

Impact of Obesity on Clinical Outcomes of Breast Cancer and Other Tumors and the Relevance of Race & Ethnicity

Adetunji T. Toriola, MD, PhD, MPH

Professor of Surgery

William H. Danforth Washington University Physician-Scientist Scholar

Washington University School of Medicine

Co-Lead, Cancer Prevention and Control Program

Siteman Cancer Center



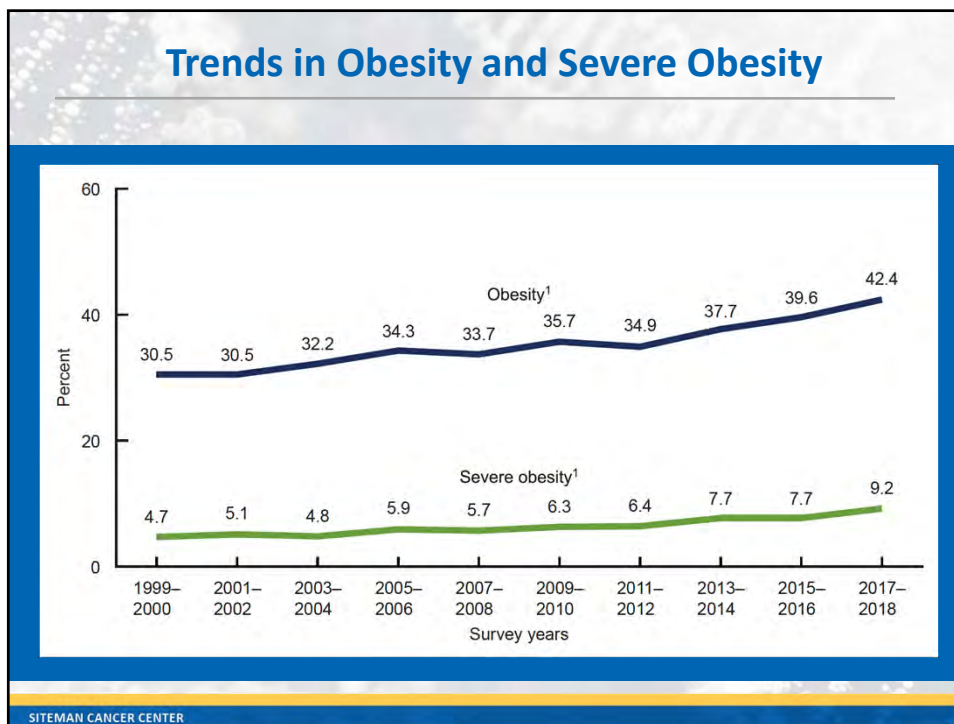
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Overview

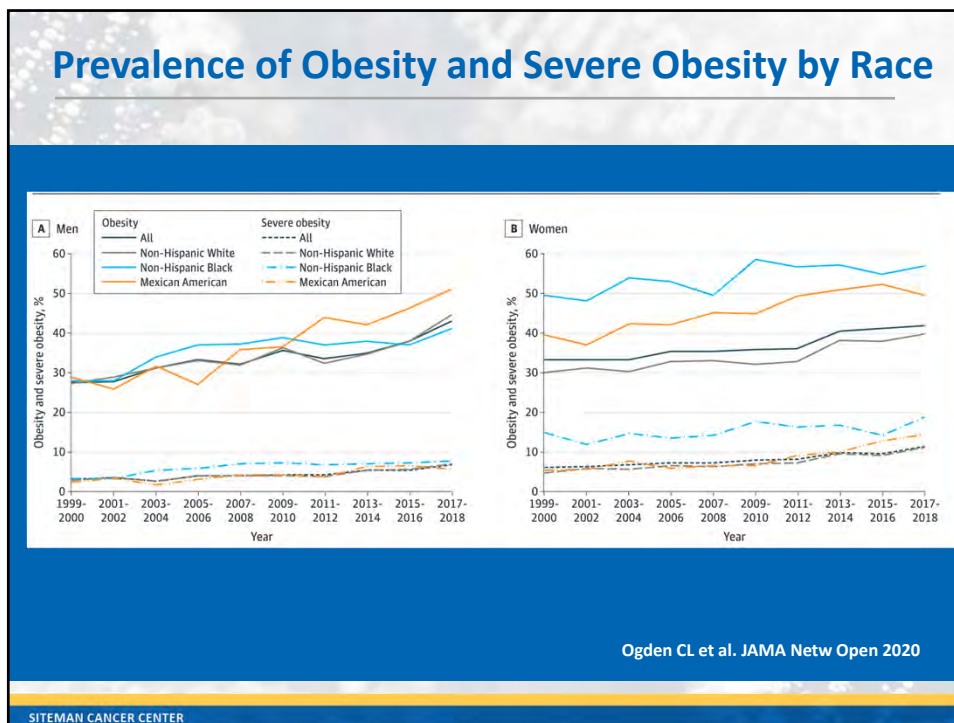
1. Trends in obesity in the US
2. Racial disparities in breast cancer outcomes
3. Obesity and clinical outcomes in breast cancer
 - Associations with race?
4. Conclusions

