



Making Sense of AJCC 8th edition Prognostic Staging in  
Breast Cancer

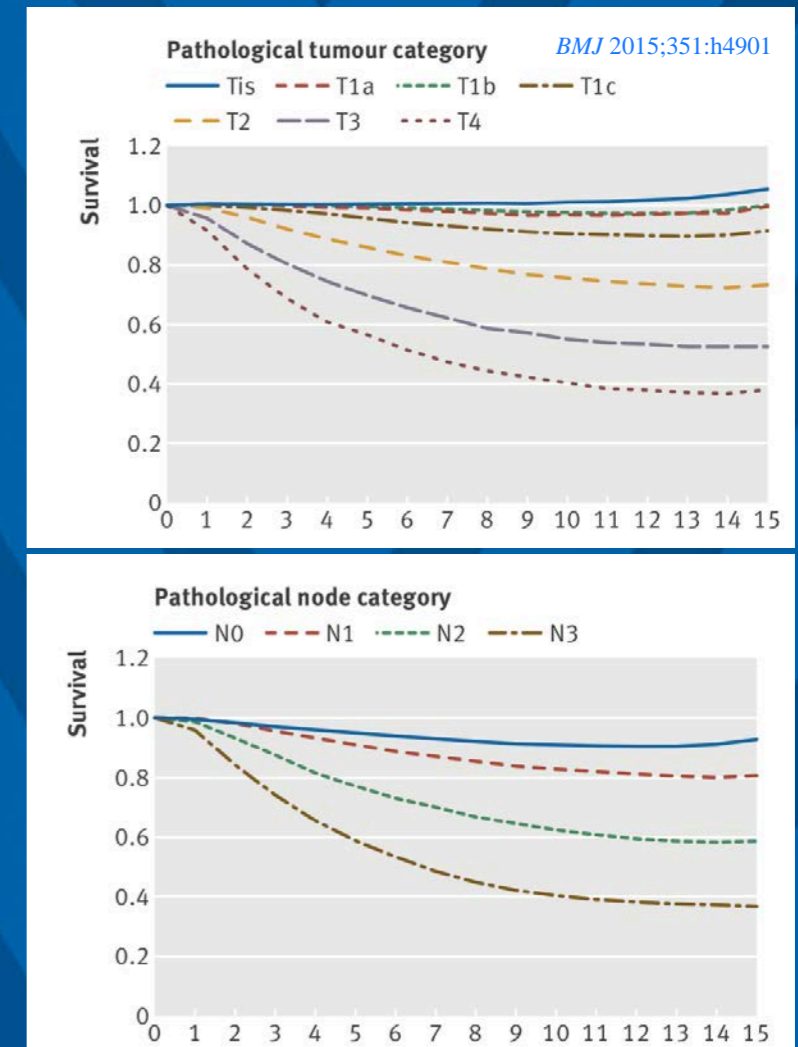
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# Objectives

- Define role of breast cancer staging in oncology practice
- Short coming of 7th edition or previous staging
- What is new is 8th edition?

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Common knowledge that breast cancer is stage (TNM) from 0 to IV
- Each stage carries significant information
  - primary tumor burden (T)
  - lymph node involvement (N)
  - spread beyond loco-regionally (M)
  - TNM together give us long term outcome information
    - PFS (progression free survival)
    - OS (overall survival)
- Above information is used to make clinical decision
  - primary surgical resection VS neoadjuvant chemotherapy vs omitting chemotherapy vs addition of radiation therapy etc.



# AJCC 8th edition Prognostic Staging in Breast Cancer

- Short coming of previous staging systems
  - IHC receptor status
    - Hormone positive breast cancer
    - Her-2 positive and hormone positive breast cancer
    - Her-2 positive breast cancer
    - Triple negative breast cancer
  - Histological grade
    - Grade 1
    - Grade 2
    - Grade 3
- Gene expression profiles (Oncotype DX RS, etc)
- Cellular proliferation index (Ki 67)

Invasive Cancer Histologic Grade (Scarff-Bloom-Richardson [SBR] Grading System, Nottingham Modification)	
<b>GX</b>	Grade cannot be assessed
<b>G1</b>	Low combined histologic grade (favorable); SBR score of 3-5 points
<b>G2</b>	Intermediate combined histologic grade (moderately favorable); SBR score of 6-7 points
<b>G3</b>	High combined histologic grade (unfavorable); SBR score of 8-9 points

