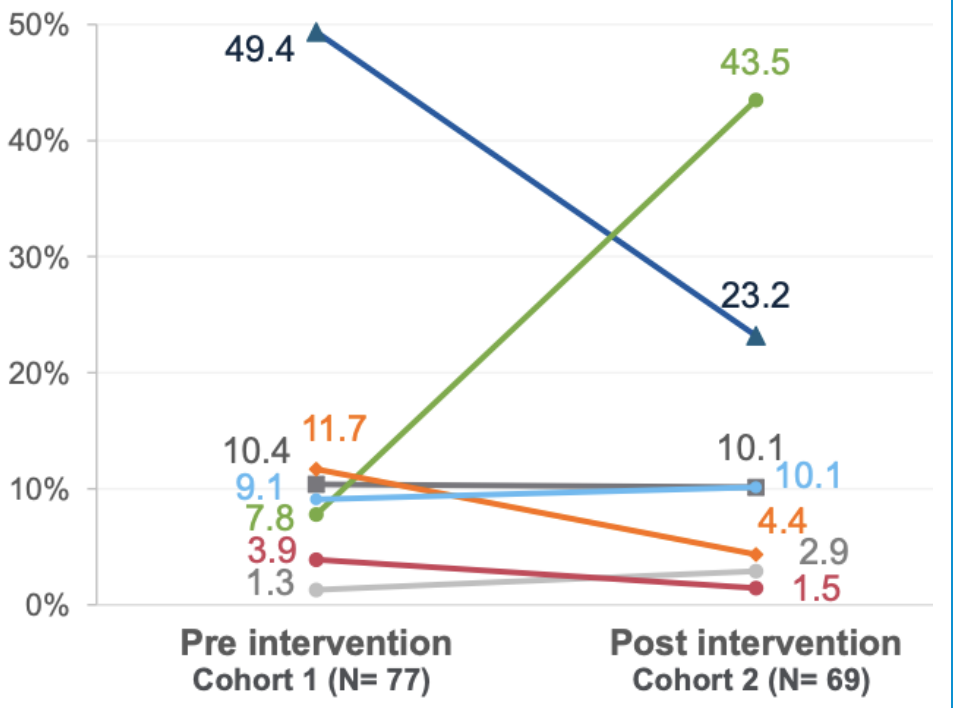
EFFICIENT

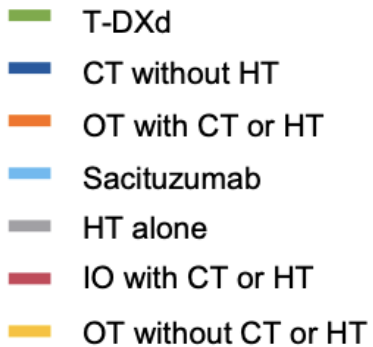
QUALITY IMPROVEMENT INTERVENTION

AI-ENABLED HER2-LOW mBC PATIENT NOTIFICATION PROGRAM

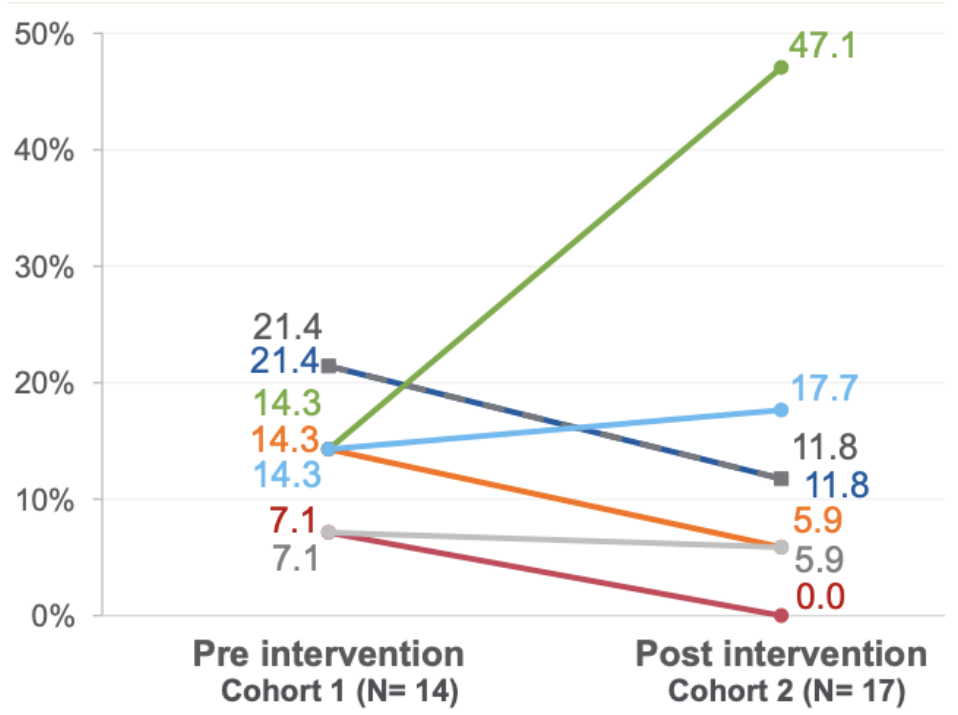
SUBSEQUENT REGIMEN POST-CHEMOTHERAPY

OVERALL HER2-LOW mBC PATIENTS





HER2-LOW NOTIFICATION PROGRAM