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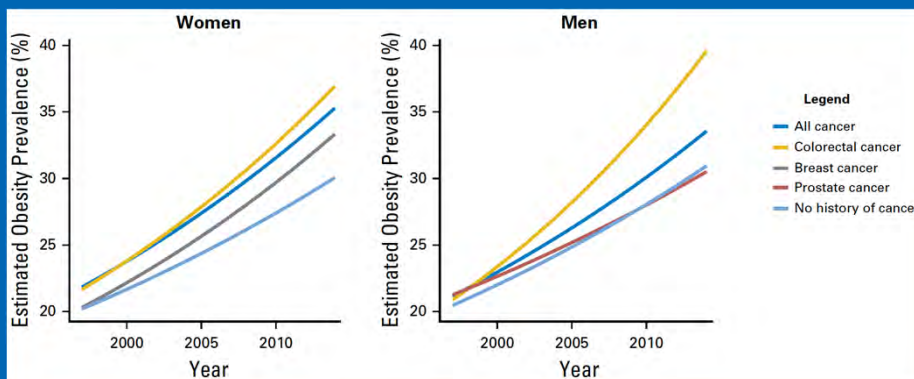


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Obesity Prevalence Increased More Rapidly in Cancer Patients than in the General Population



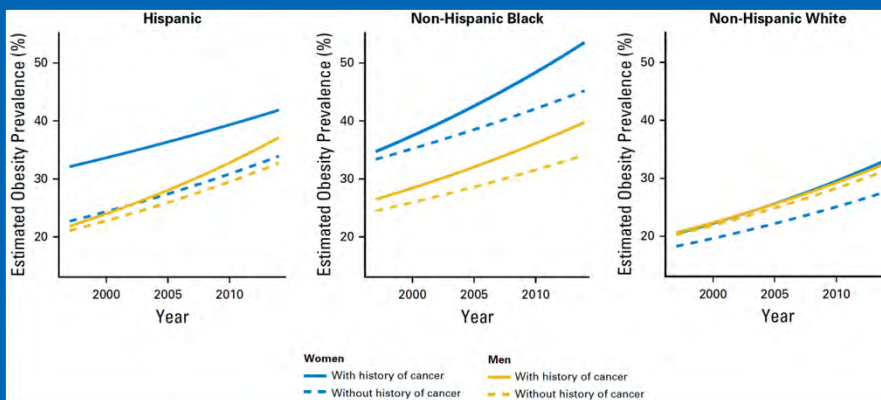
➤ Annual increase in obesity prevalence - 3.0% in breast cancer survivors.