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Hormone receptor positive breast cancer
  - Estrogen receptor and progesterone positive breast cancer
- Estrogen receptor positive alone
  - prognosis not similar ER and PR positive
- Progesterone positive alone
  - prognosis worse than ER, ER and PR positive
- Ki 67, a cellular proliferation marker can help, but that isn't accounted for in earlier staging systems

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Her-2 positive breast cancer
  - Her-2 positive alone
  - Her-2 positive and hormone positive
- Previous staging systems fail to differentiate between above mentioned subtypes
- Significant prognostic and therapeutic difference

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Triple negative breast cancer
  - poor prognostic subtypes
    - higher recurrence rates
    - higher metastatic rates
    - lower PFS and OS
- earlier staging system didn't take TNBC character in to account
  - ie treated tumor of 1 cm that is hormone +ve similarly to TNBC tumor

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Histological grade
  - higher grade is a poor prognostic maker
  - 7th edition didn't incorporate impact of histological grade
- Gene expression profiles
  - prognosticate about recurrences
  - assist with treatment decision
  - 7th edition didn't incorporate GEP into staging system



# AJCC 8th edition Prognostic Staging in Breast Cancer

- What is new in 8th edition
  - attempts to overcome 7th edition shortcoming
    - incorporates tumor biology
      - Hormone positive
        - GEP can determine stage for T1 T2 tumor
      - Her-2 positive
        - relative stage higher than HR positive alone
      - TNBC
        - relative stage higher than HR positive alone
      - Histological grade can upstage

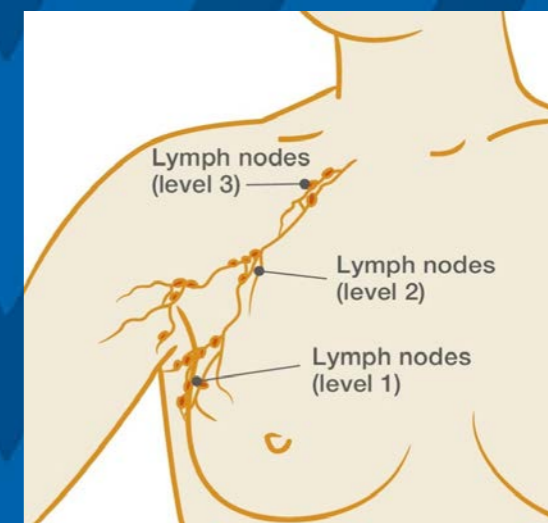
# AJCC 8th edition Prognostic Staging in Breast Cancer

- Tumor size (T)
  - T0 – No evidence of primary tumor
  - Tis – Carcinoma in situ (**LCIS no longer consider under this**)
    - **Tis (DCIS)** – Ductal carcinoma in situ
    - **Tis (Paget)** – Paget disease (no invasive disease)
  - T1 – Tumor  $\leq 20$  mm in greatest dimension
    - **T1mi** – Tumor  $\leq 1$  mm in greatest dimension
    - **T1a** – Tumor  $> 1$  mm but  $\leq 5$  mm in greatest dimension (**round any measurement 1.0 to 1.9 mm to 2 mm**)
    - **T1b** – Tumor  $> 5$  mm but  $\leq 10$  mm in greatest dimension
    - **T1c** – Tumor  $> 10$  mm but  $\leq 20$  mm in greatest dimension
  - T2 – Tumor  $> 20$  mm but  $\leq 50$  mm in greatest dimension
  - T3 – Tumor  $> 50$  mm in greatest dimension
  - T4 – Tumor of any size with direct extension to the chest wall and/or the skin (ulceration or macroscopic skin nodules)
    - **T4a** – Extension to chest wall, not including only pectoralis muscle adherence/invasion.
    - **T4b** – Ulceration and/or ipsilateral satellite nodules and/or edema (including peau d'orange) of the skin, which do not meet the criteria for inflammatory carcinoma.
    - **T4c** – Both (T4a and T4b).
    - **T4d** – Inflammatory carcinoma

