

An Update on Breast Cancer Pathology

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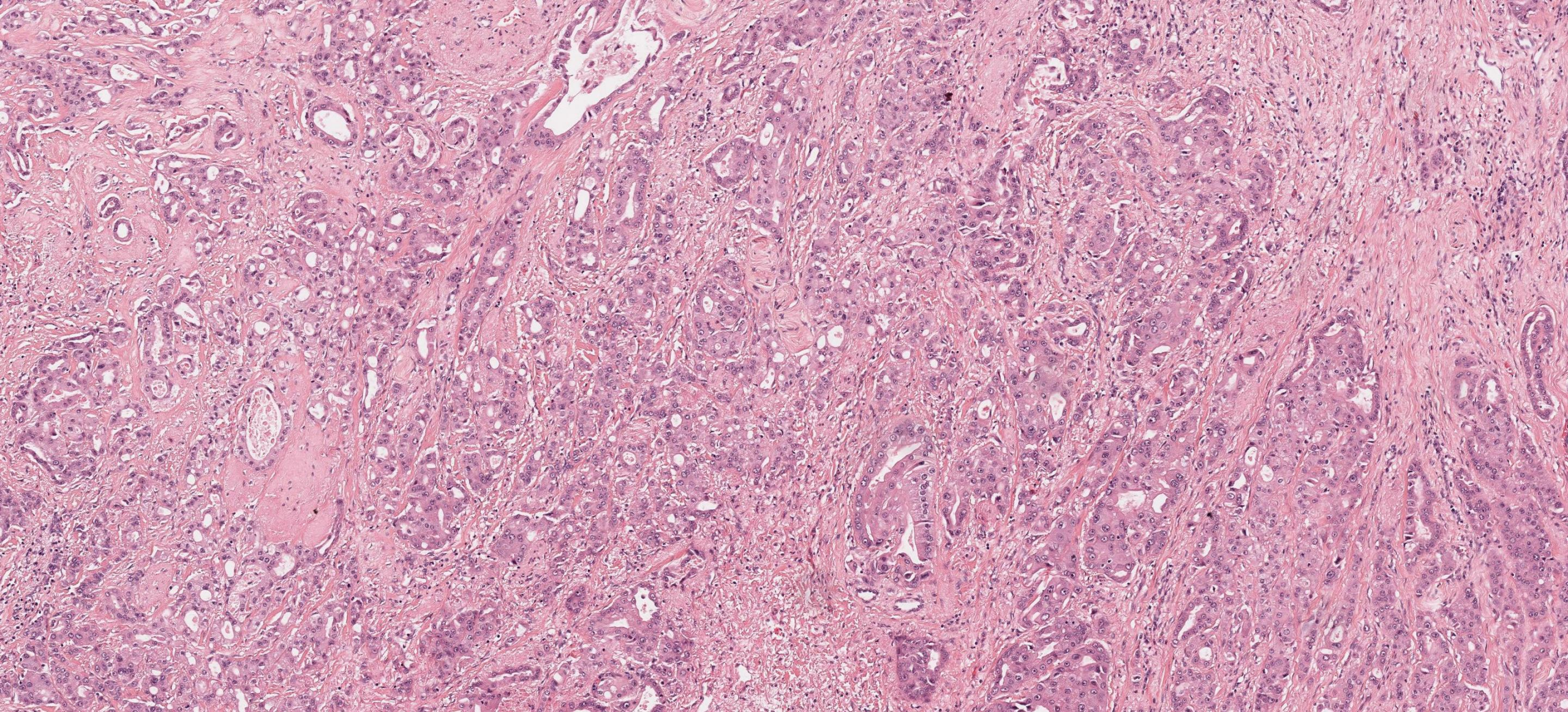
December 9, 2021

Your Pathology Report

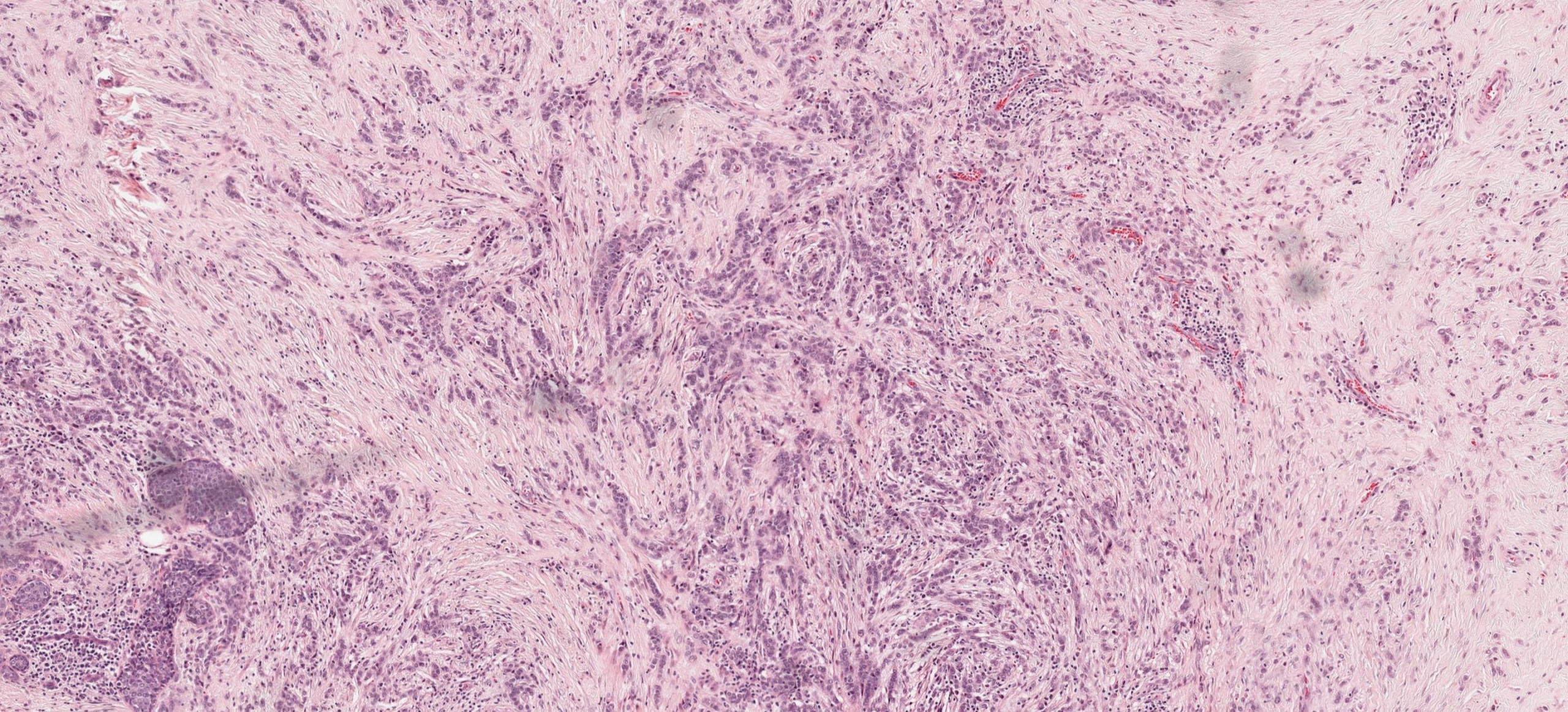
- 21st Century Cures Act – Access to health information
- Prognostic/Predictive Factors

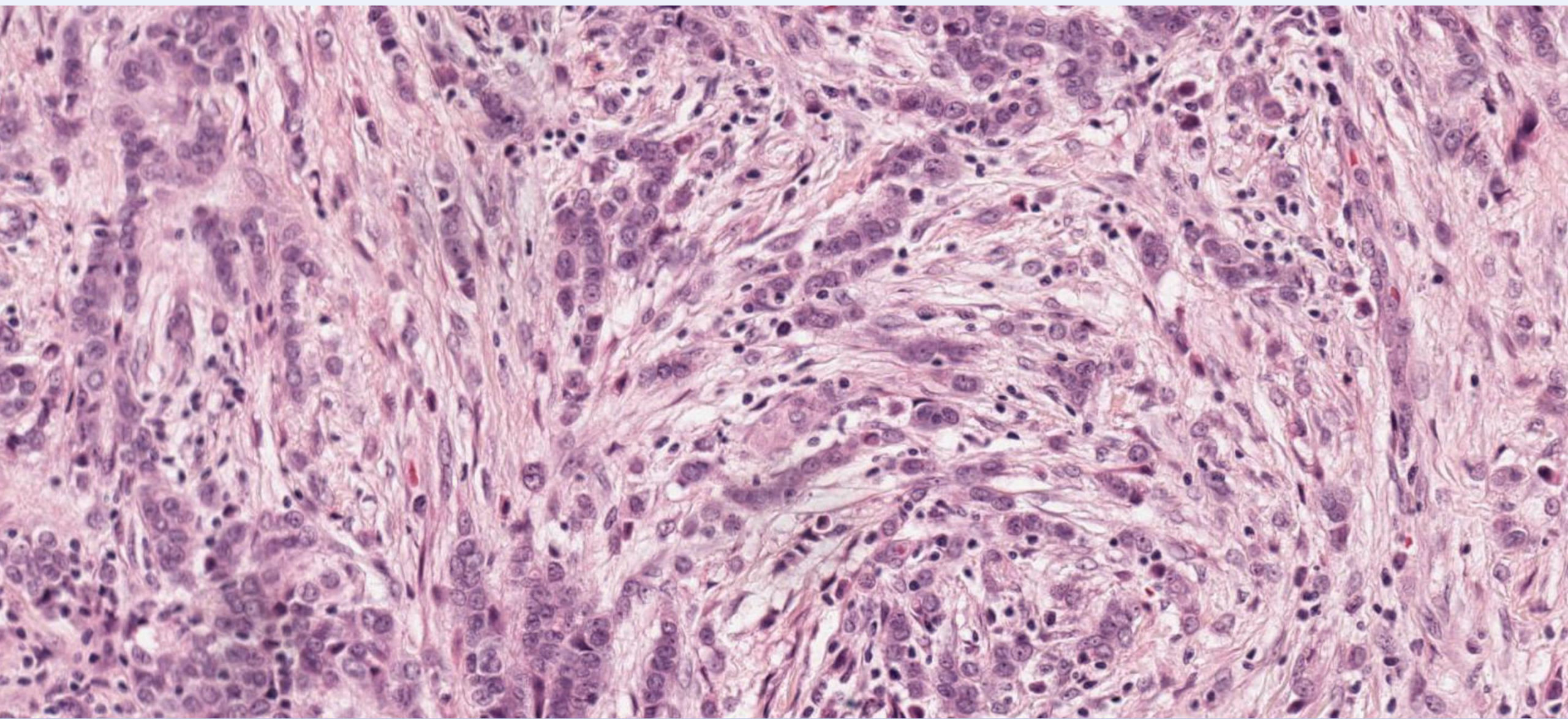
Histologic Subtype

Invasive Ductal Carcinoma



Invasive Lobular Carcinoma





Histopathologic Type - WHO Classification 5th Edition (2019)

In situ carcinomas

Ductal carcinoma in situ (DCIS) (low nuclear grade, intermediate nuclear grade, and high nuclear grade)

In situ papillary neoplasms (papillary DCIS, encapsulated papillary carcinoma, solid papillary carcinoma in situ)

Invasive Carcinomas

Invasive breast carcinoma of no special type (ductal and other special patterns)

Microinvasive carcinoma

Invasive lobular carcinoma

Tubular carcinoma

Cribriform carcinoma

Mucinous carcinoma

Mucinous cystadenocarcinoma

Invasive micropapillary carcinoma

Invasive papillary carcinoma

Invasive solid papillary carcinoma

Carcinoma with apocrine differentiation

Metaplastic carcinoma (spindle cell, squamous, with heterologous differentiation, low-grade adenosquamous carcinoma, low-grade fibromatosis-like and mixed metaplastic)

Neuroendocrine tumor (NET)

Neuroendocrine carcinoma (NEC)

Salivary gland-type (acinic cell, adenoid cystic, secretory, mucoepidermoid, polymorphous adenocarcinoma)