HT, hormone therapy; **IO,** immunotherapy; **OT,** other targeted therapy.

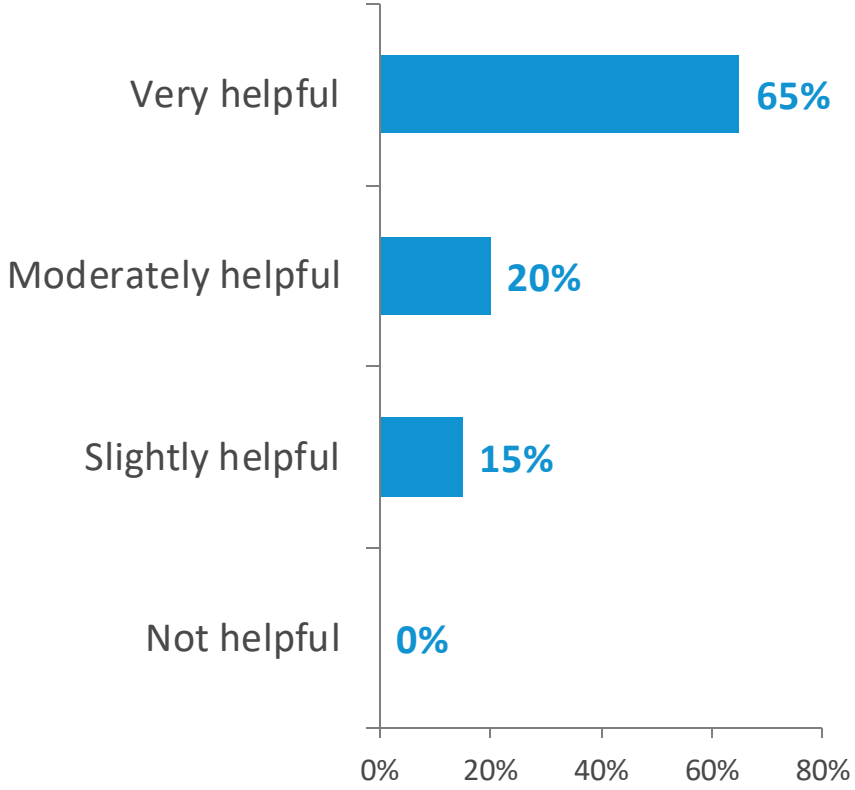
Mehta S et al. *Clin Cancer Res*. 2026;32(4 Suppl):PS1-09-23.

EFFICIENT

QUALITY IMPROVEMENT INTERVENTION

AI-ENABLED HER2-LOW mBC PATIENT NOTIFICATIONS

How helpful are these types of notification programs to assist with treatment sequencing and decision-making?