Adapted from AJCC and NCCN

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Node status (N)
  - cNX – Regional lymph nodes cannot be assessed (previous surgery)
  - cN0 – No regional lymph node metastases (neither by imaging nor clinical exam)
  - cN1 – Metastasis to movable ipsilateral level I, II axillary lymph nodes(s)
    - cN1mi – Micrometastases (approximately 200 cells, larger than 0.2 mm, but none larger than 2.0 mm)
      - used rarely (SLN Bx prior to start of NAC)
  - cN2 – Metastasis to ipsilateral level I, II axillary lymph nodes that are clinically fixed or matted; or in ipsilateral internal mammary nodes in the absence of clinically evident axillary node metastases
    - **N2a** – Metastasis to ipsilateral level I, II axillary lymph nodes fixed to one another (matted) or to other structures.
    - **cN2b** – Metastasis only in ipsilateral internal mammary nodes, and in the absence of clinically evident axillary node metastases
  - cN3 – Metastases in ipsilateral infraclavicular (level III axillary) lymph node(s) with or without level I, II axillary lymph node involvement; or in ipsilateral internal mammary lymph node(s) with clinically evident level I, II axillary lymph node metastases; or metastases in ipsilateral supraclavicular lymph node(s) with or without axillary or internal mammary lymph node involvement
    - **cN3a** – Metastasis to ipsilateral infraclavicular lymph node(s)
    - **cN3b** – Metastasis to ipsilateral internal mammary lymph node(s) and axillary lymph nodes
    - **cN3c** – Metastasis in ipsilateral supraclavicular lymph node(s)



Adapted from AJCC and NCCN

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Distal diseases (M)
  - M0: No clinical or radiographic evidence of distant metastases
    - no pathologic M0 category
  - cM0(i+) No clinical or radiographic evidence of distant metastases
    - deposits of molecularly or microscopically detected tumor cells that are no larger than 0.2 mm are present in circulating blood, bone marrow, or other non-regional nodal tissue
  - M1 – Distant detectable metastases

Adapted from AJCC and NCCN

# AJCC 8th edition Prognostic Staging in Breast Cancer

- TNM Grouping

TNM	Grade	HER2	ER	PR	Stage			
Tis N0 M0	Any	Any	Any	Any	0			
T1* N0 M0 T0 N1mi M0 T1* N1mi M0	G1	Positive	Positive	Positive	IA			
				Negative		Negative		
		Negative	Positive	Positive		IB		
				Negative			Negative	
		G2	Positive	Positive			Positive	IA
							Negative	
	Negative		Positive	Positive	IB			
				Negative			Negative	
	G3		Positive	Positive		Positive	IA	
						Negative		
		Negative	Positive	Positive		IB		
				Negative				Negative

Adapted from AJCC and NCCN

# AJCC 8th edition Prognostic Staging in Breast Cancer

- TNM Grouping

TNM	Grade	HER2	ER	PR	Stage	
T0 N1** M0 T1* N1** M0 T2 N0 M0	G1	Positive	Positive	Positive	IB	
			Negative	Negative	IIA	
		Negative	Positive	Positive		IB
			Negative	Negative	Positive	IIA
		G2	Positive	Positive	Positive	IB
				Negative	Positive	IIA
	Negative		Positive	Positive	IB	
			Negative	Negative	IIA	
	G3		Positive	Positive	Positive	IB
				Negative	Positive	IIA
		Negative	Positive	Positive	IIB	
			Negative	Negative		Positive

Adapted from AJCC and NCCN

# AJCC 8th edition Prognostic Staging in Breast Cancer

- TNM Groups

TNM	Grade	HER2	ER	PR	Stage	
T2 N1*** M0 T3 N0 M0	G1	Positive	Positive	Positive	IB	
			Negative	Negative	IIA	
		Negative	Positive	Positive	IIB	
			Negative	Negative	IIB	
		G2	Positive	Positive	Positive	IB
				Negative	Negative	IIA
	Negative		Positive	Positive	IIB	
			Negative	Negative	IIB	
	G3		Positive	Positive	Positive	IB
				Negative	Negative	IIB
		Negative	Positive	Positive	IIB	
			Negative	Negative	IIIA	
			Negative	Positive	Positive	IIIB
				Negative	Negative	IIIB

Adapted from AJCC and NCCN

# AJCC 8th edition Prognostic Staging in Breast Cancer

- TNM Group

TNM	Grade	HER2	ER	PR	Stage	
T0 N2 M0 T1* N2 M0 T2 N2 M0 T3 N1*** M0 T3 N2 M0	G1	Positive	Positive	Positive	IIA	
			Negative	Negative	IIIA	
		Negative	Positive	Positive		IIA
			Negative	Negative	Positive	IIIA
		G2	Positive	Positive	Positive	IIA
				Negative	Negative	IIIA
	Negative		Positive	Positive	IIA	
			Negative	Negative	Positive	IIIA
	G3		Positive	Positive	Positive	IIB
				Negative	Negative	IIIA
		Negative	Positive	Positive	IIIB	
			Negative	Negative		Positive