Tall cell carcinoma with reversed polarity

Favorable Histologic Types

Tubular carcinoma

Cribriform carcinoma

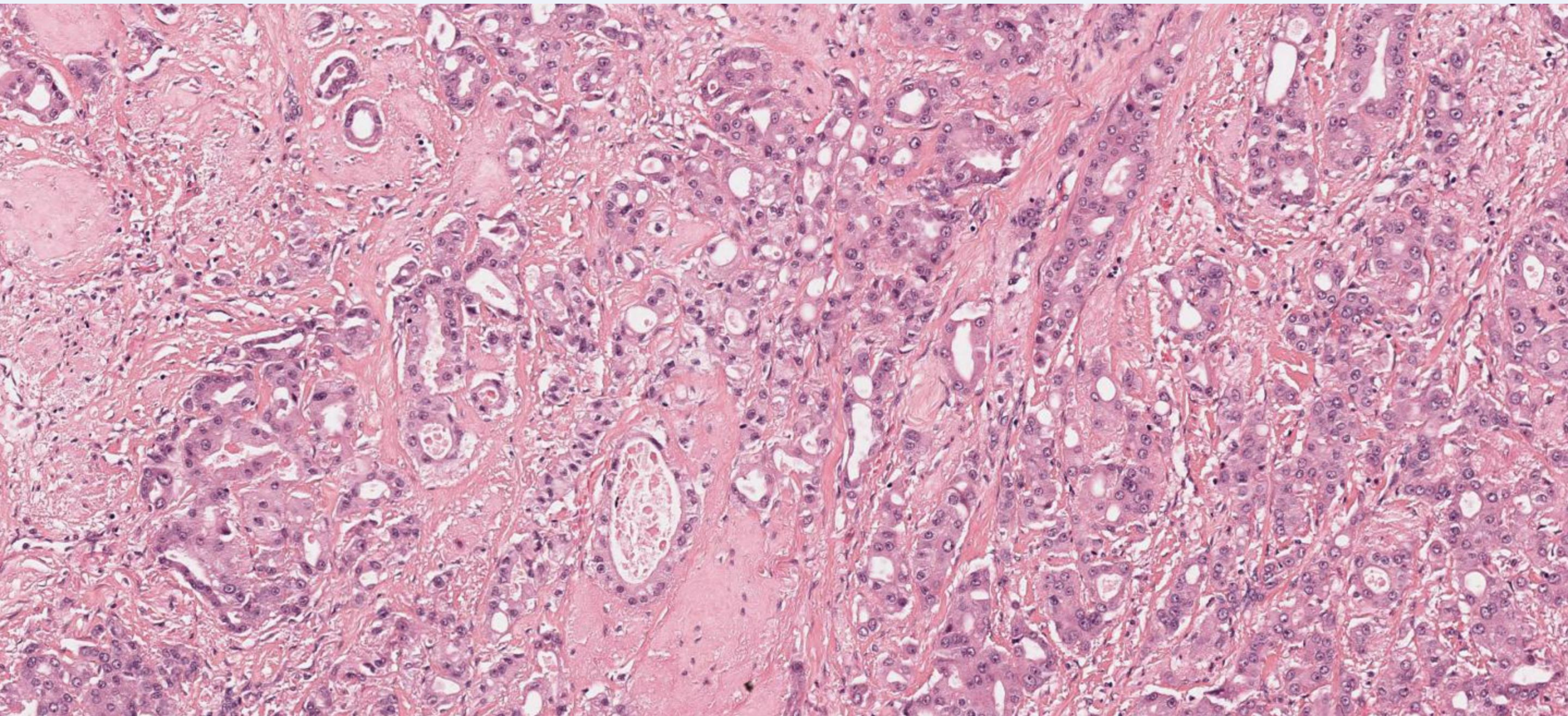
Mucinous carcinoma

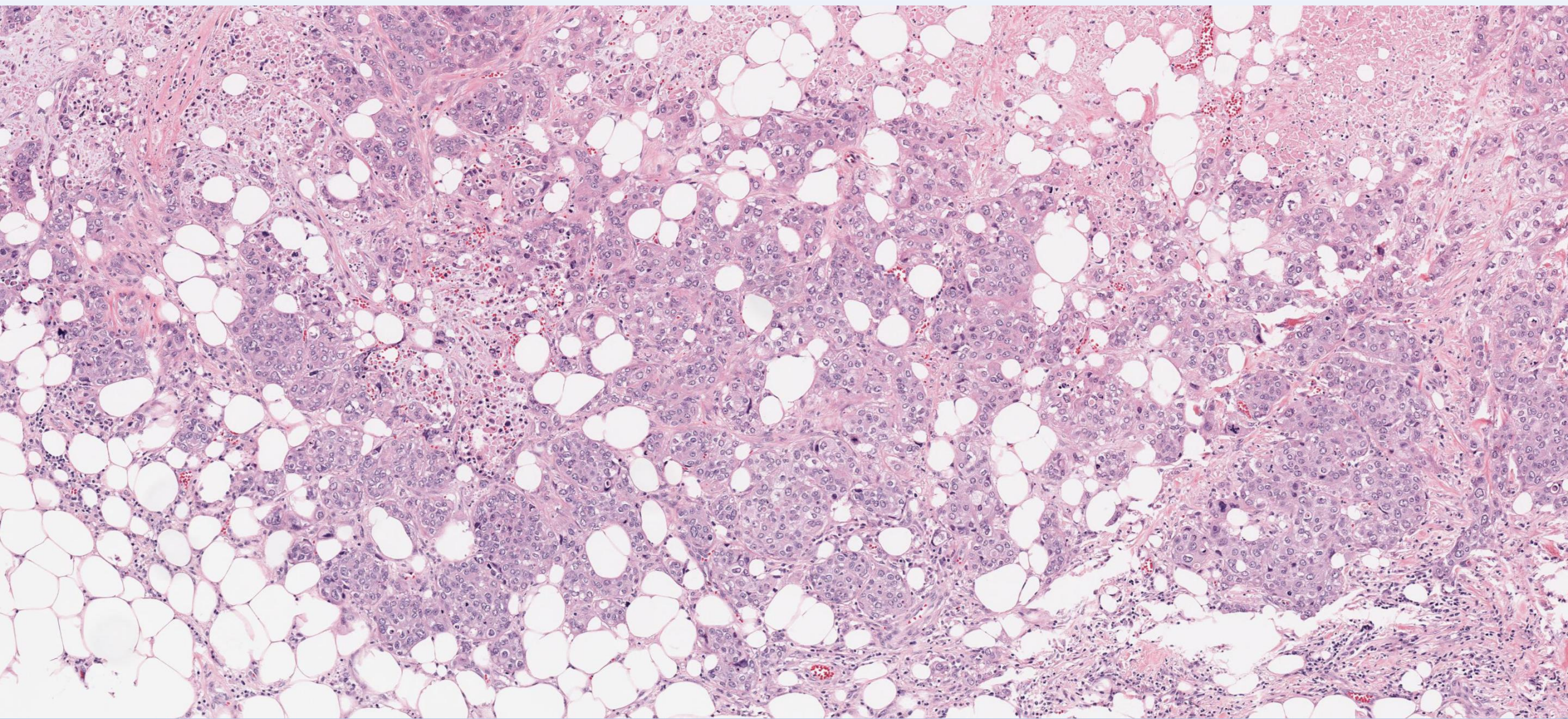
Adenoid cystic

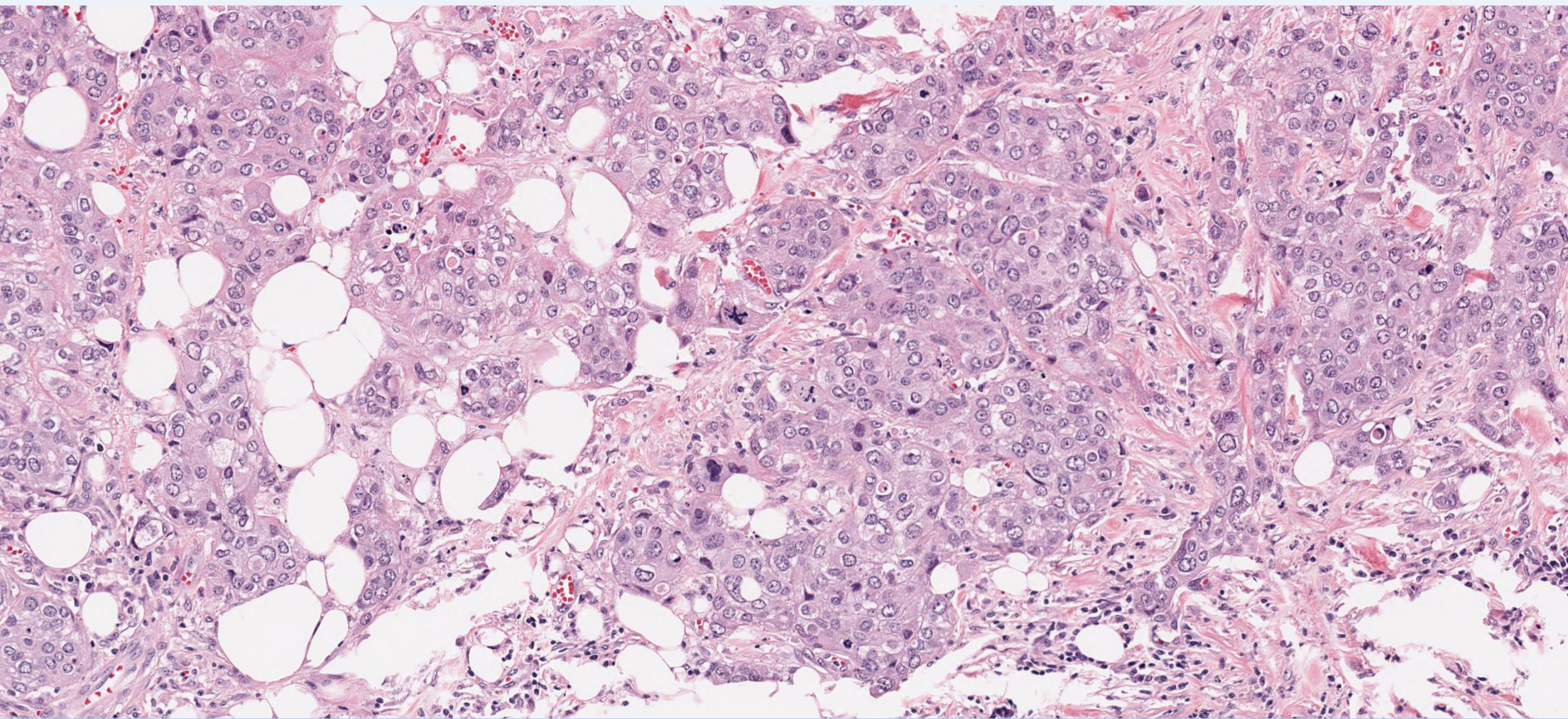
Low-grade adenosquamous carcinoma metaplastic carcinoma

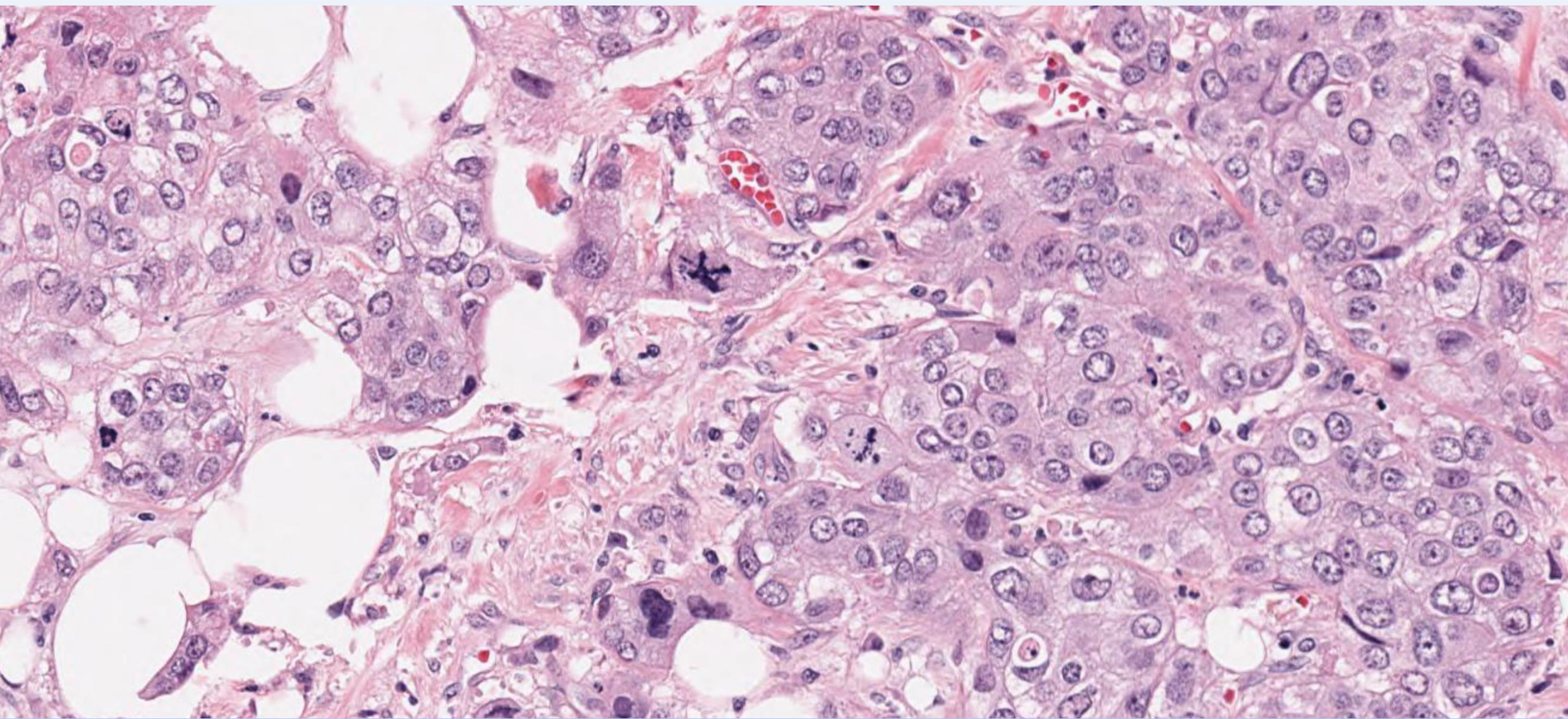
Low-grade fibromatosis-like metaplastic carcinoma