RECOMMENDED CHANGES FOR FUTURE QI PROGRAMS

- *Messages should include patient names and not encrypted MRNs*
- *More directed to patients eligible for change due to progression*
- *Avoid ALERT FATIGUE: integrate into EMR patient chart under a separate heading along with path results*

EMR, electronic medical record; **MRN,** medical record number.

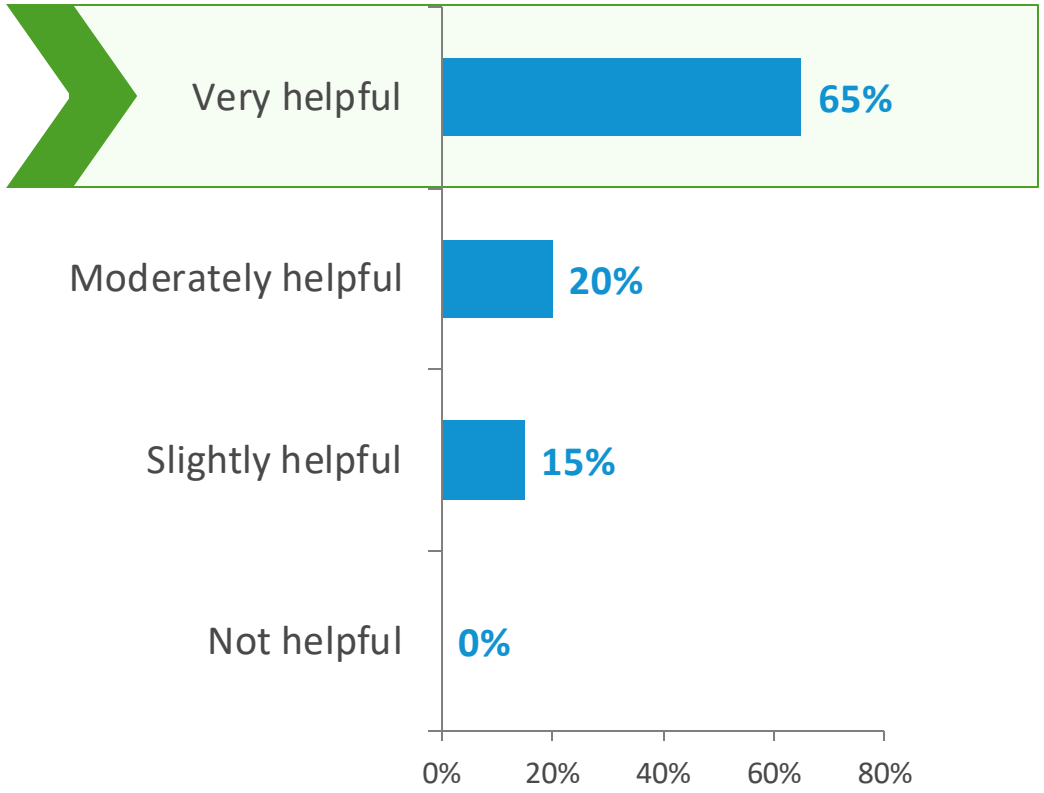
Mehta S et al. *Clin Cancer Res.* 2026;32(4 Suppl):PS1-09-23.

EFFICIENT

QUALITY IMPROVEMENT INTERVENTION

AI-ENABLED HER2-LOW mBC PATIENT NOTIFICATIONS

How helpful are these types of notification programs to assist with treatment sequencing and decision-making?



RECOMMENDED CHANGES FOR FUTURE QI PROGRAMS

- *Messages should include patient names and not encrypted MRNs*
- *More directed to patients eligible for change due to progression*
- *Avoid ALERT FATIGUE: integrate into EMR patient chart under a separate heading along with path results*

EMR, electronic medical record; **MRN,** medical record number.

Mehta S et al. *Clin Cancer Res.* 2026;32(4 Suppl):PS1-09-23.

EFFICIENT



FACULTY DISCUSSION

How do you ensure testing reliability and reporting consistency across multiple outside laboratories?

EFFICIENT



FACULTY DISCUSSION

How do you ensure testing reliability and reporting consistency across multiple outside laboratories?