Adapted from AJCC and NCCN



# AJCC 8th edition Prognostic Staging in Breast Cancer

- TNM Group

TNM	Grade	HER2	ER	PR	Stage	
T4 N0 M0 T4 N1*** M0 T4 N2 M0 Any T N3 M0	G1	Positive	Positive	Positive	IIIA	
			Negative	Negative	IIIB	
		Negative	Positive	Positive		
			Negative	Negative		
		G2	Positive	Positive		Positive
				Negative	Negative	IIIB
	Negative		Positive	Positive		
			Negative	Negative		
	G3		Positive	Positive	Positive	
				Negative	Negative	
		Negative	Positive	Positive		
			Negative	Negative	IIIC	

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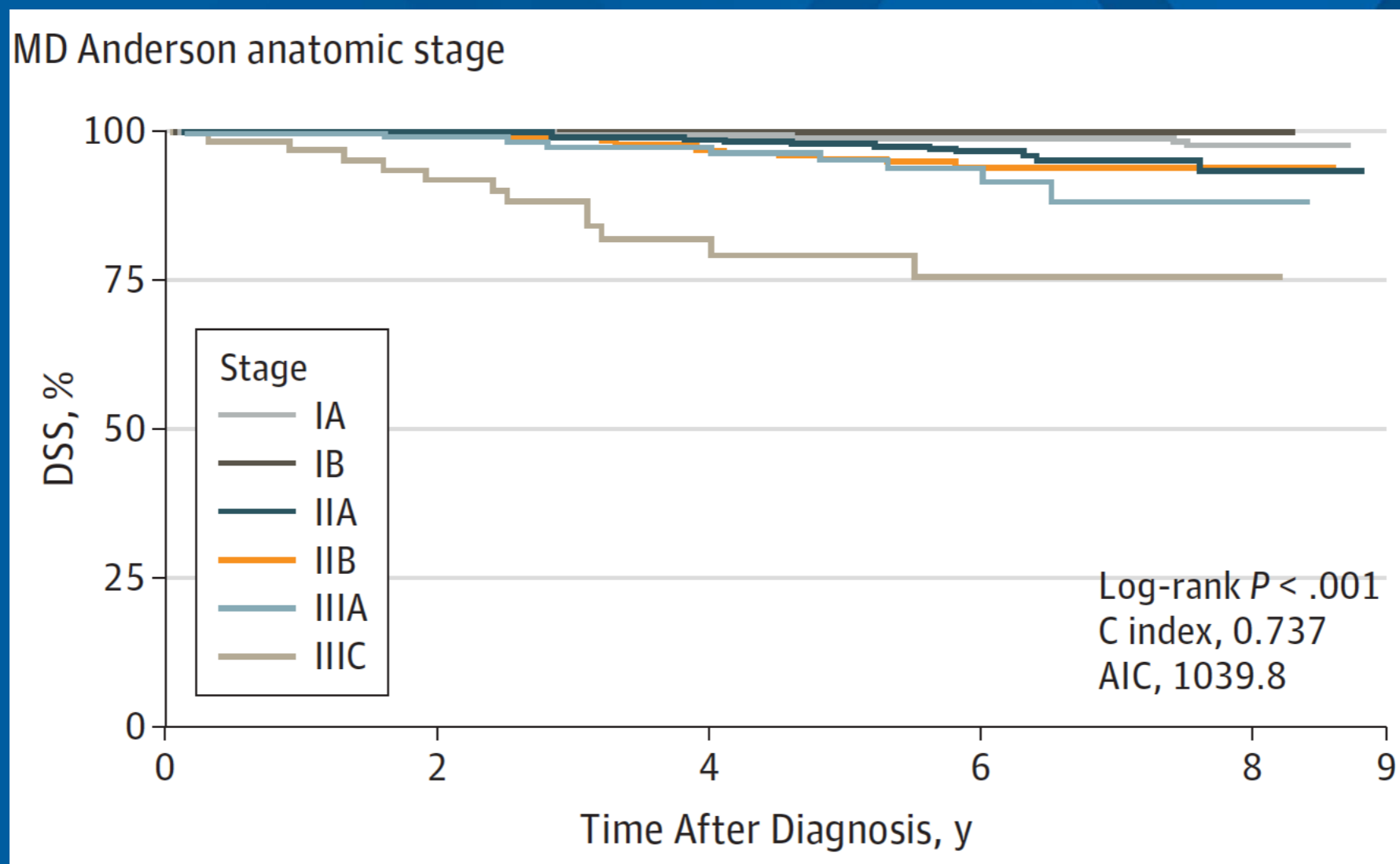
- TNM Group
  - if Oncotype DX RS of low risk
  - if MammaPrint of low risk