Nottingham Score/Grade









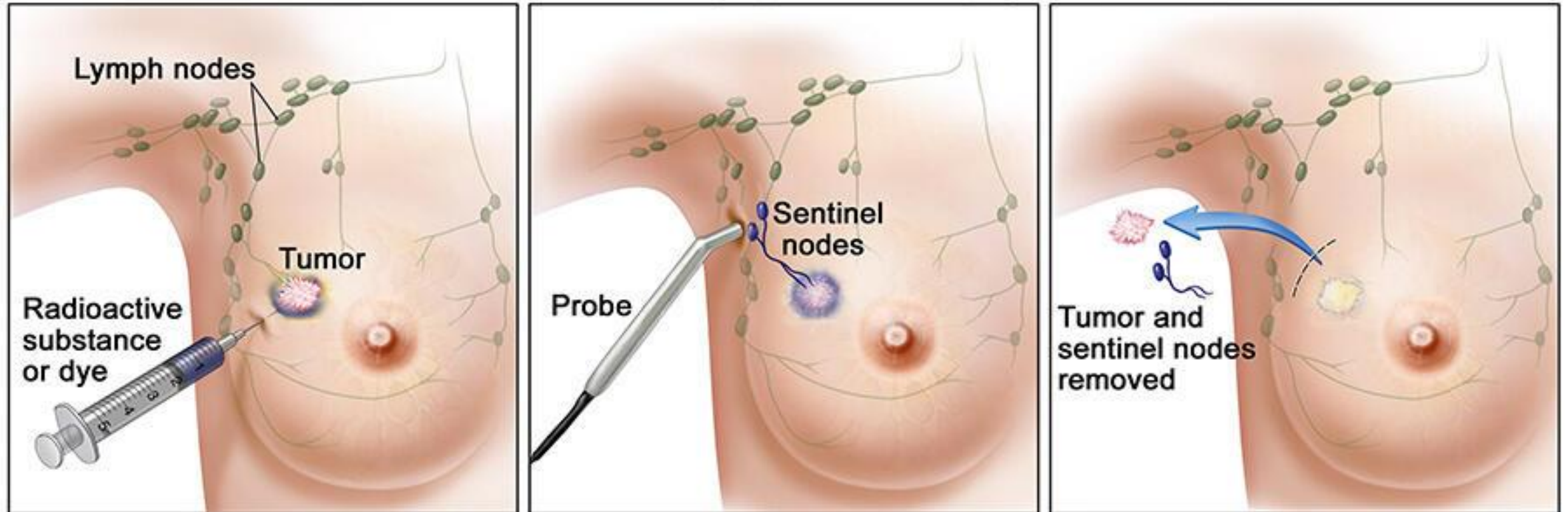
Size

Primary tumor (pT)

- **pTX**: cannot be assessed
- **pT0**: no evidence of primary tumor
- **pTis**: ductal carcinoma in situ, Paget disease, encapsulated papillary carcinoma and solid papillary carcinoma
 - **pTis (DCIS)**: ductal carcinoma in situ without invasive carcinoma
 - **pTis (Paget)**: Paget disease without invasive carcinoma
- **pT1mi**: tumor ≤ 1 mm
- **pT1a**: tumor > 1 mm but ≤ 5 mm
- **pT1b**: tumor > 5 mm but ≤ 10 mm
- **pT1c**: tumor > 10 mm but ≤ 20 mm
- **pT2**: tumor > 20 mm but ≤ 50 mm
- **pT3**: tumor > 50 mm
- **pT4a**: extension to chest wall (not including pectoralis muscle)
- **pT4b**: edema (including peau d'orange), ulceration of skin or ipsilateral satellite skin nodules
- **pT4c**: both T4a and T4b
- **pT4d**: inflammatory carcinoma (involves $> 1/3$ of the breast skin, primarily a clinical diagnosis)

Lymph Node Status

Sentinel Lymph Node Biopsy

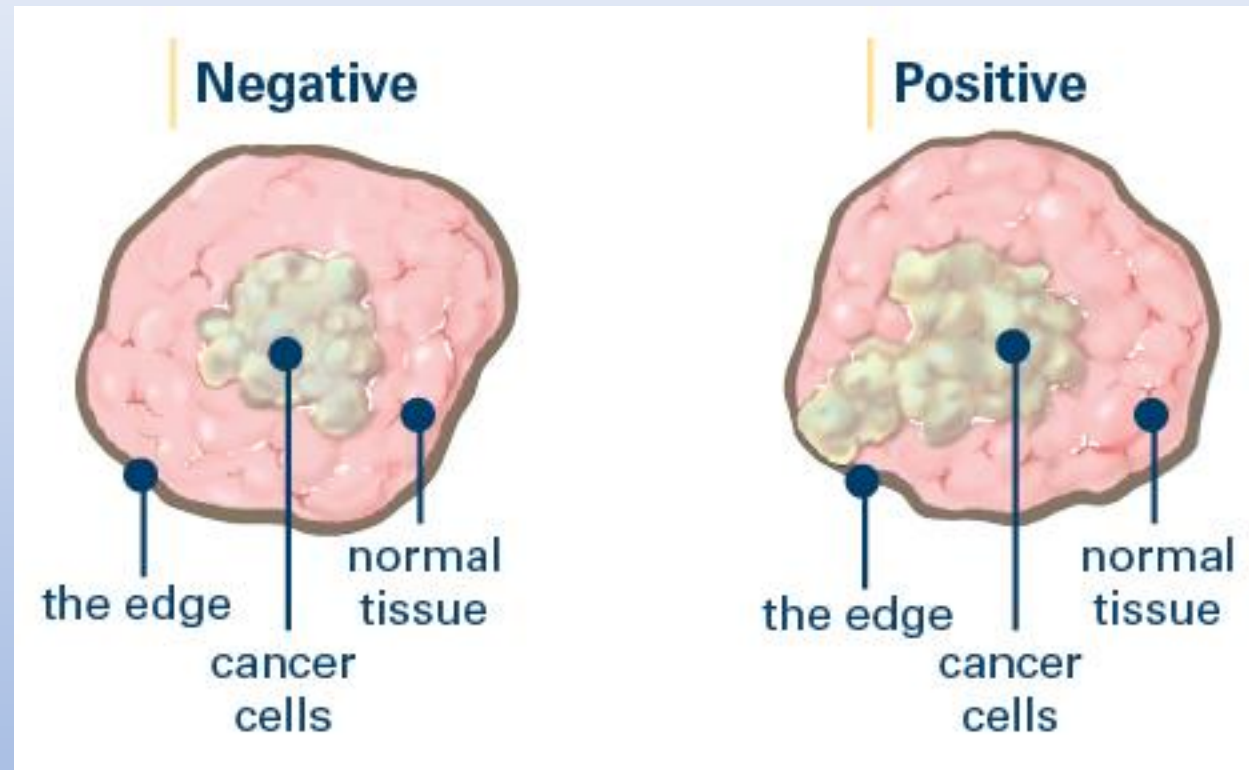


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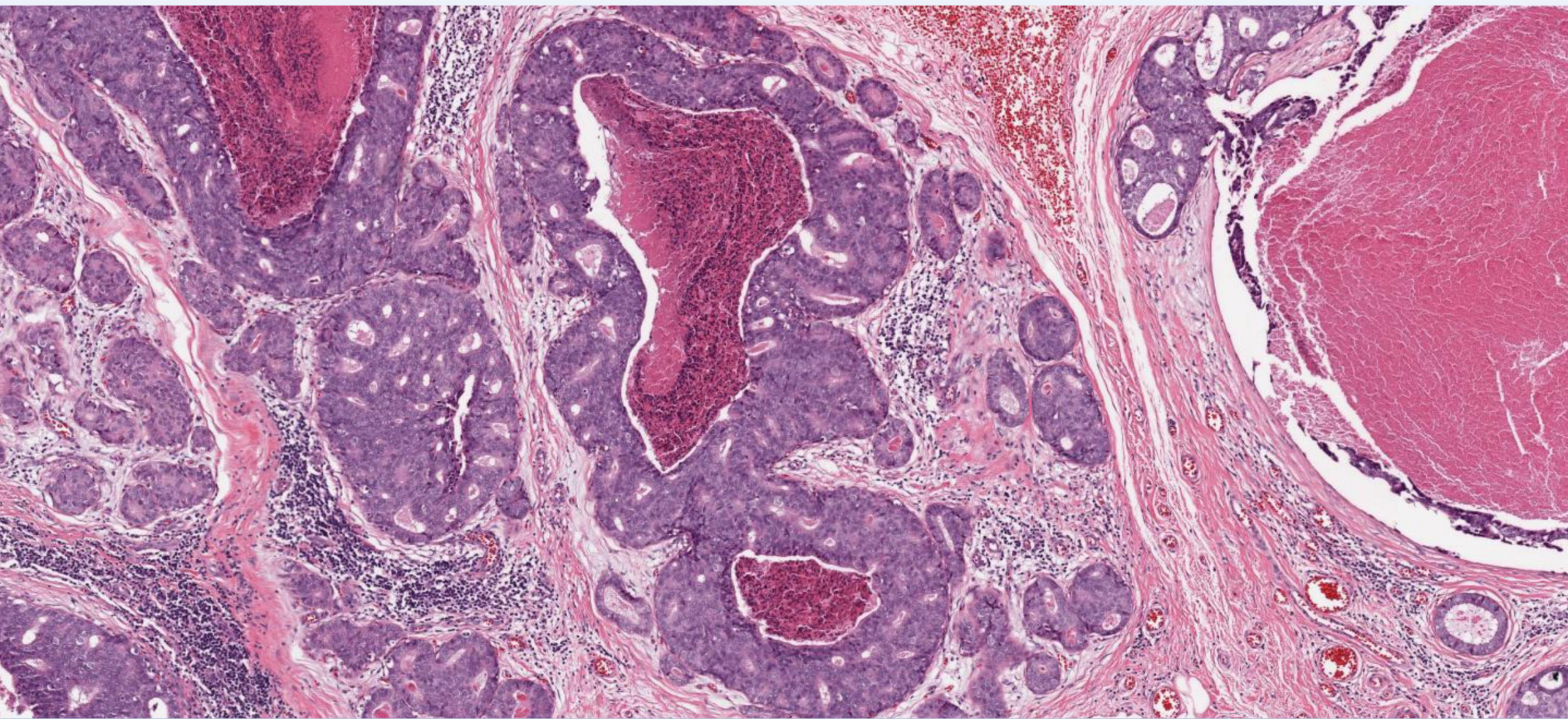
Regional lymph nodes (pN)

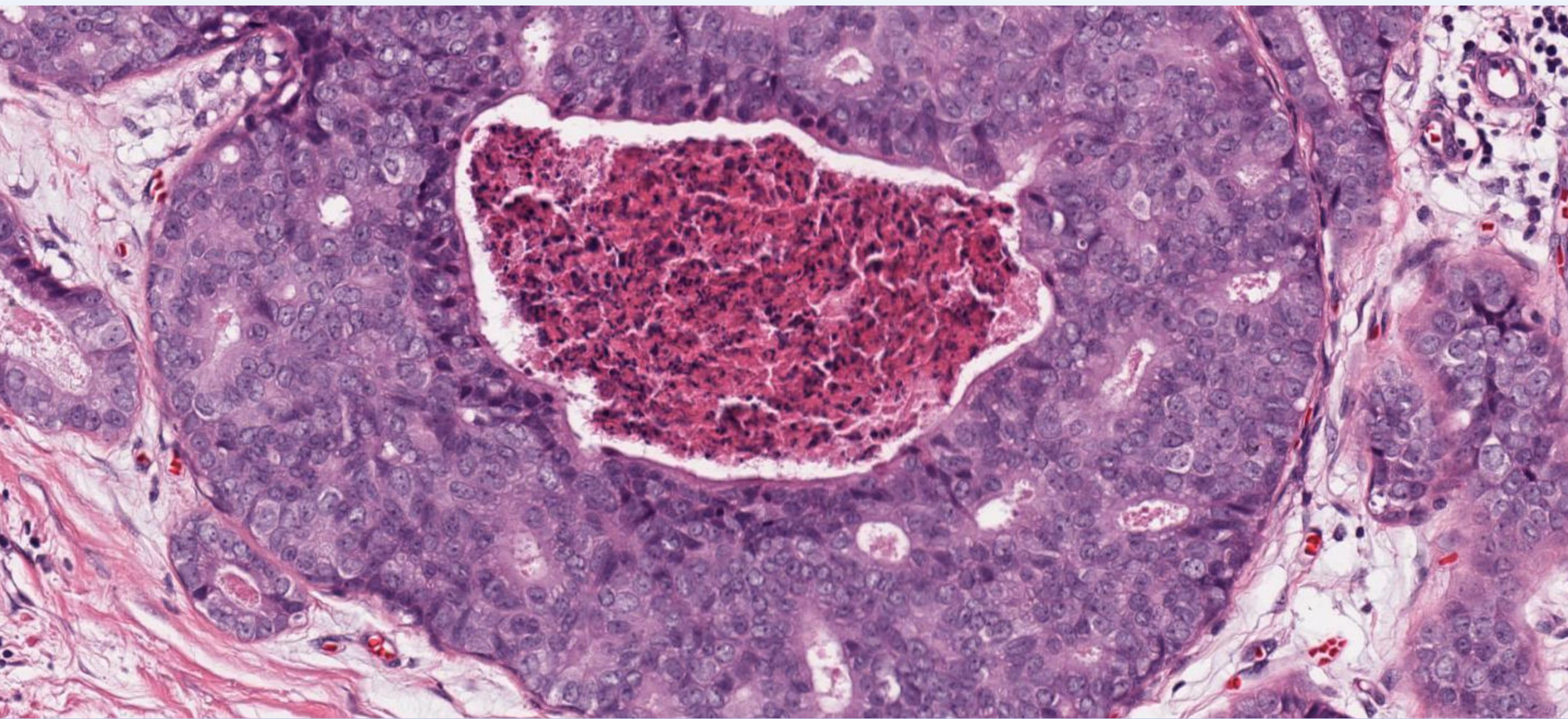
- **pNX**: cannot be assessed
- **pN0**: no regional lymph node metastasis histologically
- **pN0(i-)**: no regional lymph node metastasis by histology or immunohistochemistry
- **pN0(i+)**: isolated tumor cells (cluster ≤ 0.2 mm and < 200 cells)
- **pN0(mol+)**: RT-PCR positive but negative by light microscopy
- **pN1mi**: micrometastasis (tumor deposit > 0.2 mm and ≤ 2.0 mm or ≤ 0.2 mm and > 200 cells)
- **pN1a**: metastasis in 1 - 3 axillary lymph nodes with at least 1 tumor deposit > 2.0 mm
- **pN1b**: metastasis in internal mammary sentinel lymph node with tumor deposit > 2.0 mm
- **pN1c**: pN1a and pN1b
- **pN2a**: metastasis in 4 - 9 axillary lymph nodes with at least 1 tumor deposit > 2.0 mm
- **pN2b**: metastasis in clinically detected internal mammary nodes with pathologically negative axillary nodes
- **pN3a**: metastasis in ≥ 10 axillary lymph nodes with at least 1 tumor deposit > 2.0 mm or metastasis to infraclavicular lymph node
- **pN3b**: positive internal mammary node by imaging with pN1a or pN1b
- **pN3c**: metastasis in ipsilateral supraclavicular lymph node