- *Limit the number of outside laboratories*

EFFICIENT



FACULTY DISCUSSION

How do you ensure testing reliability and reporting consistency across multiple outside laboratories?

- *Limit the number of outside laboratories*
- *Call/check website to ensure*
  - *Proper technique (e.g., 10% neutral buffered formalin for 6-72 hours)*

EFFICIENT



FACULTY DISCUSSION

How do you ensure testing reliability and reporting consistency across multiple outside laboratories?

- *Limit the number of outside laboratories*
- *Call/check website to ensure*
  - *Proper technique (e.g., 10% neutral buffered formalin for 6-72 hours)*
  - *Use of validated assays and the FDA approved 4B5 clone*

EFFICIENT



FACULTY DISCUSSION

How do you ensure testing reliability and reporting consistency across multiple outside laboratories?

- *Limit the number of outside laboratories*
- *Call/check website to ensure*
  - *Proper technique (e.g., 10% neutral buffered formalin for 6-72 hours)*
  - *Use of validated assays and the FDA approved 4B5 clone*
  - *Use of the CAP reporting guidance*

EFFICIENT



FACULTY DISCUSSION

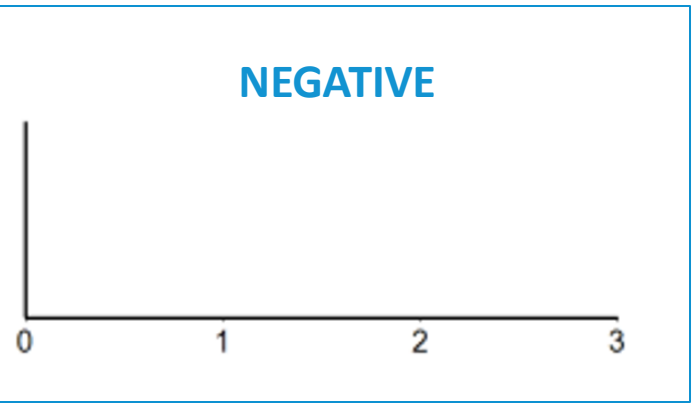
Essential elements for
standardized reporting templates

EFFICIENT

MINIMUM REPORTING
HER2-ULTRALOW

HER2 Breast	NEGATIVE
Score	0
Percentage of cells with uniform intense complete membrane staining	0%
Percentage of cells with ***incomplete membrane staining that is faint/barely perceptible***	**2%**

REFERENCE RANGES	
Positive	3+
Equivocal/low	2+
Negative/low	1+
Negative	0



COMMENTS:

The proposed HER2 ultra-low (UL) category includes breast cancer (BC) with incomplete or faint/barely perceptible membrane staining in >0 but ≤10% of tumor cells. Recent DESTINY-Breast06 Phase III trial showed that trastuzumab deruxtecan demonstrated a statistically significant and clinically meaningful improvement in progression-free survival (PFS) compared with standard-of-care chemotherapy in patients with HR-positive metastatic BC.

Please note that “HER2 UL” is not applicable to patients with invasive BC who are being considered for other HER2-directed therapies. In addition, the recent FDA expansion of approval to the ”HER2 Low” group was only based on clinical trial eligibility criteria rather than a new predictive indication for HER2 testing and similar limitations may apply to HER2 UL group.

Curigliano G, et al *Ann Oncol.* 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.

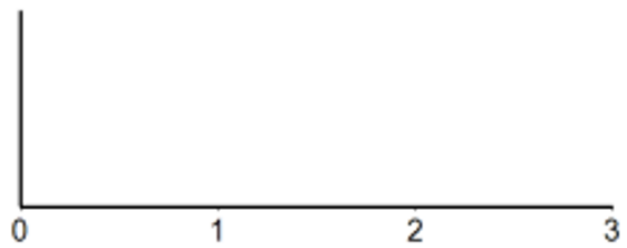
MINIMUM REPORTING
HER2-ULTRALOW

ADD DESCRIPTORS OF MEMBRANE STAINING

HER2 Breast	NEGATIVE
Score	0
Percentage of cells with uniform intense complete membrane staining	0%
Percentage of cells with ***incomplete membrane staining that is faint/barely perceptible***	**2%**