<b>TNM</b>	<b>Grade</b>	<b>HER2</b>	<b>ER</b>	<b>PR</b>	<b>Stage</b>
T1 N0 M0 T2 N0 M0	Any	Negative	Positive	Any	IA

Adapted from AJCC and NCCN

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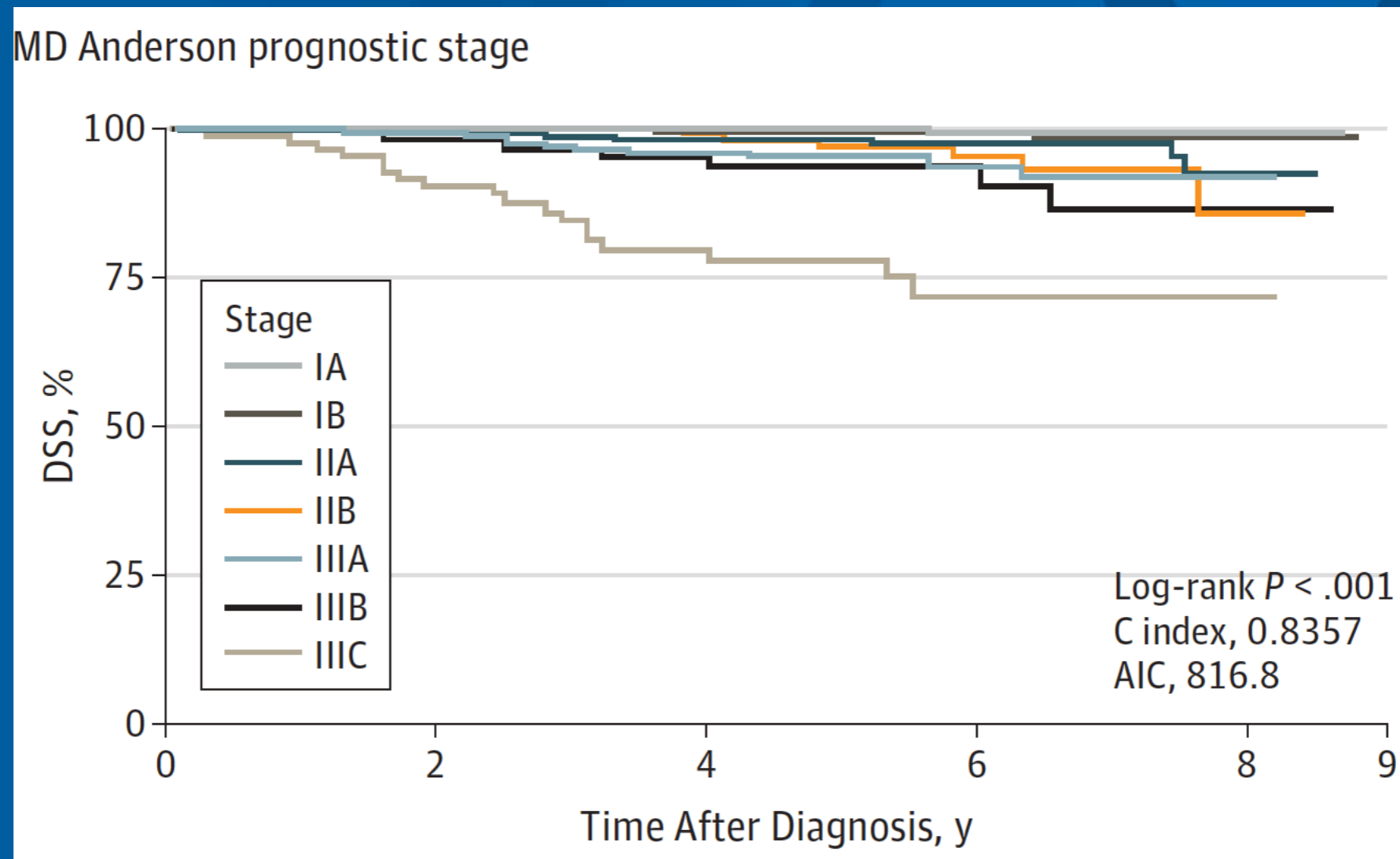
- Improved ability to prognosticate:



Weiss et al. JAMA Oncol. 2018;4(2):203-209

# AJCC 8th edition Prognostic Staging in Breast Cancer

- Improved ability to prognosticate:



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# AJCC 8th edition Prognostic Staging in Breast Cancer

- Questions