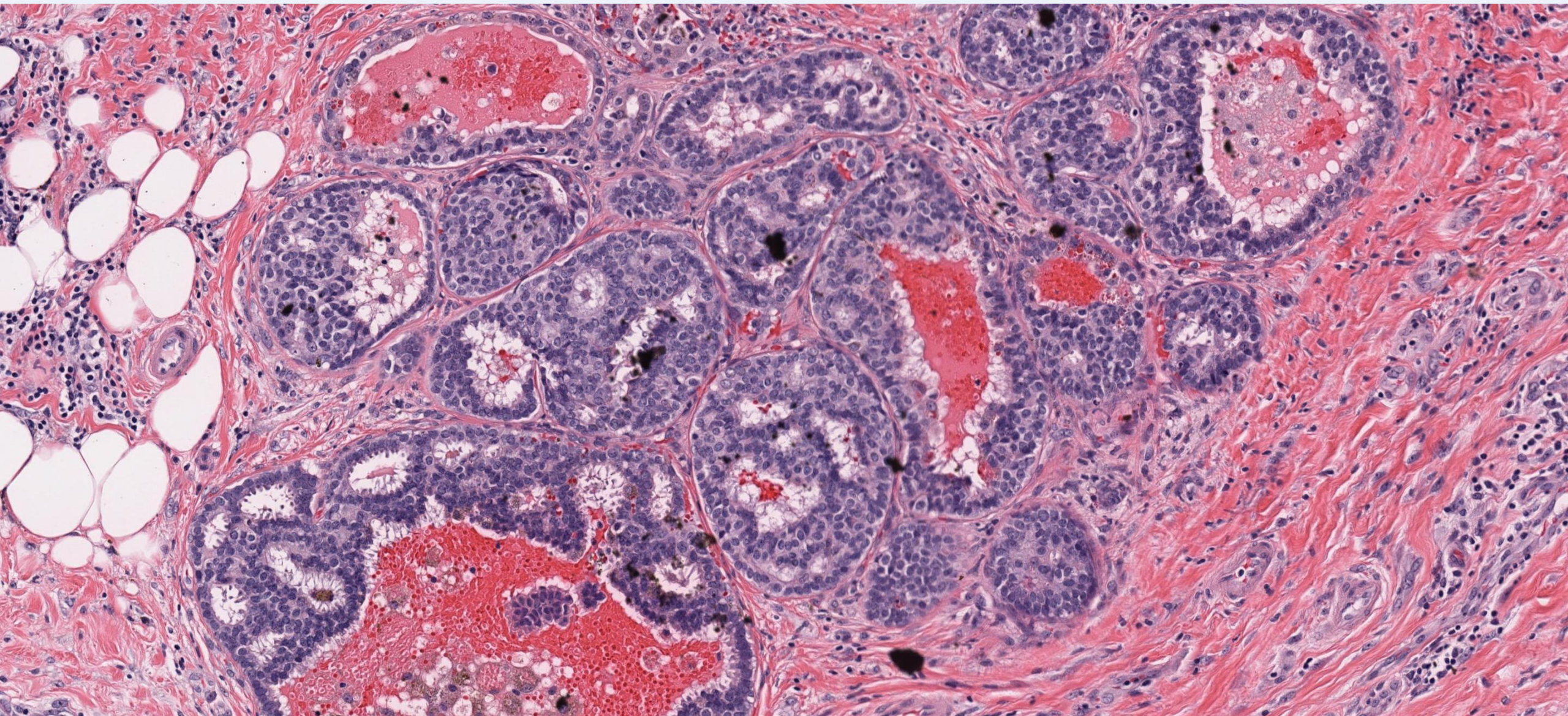
Margin Status

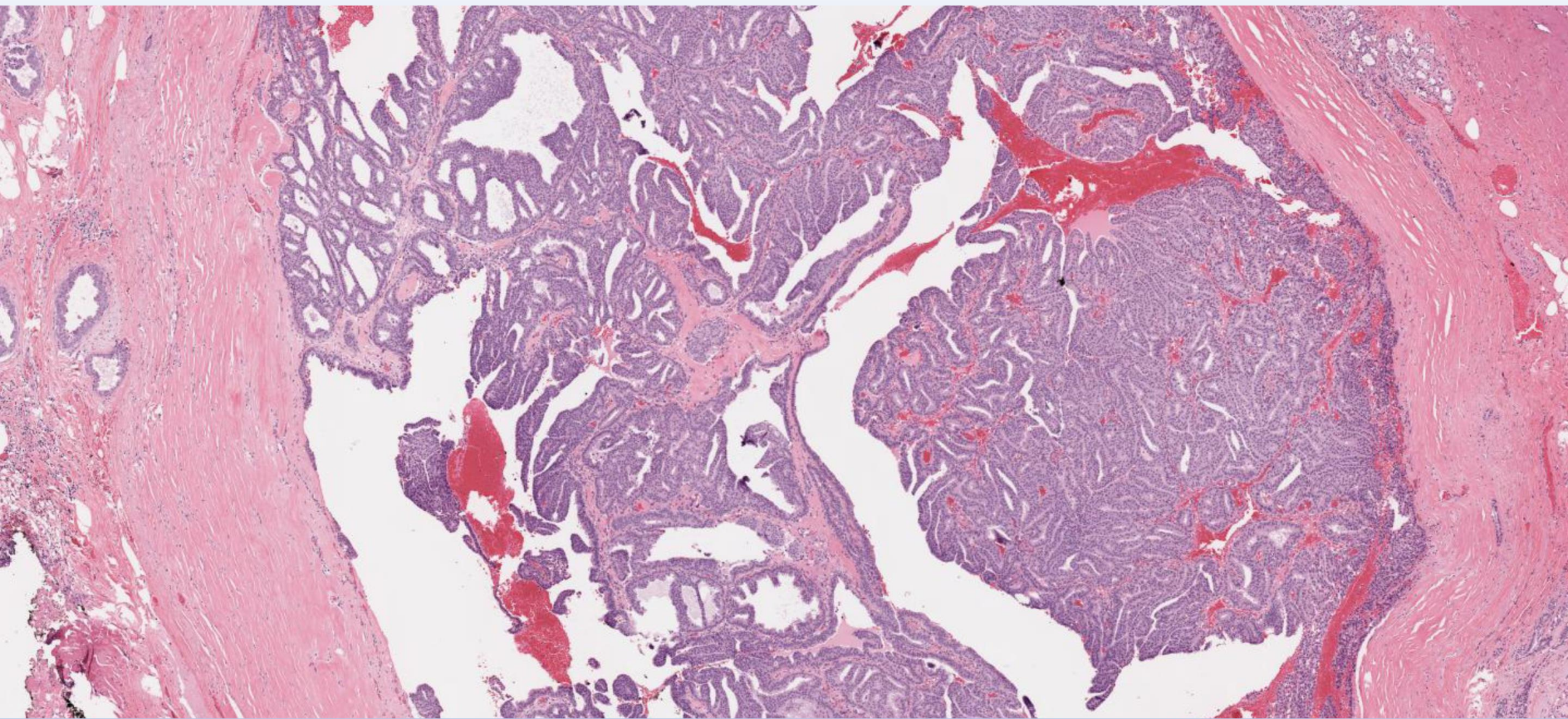


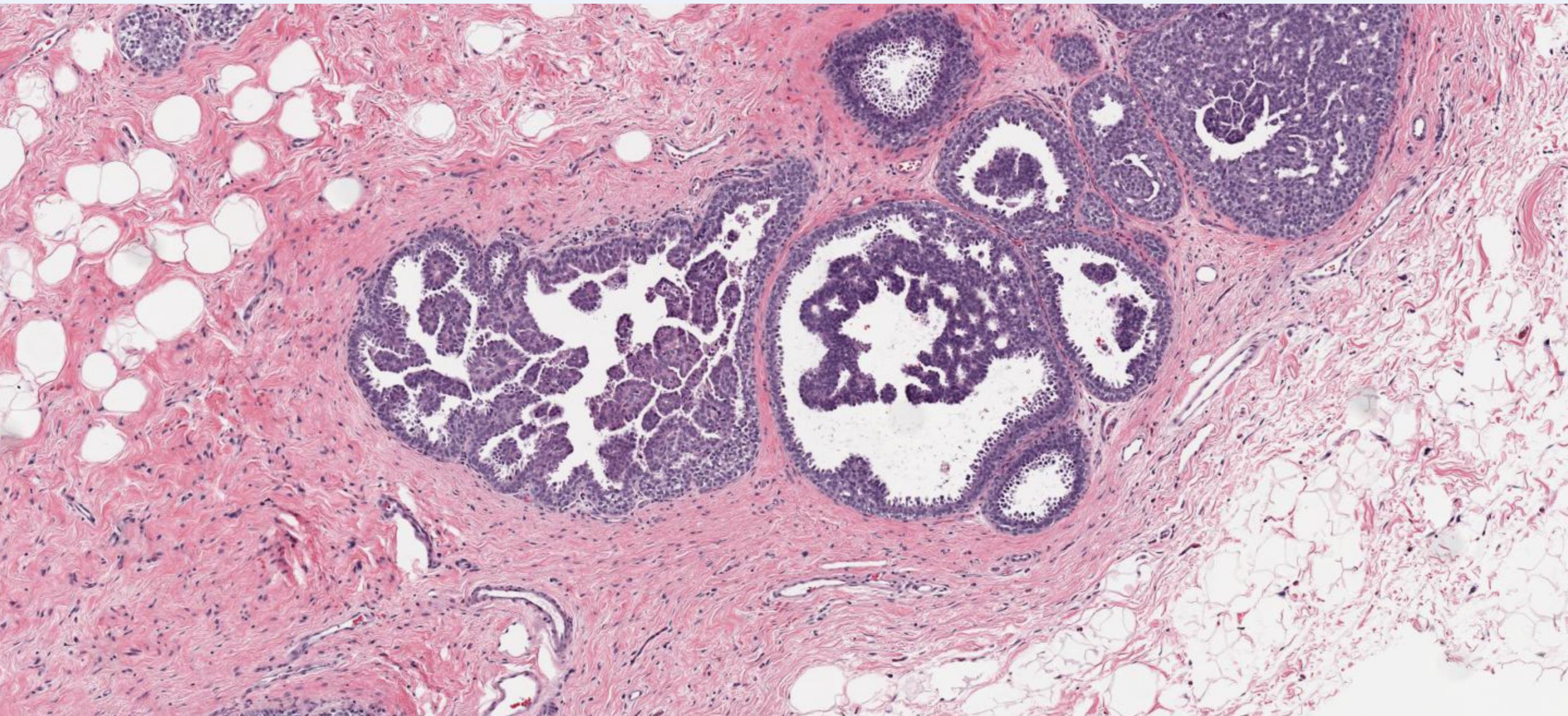
Associated DCIS

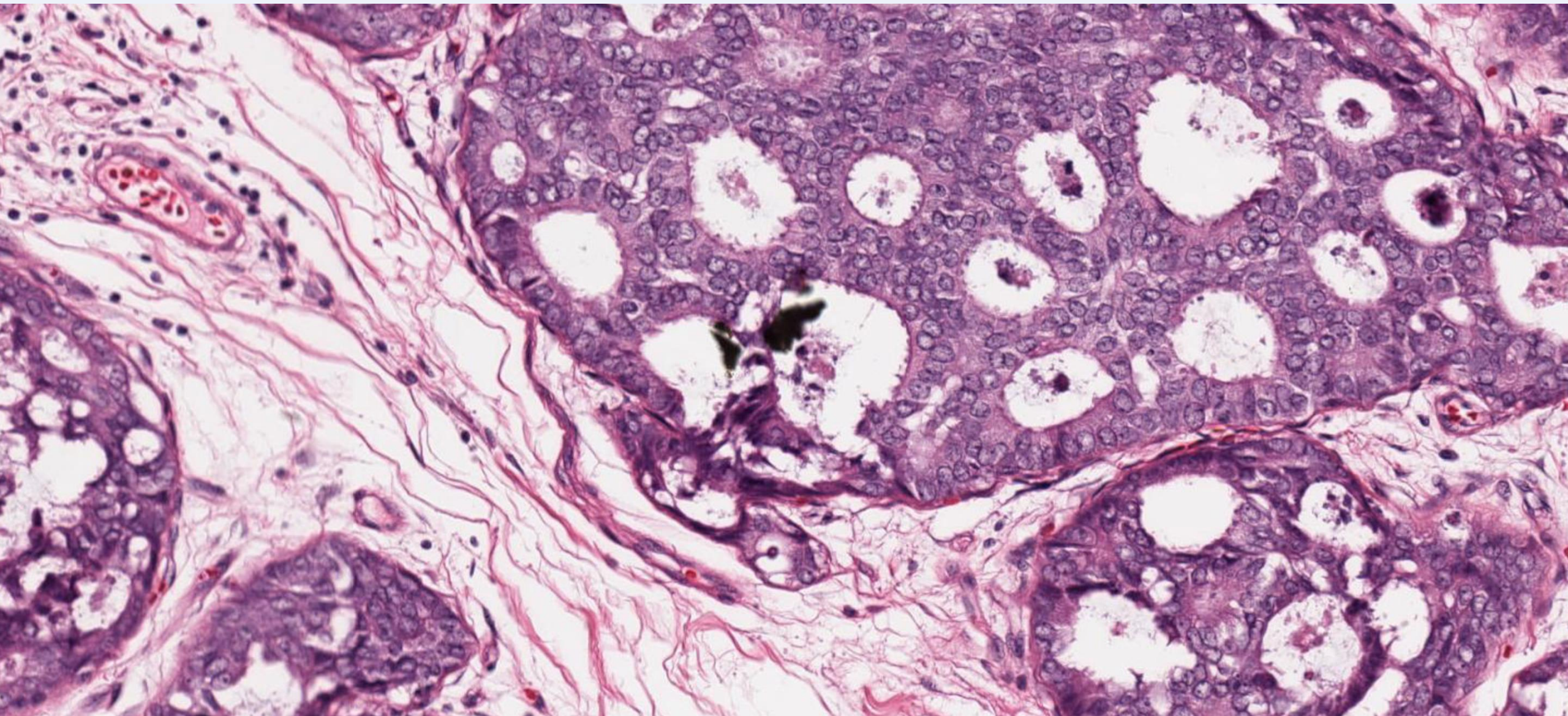