REFERENCE RANGES	
Positive	3+
Equivocal/low	2+
Negative/low	1+
Negative	0

NEGATIVE



COMMENTS:

The proposed HER2 ultra-low (UL) category includes breast cancer (BC) with incomplete or faint/barely perceptible membrane staining in >0 but ≤10% of tumor cells. Recent DESTINY-Breast06 Phase III trial showed that trastuzumab deruxtecan demonstrated a statistically significant and clinically meaningful improvement in progression-free survival (PFS) compared with standard-of-care chemotherapy in patients with HR-positive metastatic BC.

Please note that “HER2 UL” is not applicable to patients with invasive BC who are being considered for other HER2-directed therapies. In addition, the recent FDA expansion of approval to the ”HER2 Low” group was only based on clinical trial eligibility criteria rather than a new predictive indication for HER2 testing and similar limitations may apply to HER2 UL group.

Curigliano G, et al *Ann Oncol.* 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.

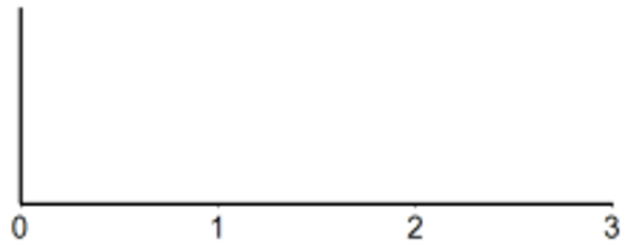
MINIMUM REPORTING
HER2-ULTRALOW

ADD DESCRIPTORS OF MEMBRANE STAINING

HER2 Breast	NEGATIVE
Score	0
Percentage of cells with uniform intense complete membrane staining	0%
Percentage of cells with ***incomplete membrane staining that is faint/barely perceptible***	**2%**

REFERENCE RANGES	
Positive	3+
Equivocal/low	2+
Negative/low	1+
Negative	0

NEGATIVE



COMMENTS:

The proposed HER2 ultra-low (UL) category includes breast cancer (BC) with incomplete or faint/barely perceptible membrane staining in >0 but ≤10% of tumor cells. Recent DESTINY-Breast06 Phase III trial showed that trastuzumab deruxtecan demonstrated a statistically significant and clinically meaningful improvement in progression-free survival (PFS) compared with standard-of-care chemotherapy in patients with HR-positive metastatic BC.

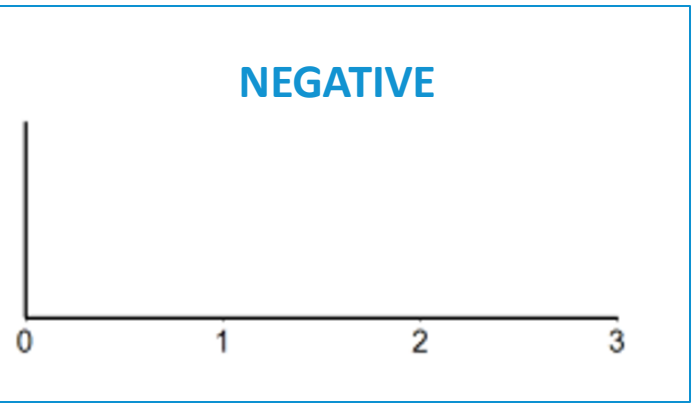
Please note that “HER2 UL” is not applicable to patients with invasive BC who are being considered for other HER2-directed therapies. In addition, the recent FDA expansion of approval to the ”HER2 Low” group was only based on clinical trial eligibility criteria rather than a new predictive indication for HER2 testing and similar limitations may apply to HER2 UL group.

Curigliano G, et al *Ann Oncol.* 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.