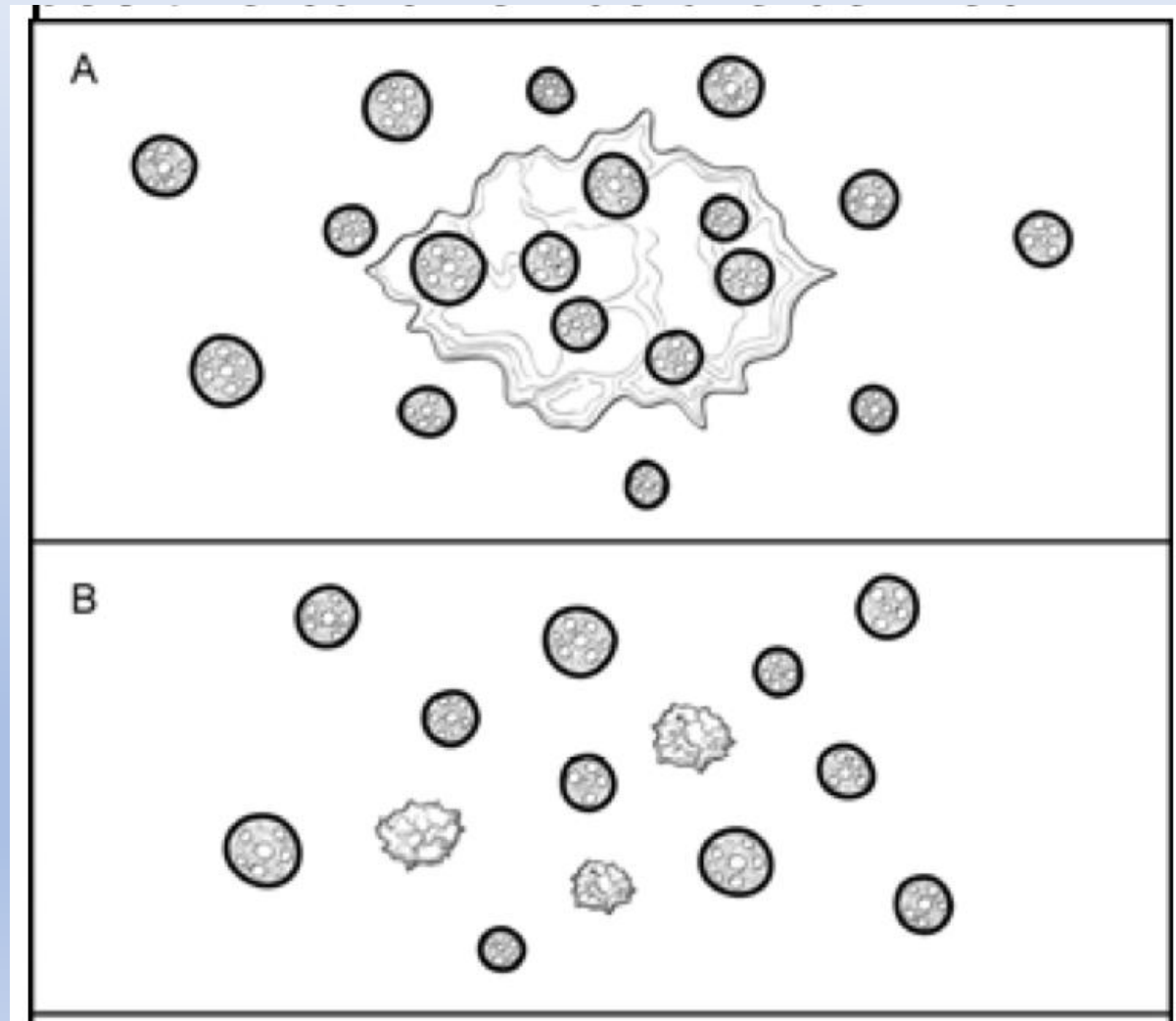




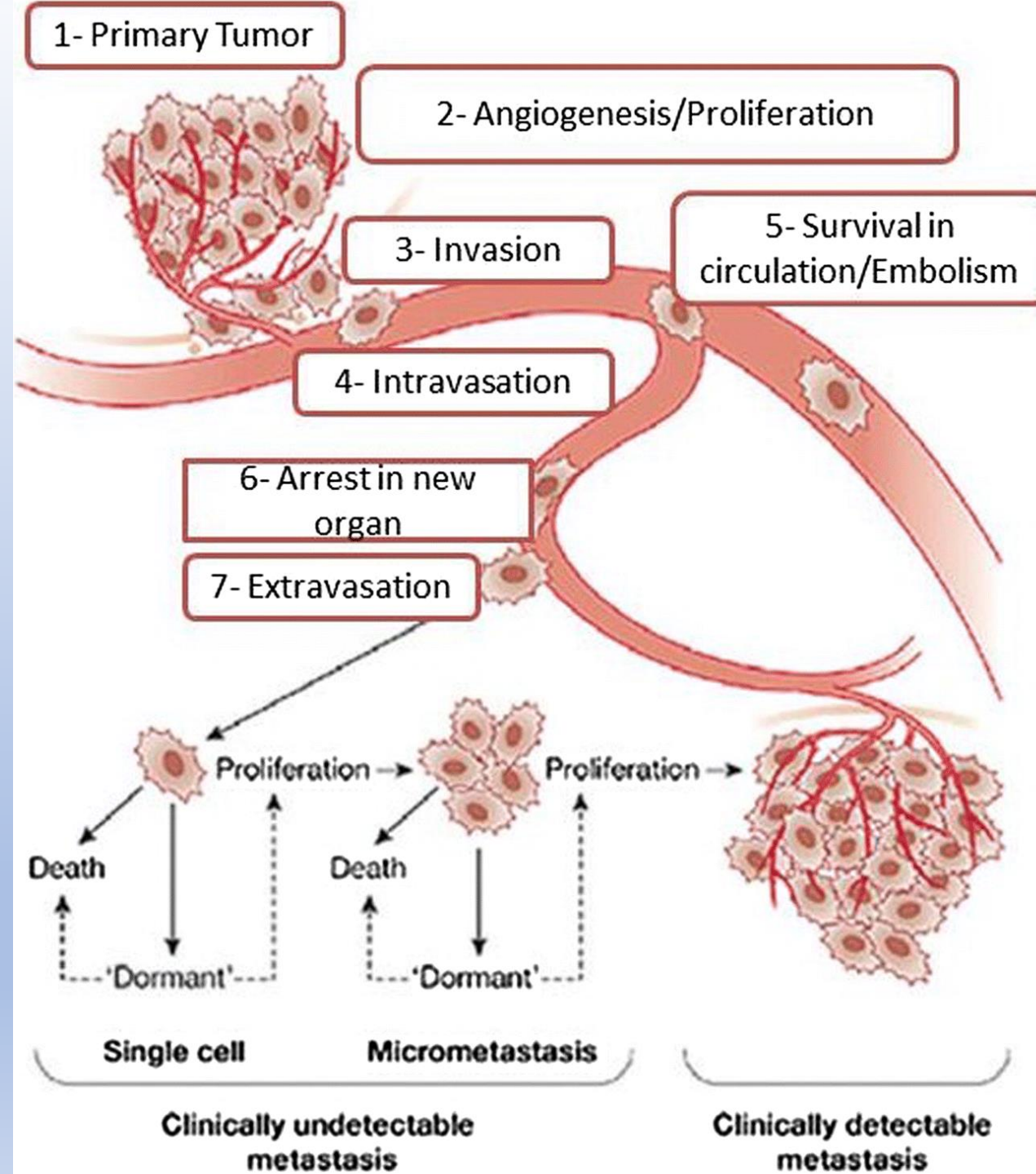




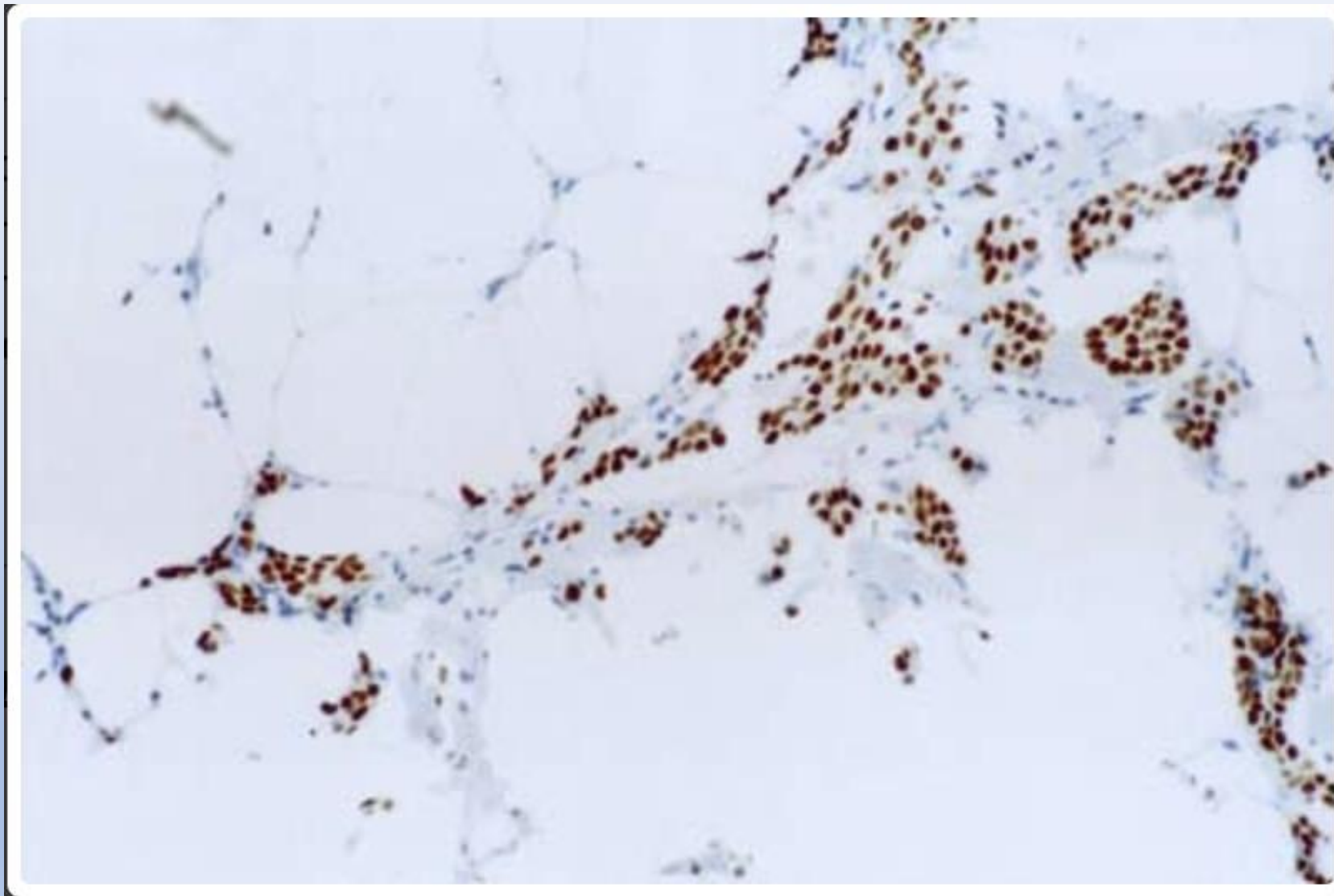
Extensive Intraductal Carcinoma (EIC)