MINIMUM REPORTING
HER2-ULTRALOW

HER2 Breast	NEGATIVE
Score	0
Percentage of cells with uniform intense complete membrane staining	0%
Percentage of cells with ***incomplete membrane staining that is faint/barely perceptible***	**2%**

REFERENCE RANGES	
Positive	3+
Equivocal/low	2+
Negative/low	1+
Negative	0



COMMENTS:

The proposed HER2 ultra-low (UL) category includes breast cancer (BC) with incomplete or faint/barely perceptible membrane staining in >0 but ≤10% of tumor cells. **Recent DESTINY-Breast06 Phase III trial showed that trastuzumab deruxtecan demonstrated a statistically significant and clinically meaningful improvement** in progression-free survival (PFS) compared with standard-of-care chemotherapy in patients with HR-positive metastatic BC.

Please note that “HER2 UL” is not applicable to patients with invasive BC who are being considered for other HER2-directed therapies. In addition, the recent FDA expansion of approval to the ”HER2 Low” group was only based on clinical trial eligibility criteria rather than a new predictive indication for HER2 testing and similar limitations may apply to HER2 UL group.

Curigliano G, et al *Ann Oncol.* 2026:S0923-7534(26)00071-2. Modi S, et al. *Nat Med.* 2025;31(12):4205-4213.



FACULTY DISCUSSION

How can we improve scoring between pathologists?

EFFICIENT



FACULTY DISCUSSION

What real-world factors limit or complicate retesting in a community network?

EFFICIENT



REAL-WORLD FACTORS THAT COMPLICATE RETESTING



REAL-WORLD FACTORS THAT COMPLICATE RETESTING

1. Payers may limit laboratories that you can use

EFFICIENT



REAL-WORLD FACTORS THAT COMPLICATE RETESTING

1. Payers may limit laboratories that you can use
2. Insufficient cells or tissue obtained in the biopsy

EFFICIENT



REAL-WORLD FACTORS THAT COMPLICATE RETESTING

1. Payers may limit laboratories that you can use.
2. Insufficient cells or tissue obtained in the biopsy
3. Knowledge about the results of HER2 in the setting of DESTINY-Breast04 and Breast06

EFFICIENT



REAL-WORLD FACTORS THAT COMPLICATE RETESTING

1. Payers may limit laboratories that you can use.
2. Insufficient cells or tissue obtained in the biopsy
3. Knowledge about the results of HER2 in the setting of DESTINY-Breast04 and Breast06
4. Unclear reporting

EFFICIENT



REAL-WORLD FACTORS THAT COMPLICATE RETESTING

1. Payers may limit laboratories that you can use.
2. Insufficient cells or tissue obtained in the biopsy
3. Knowledge about the results of HER2 in the setting of DESTINY-Breast04 and Breast06
4. Unclear reporting
5. Lack of biopsiable sites

EFFICIENT



FACULTY DISCUSSION

What would you prioritize to support consistent HER2 reporting and patient identification?

EFFICIENT



FACULTY DISCUSSION

What would you prioritize to support consistent HER2 reporting and patient identification?

- *Communication*

EFFICIENT



FACULTY DISCUSSION

What would you prioritize to support consistent HER2 reporting and patient identification?

- *Communication*
- *Standardization*

EFFICIENT



A DISCUSSION WITH
EMORY UNIVERSITY*

**Note Dr Bill Li is no longer with Emory University*

EFFICIENT

Faculty: Emory University



Jane Meisel, MD, FASCO
(CHAIR)

Professor | Department of Hematology and Medical Oncology

Professor | Department of Gynecology & Obstetrics

Co-Director | Breast Medical Oncology, Department of Hematology and Medical Oncology

Emory University
School of Medicine

Atlanta, GA



Xiaoxian (Bill) Li, MD, PhD*

Professor and Chair

Department of Pathology and Laboratory Medicine

Brody Medical School

East Carolina University

Greenville, NC

**Former Director of Breast Pathology and the IHC Lab at Emory University*

EFFICIENT



FACULTY DISCUSSION

After DESTINY-Breast06, what changed in your reporting language/template to preserve eligibility for HER2-targeted therapy?