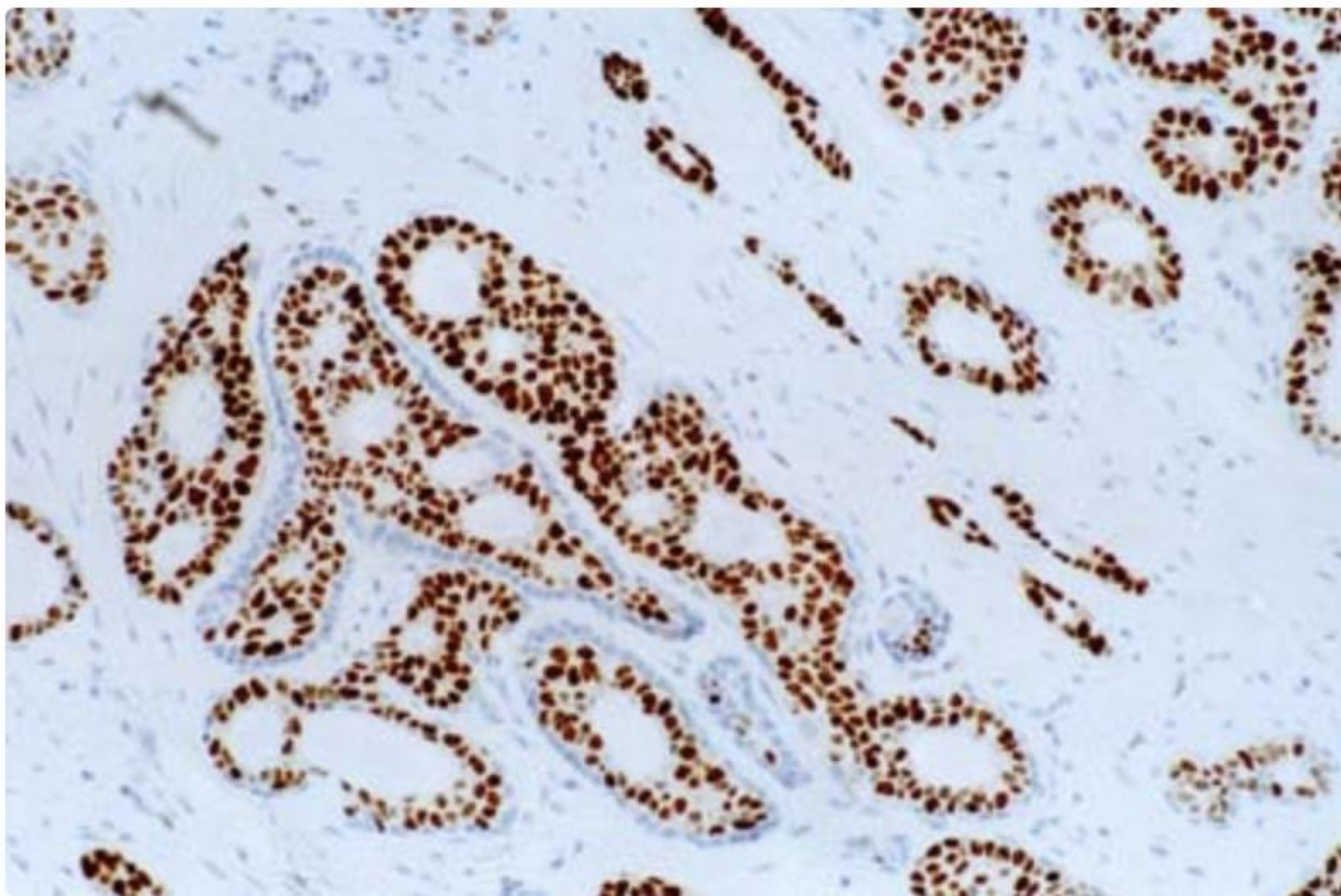
Lymphovascular Invasion (LVI)



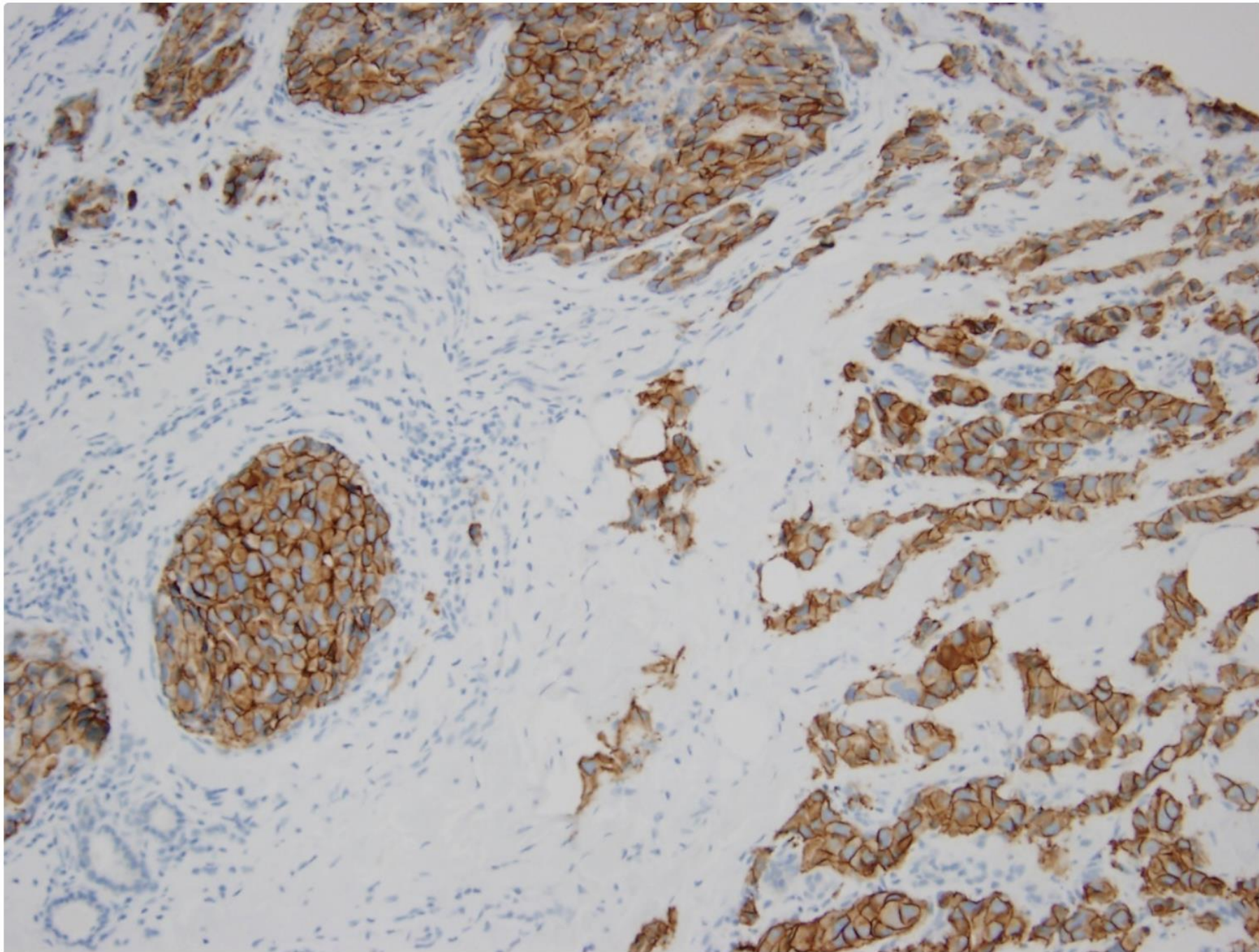
ER Expression



PR Expression

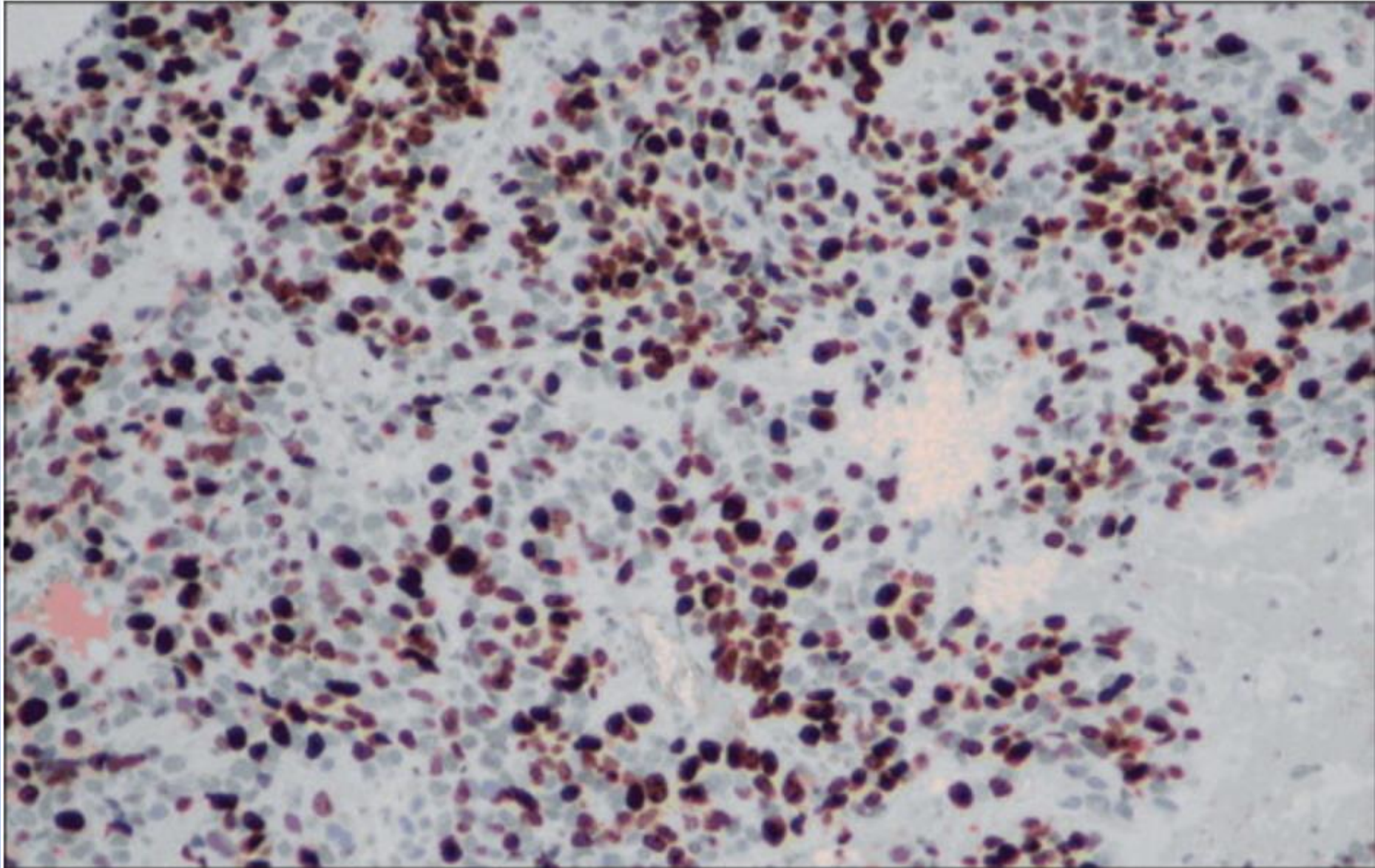


HER2 Status



HER2 3+

Proliferation Index (Ki67)



Gene Expression Panels

Oncotype DX Breast Recurrence Score® Report

Node Negative

oncotypeDX®
Breast Recurrence Score

DOE, JANE ELIZABETH

Date of Birth: 01-Jan-1950 Gender: Female Report Number: 597-01 Report Date: 05-Aug-2015

Specimen Source/ID: Breast/C83L0ZF1N

Ordering Physician: Dr. Harry D Smith

Recurrence Score®
(RS) Result

13

Decision on individual treatment especially around the RS 25 cutoff may consider other clinical factors.

Distant Recurrence Risk at 9 Years

With AI or TAM Alone

4%

95% CI (3%, 5%)

TAILORx

AI = Aromatase Inhibitor / TAM = Tamoxifen
CI = Confidence Intervals

Group Average Absolute Chemotherapy (CT) Benefit*

RS 11-25 All Ages

<1%

95% CI (-1%, 2%)

TAILORx

*For estimated CT benefit for individual RS results, see page 2.

Exploratory Subgroup Analysis for TAILORx and NSABP B-20:
Absolute CT Benefit for Distant Recurrence by Age and RS Result

Age	RS 0-10	RS 11-15	RS 16-20	RS 21-25	RS 26-100
>50 years		No CT Benefit (<1%)			>15% CT Benefit
≤50 years	No CT Benefit (<1%)	~1.6% CT Benefit	~6.5% CT Benefit	>15% CT Benefit	

Quantitative Single-Gene Scores¹



1. ER Score based on quantitative ESR1 expression (estrogen receptor); PR Score based on quantitative PGR expression (progesterone receptor); HER2 Score based on quantitative ERBB2 expression.

Oncotype DX Breast Recurrence Score® Report

Node Negative

oncotype DX
Breast Recurrence Score

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Date of Birth: 01-Jan-1950

Gender: Female

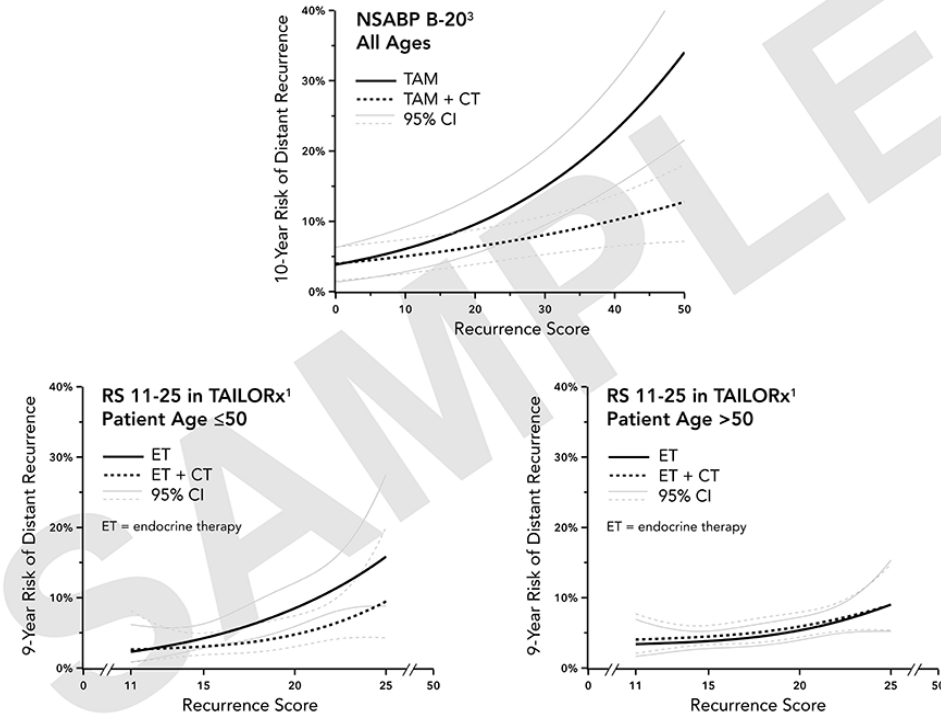
Report Number: 597-01

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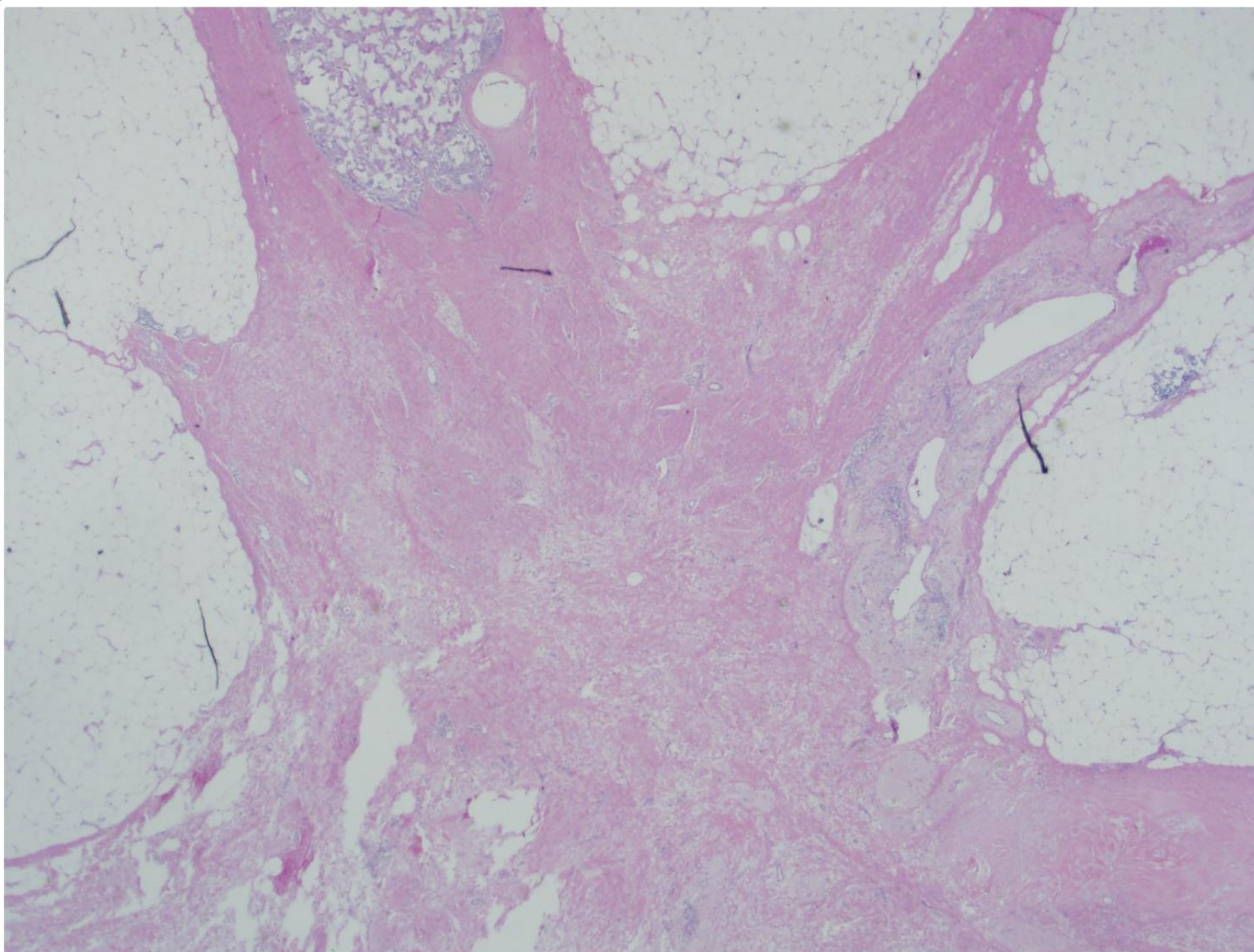
Ordering Physician: Dr. Harry D Smith

Estimated Chemotherapy Benefit for Individual Recurrence Score Results

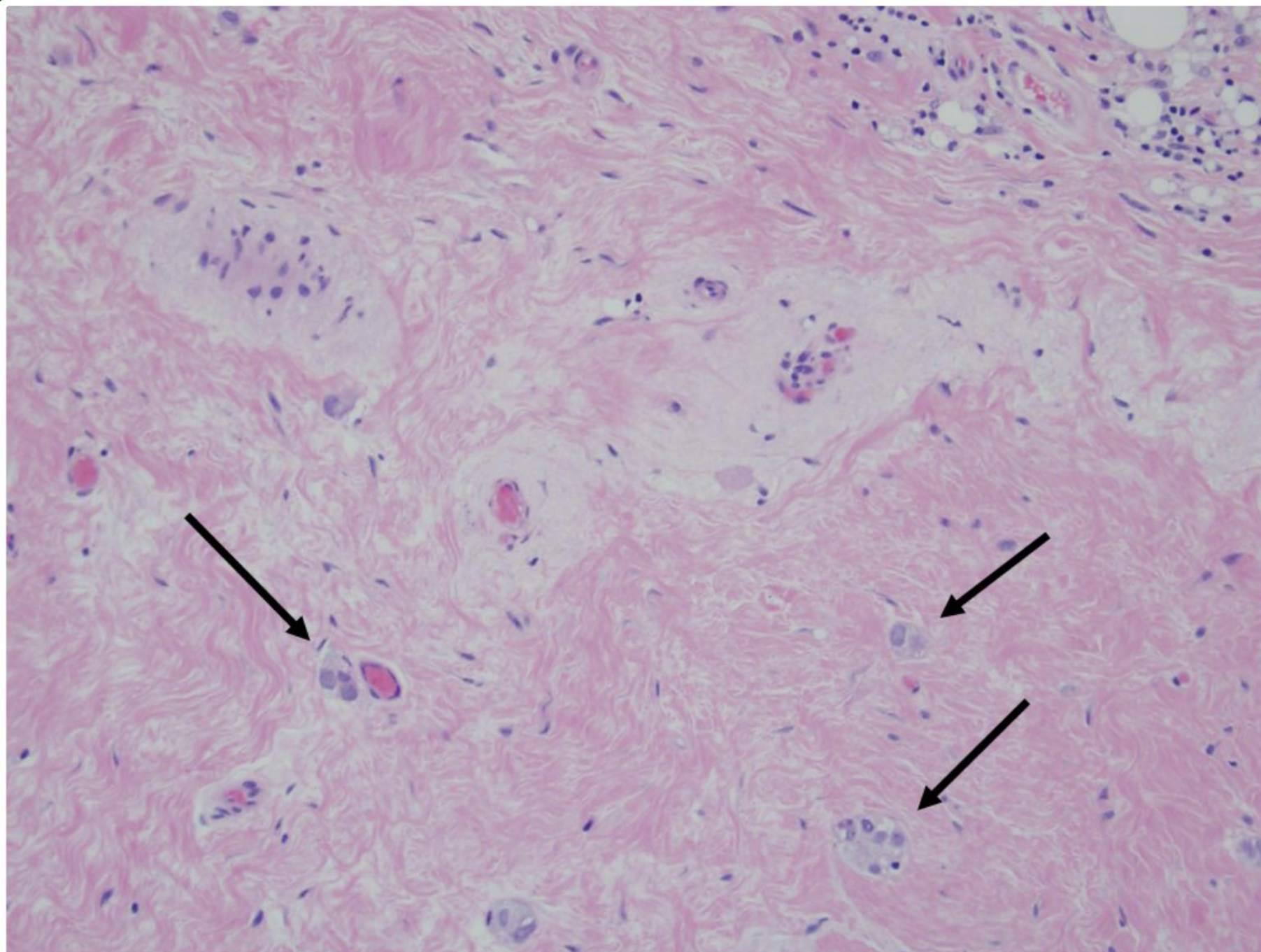


Recurrence Score ranges shown above reflect randomized patients in NSABP B-20 and TAILORx.