EFFICIENT

HER2 REPORTING

EXPERT CONSENSUS

Mod Pathol 39 (2026) 100925

MODERN PATHOLOGY

USCAP UNITED STATES AND CANADIAN ACADEMY OF PATHOLOGY
Advancing Pathology Together

Journal homepage: https://modernpathology.org/

Review Article

International Expert Consensus Recommendations for HER2 Reporting in Breast Cancer: Focus on HER2-Low and Ultralow Categories

Emad A. Rakha[a,b,*], Puay Hoon Tan[c], Mieke R. Van Bockstal[d], Kimberly H. Allison[e], Edi Brogi[f], Grace Callagy[g], Gábor Cserni[h], Shabnam Jaffer[i], Maria Pia Foschini[j], Helenice Gobbi[k], Janina Kulka[l], Xiaoxian Li[m], Elena Provenzano[n], Abeer M. Shaaban[o], Gary M. Tse[p], Zsuzsanna Varga[q], Anne Vincent-Salomon[r], Rin Yamaguchi[s], Wentao Yang[t], Soha ElSheikh[u], Rohit Bhargava[v], Marina De Brot[w], Rita Canas-Marques[x], Caterina Marchiò[y,z], Madhuri V. Warren[aa], Carolien H.M. van Deurzen[bb], Yasmeen Mir[cc], Rahul Deb[dd], Hannah Wen[ee], Ian O. Ellis[a,ff], Stuart J. Schnitt[gg], Sarah E. Pinder[hh], Wendy Raymond[ii], Cecily Quinn[jj]; On behalf of the UK National Coordinating Committee of Breast Pathology, the Association of Breast Pathology, the European Working Group for Breast Screening Pathology and the International Society of Breast Pathology

Rakha EA et al. *Mod Pathol.* 2026 Jan;39(1):100925.

EFFICIENT



FACULTY DISCUSSION

Which specimen types (e.g., core biopsy, excision, metastasis) most often drive treatment decision-making?

EFFICIENT



FACULTY DISCUSSION

Which specimen types (e.g., core biopsy, excision, metastasis) most often drive treatment decision-making?

- ***No HER2 expression:*** *may weight most recent metastatic biopsy more heavily*
- ***With HER2 expression:*** *Any specimen, even if distant, with HER2 expression should prompt consideration of T-DXd.*

EFFICIENT

CASE: CLINICAL PRESENTATION

Based on a real medical case

HISTORY & PRESENTATION

PATHOKOGY

RESULTS & RESPONSE



43-year-old woman with mBC to the lung, liver, lymph node and bone:

- Age 34 at diagnosis with stage I disease; Oncotype 23
  - ER-positive
  - PR-positive
  - HER2 0
- Received surgery/radiation and 5 years of tamoxifen → experienced progression 2 years after completion
  - ER 68%
  - PR 40%
  - HER2 0
- Received OFS/letrozole/ribociclib for 26 months prior to progression followed by fulvestrant/everolimus for 10 months and capectabine for 9 months

EFFICIENT

CASE: PATHOLOGY

Based on a real medical case

HISTORY & PRESENTATION

PATHOLOGY

RESULTS & RESPONSE



A. Lymph node, station 4R, fine-needle biopsy (Outside Case; 6/28/2021):
   - Malignant cells present
   - Metastatic carcinoma

B. Lymph node, station 10R, fine-needle biopsy (Outside Case; 6/28/2021):
   - Malignant cells present.
   - Metastatic carcinoma consistent with breast origin.
   - Submitted immunostains (GATA3+, ER+, TTF-1-, Napsin A-) supporting the diagnosis.

Result of biomarker testing (Slides provided for review)

ER	Positive (Moderate, 62%)
PR	Positive (Moderate, 37%)
HER2	Negative (0+) (faint membrane staining in ~5% of cells)

CONSIDERATIONS WITH HER2 STAINING

ASCO/CAP GUIDELINES

PRE-ANALYTICAL

- Less than 1 hour of cold ischemic time
- Fixed using a 10% neutral buffered formalin
- Fixation time of 6-72 hours

ANALYTICAL

- Use freshly cut tissues from FFPE blocks
- If not immediately used, store unstained at 2-8° or room temp (use within 4-6 weeks)
- Use the FDA-approved 4B5 antibody and well validated assay
- Use internal and external controls

POST-ANALYTICAL

- Undergo training in interpreting HER2 IHC stains
- If any question about staining, consult a second pathologist to have a consensus
- Avoid necrotic area, in situ carcinoma, and artifactual staining
- Ensure adequate tumor cells for evaluation (≥ 100)

FFPE, formalin-fixed paraffin-embedded | Wolff AC, et al. *Arch Pathol Lab Med*. 2018;142(11):1364-1382.