Neoadjuvant Response

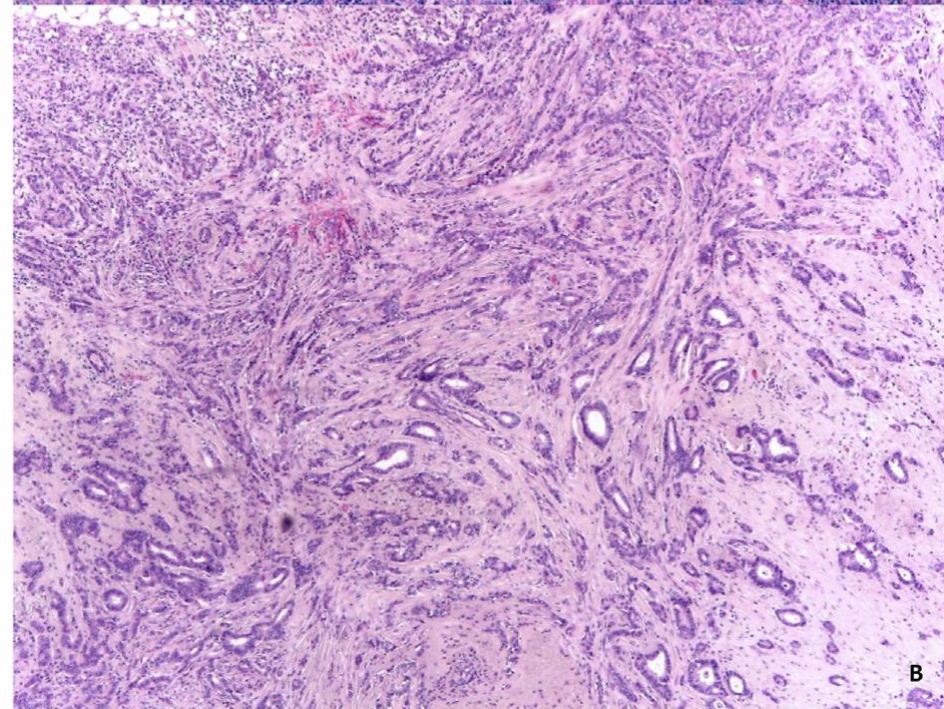
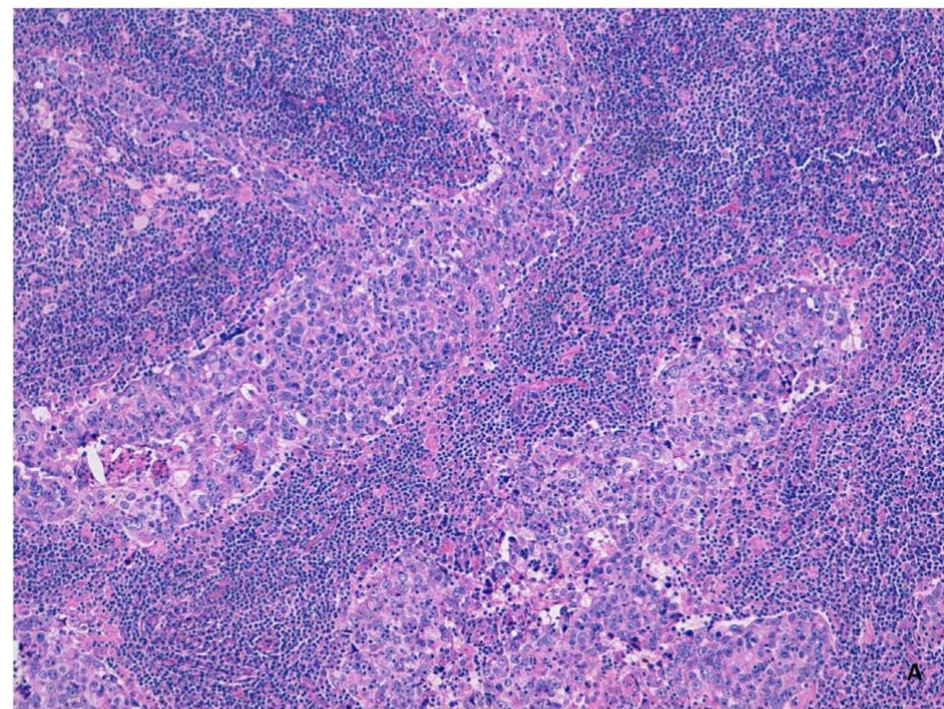


Fibrous tumor bed with no residual invasive or in situ tumor. Biopsy site seen at the top of the photo



Tumor bed with small clusters of residual invasive tumor cells (arrows)

Tumor Infiltrating Lymphocytes

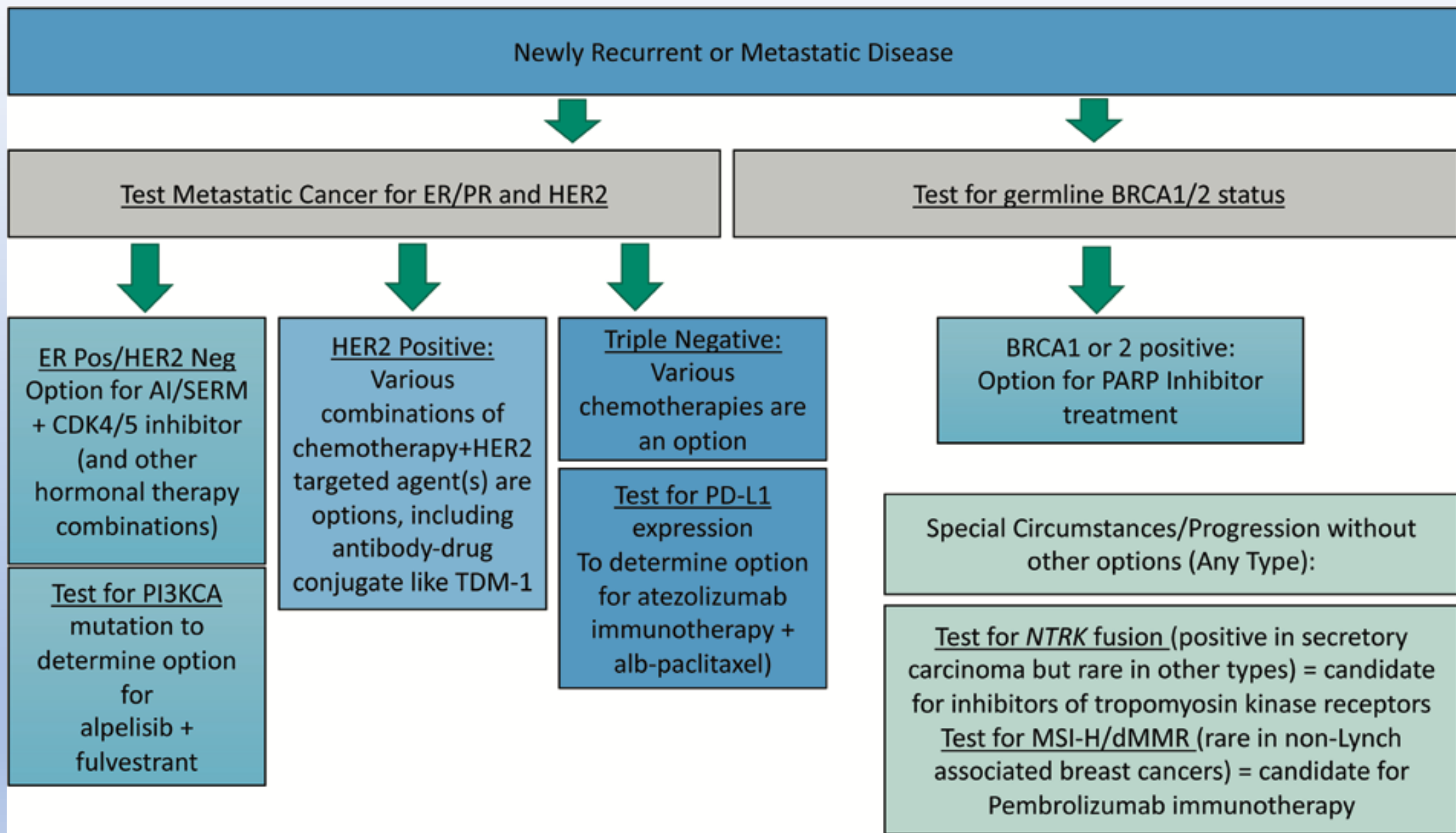


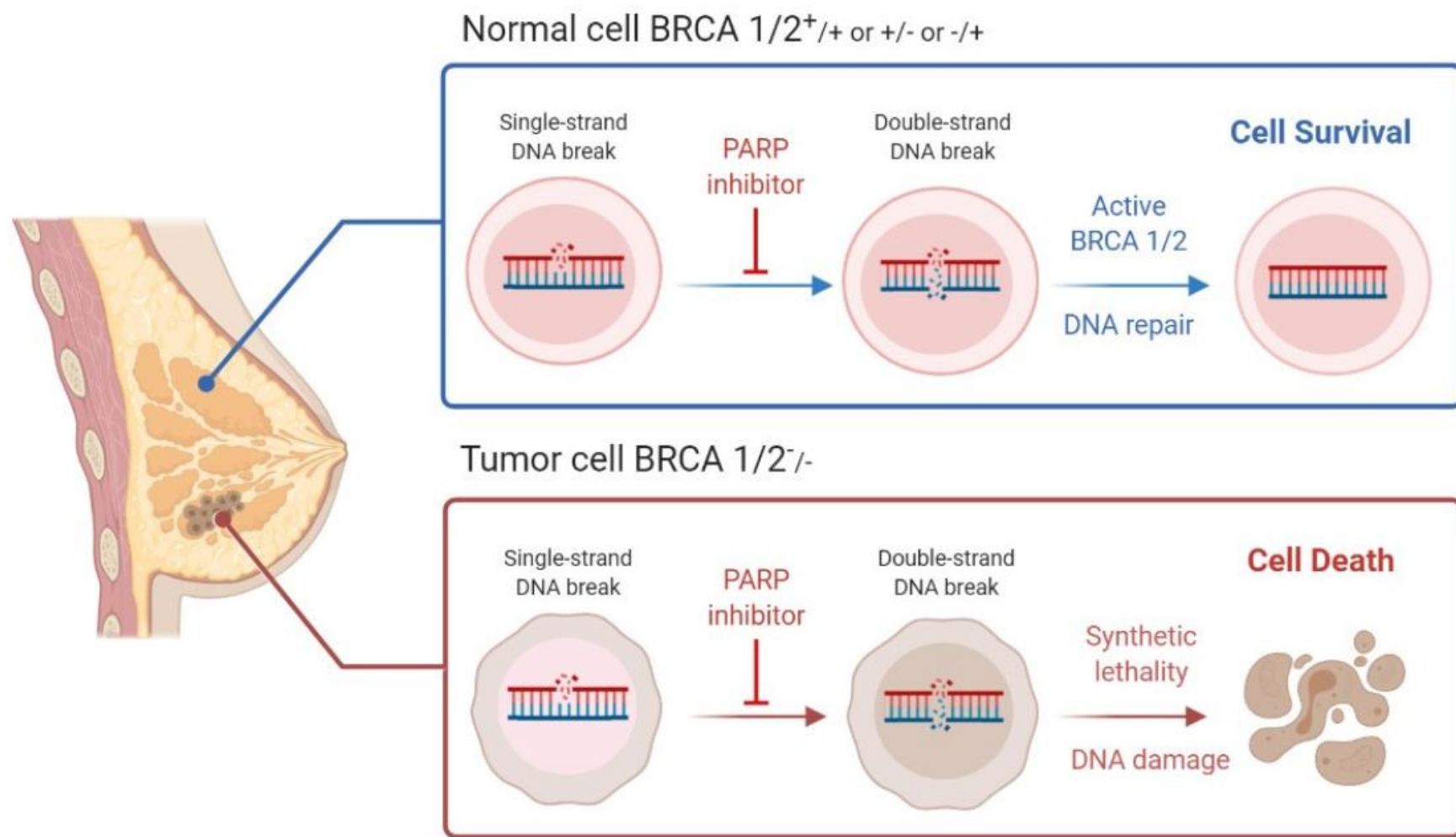
Newly Recurrent or Metastatic Disease

Distant metastasis (M)

- **pM1**: distant metastasis histologically proven > 0.2 mm

ANATOMIC STAGE/PROGNOSTIC GROUPS			
Stage 0	Tis	N0	M0
Stage IA	T1*	N0	M0
Stage IB	T0	N1mi	M0
	T1*	N1mi	M0
Stage IIA	T0	N1**	M0
	T1*	N1**	M0
	T2	N0	M0
Stage IIB	T2	N1	M0
	T3	N0	M0
Stage IIIA	T0	N2	M0
	T1*	N2	M0
	T2	N2	M0
	T3	N1	M0
	T3	N2	M0
Stage IIIB	T4	N0	M0
	T4	N1	M0
	T4	N2	M0
Stage IIIC	Any T	N3	M0
Stage IV	Any T	Any N	M1





PARP inhibitors: Treatment for BRCA mutant Breast Cancer

COVID

Meeting Abstract | 2021 ASCO Annual Meeting I

BREAST CANCER—LOCAL/REGIONAL/ADJUVANT

The impact of COVID-19 on breast cancer stage at diagnosis.



[Maxwell Roger Lloyd](#), [Sarah Jo Stephens](#), [Julian C. Hong](#), [Ted A. James](#), [Tejas Mehta](#), [Abram Recht](#), ...

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Abstract

diagnosis. **Conclusions:** Patients were more likely to be diagnosed with late-stage breast cancer following the global shutdown due to the SARS-CoV-2 pandemic. Patients with lower income and medical comorbidities were disproportionately affected. These data raise significant concerns regarding the impact of SARS-CoV-2 on cancer diagnoses and long-term outcomes, especially in vulnerable patient populations.

Proportion of patients with late disease by month of diagnosis.

Month	2016-2019	2020	Month	2016-2019	2020
Jan	7% (9/130)	0 (0/24)	Jul	9% (12/142)	7% (1/14)
Feb	5% (6/125)	10% (2/20)	Aug	9% (13/140)	21% (9/42)
Mar	7% (9/132)	3% (1/31)	Sep	5% (6/124)	15% (10/65)
Apr	6% (7/118)	0 (0/9)	Oct	7% (10/135)	19% (10/53)
May	7% (10/141)	0 (0/7)	Nov	7% (10/145)	12% (5/42)
Jun	7% (10/147)	21% (3/14)	Dec	3% (4/118)	8% (1/12)

Acknowledgement

- Path Presenter (pathpresenter.net)
- Pathologyoutlines.com

Thank you!

Questions?