EFFICIENT

CONSIDERATIONS WITH HER2 STAINING

ASCO/CAP GUIDELINES

PRE-ANALYTICAL

- Less than 1 hour of cold ischemic time
- Fixed using a 10% neutral buffered formalin
- Fixation time of 6-72 hours

ANALYTICAL

- Use freshly cut tissues from FFPE blocks
- If not immediately used, store unstained at 2-8° or room temp (use within 4-6 weeks)
- Use the FDA-approved 4B5 antibody and well validated assay
- Use internal and external controls

POST-ANALYTICAL

- Undergo training in interpreting HER2 IHC stains
- If any question about staining, consult a second pathologist to have a consensus
- Avoid necrotic area, in situ carcinoma, and artifactual staining
- Ensure adequate tumor cells for evaluation (≥ 100)

FFPE, formalin-fixed paraffin-embedded | Wolff AC, et al. *Arch Pathol Lab Med*. 2018;142(11):1364-1382.

EFFICIENT

CONSIDERATIONS WITH HER2 STAINING

ASCO/CAP GUIDELINES

PRE-ANALYTICAL

- Less than 1 hour of cold ischemic time
- Fixed using a 10% neutral buffered formalin
- Fixation time of 6-72 hours

ANALYTICAL

- Use freshly cut tissues from FFPE blocks
- If not immediately used, store unstained at 2-8° or room temp (use within 4-6 weeks)
- Use the FDA-approved 4B5 antibody and well validated assay
- Use internal and external controls

POST-ANALYTICAL

- Undergo training in interpreting HER2 IHC stains
- If any question about staining, consult a second pathologist to have a consensus
- Avoid necrotic area, in situ carcinoma, and artifactual staining
- Ensure adequate tumor cells for evaluation (≥ 100)

FFPE, formalin-fixed paraffin-embedded | Wolff AC, et al. *Arch Pathol Lab Med*. 2018;142(11):1364-1382.

EFFICIENT

CONSIDERATIONS WITH HER2 STAINING

ASCO/CAP GUIDELINES

PRE-ANALYTICAL

- Less than 1 hour of cold ischemic time
- Fixed using a 10% neutral buffered formalin
- Fixation time of 6-72 hours

ANALYTICAL

- Use freshly cut tissues from FFPE blocks
- If not immediately used, store unstained at 2-8° or room temp (use within 4-6 weeks)
- Use the FDA-approved 4B5 antibody and well validated assay
- Use internal and external controls

POST-ANALYTICAL

- Undergo training in interpreting HER2 IHC stains
- If any question about staining, consult a second pathologist to have a consensus
- Avoid necrotic area, in situ carcinoma, and artifactual staining
- Ensure adequate tumor cells for evaluation (≥ 100)

FFPE, formalin-fixed paraffin-embedded | Wolff AC, et al. *Arch Pathol Lab Med*. 2018;142(11):1364-1382.

EFFICIENT



FACULTY TIPS TO RESOLVE AMBIGUITY

EFFICIENT



FACULTY TIPS TO RESOLVE AMBIGUITY

- If membrane staining isn't specified, re-evaluate (or re-test if unavailable)

EFFICIENT



FACULTY TIPS TO RESOLVE AMBIGUITY

- If membrane staining isn't specified, re-evaluate (or re-test if unavailable)
- Communicate!

EFFICIENT



FACULTY TIPS TO RESOLVE AMBIGUITY

- If membrane staining isn't specified, re-evaluate (or re-test if unavailable)
- Communicate!
- Standardize reporting so nothing is missed

EFFICIENT