Greenlee H et al. JCO 2016

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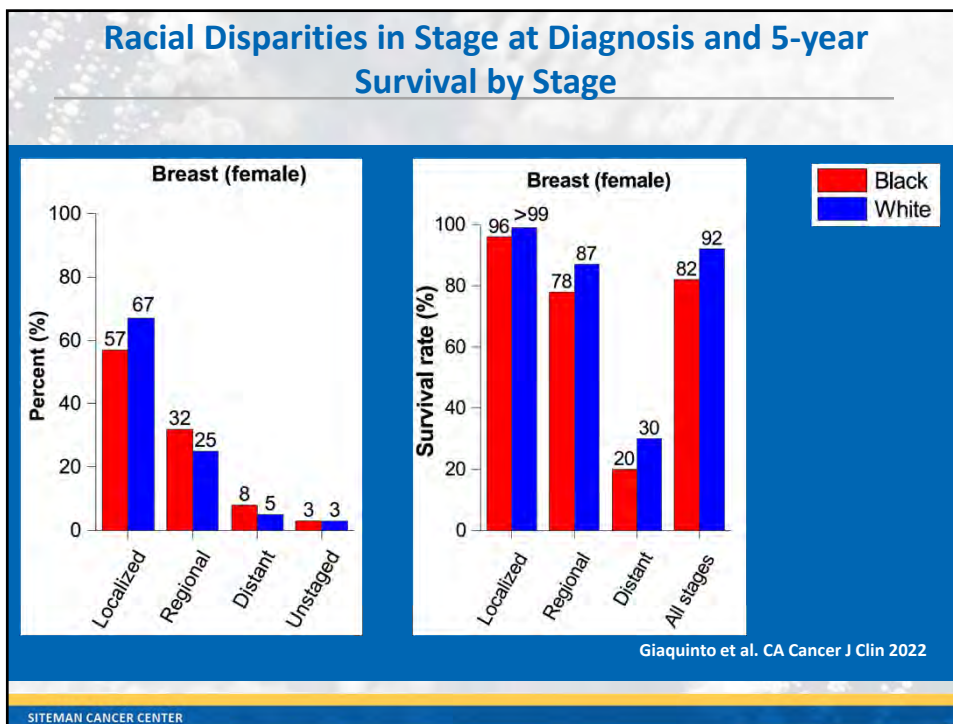
Trends in Obesity in Cancer Patients, by Race



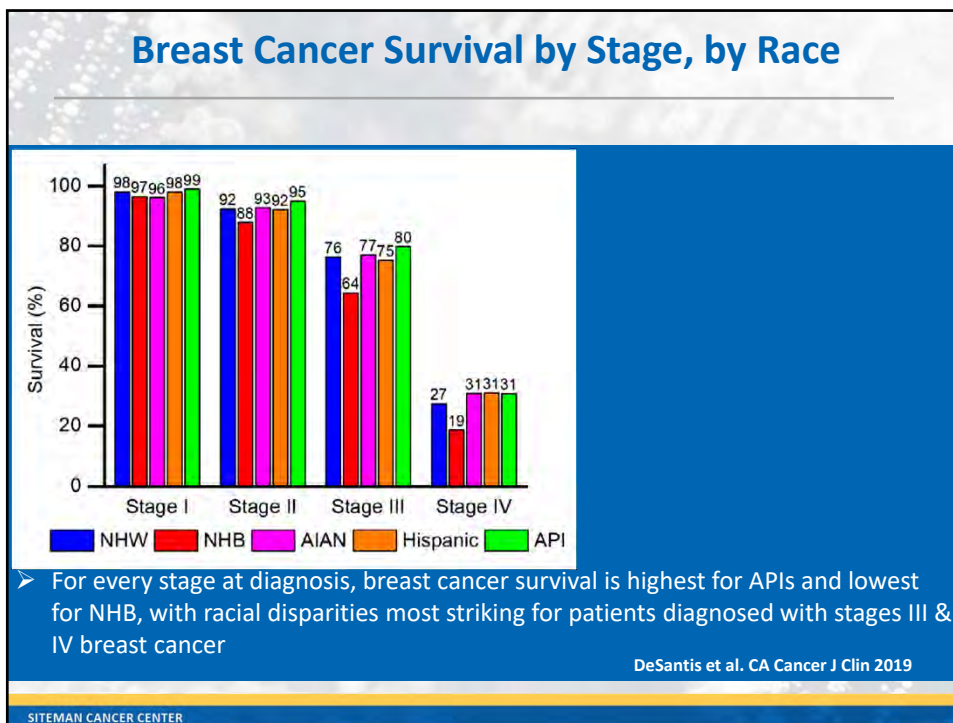
Greenlee H et al. JCO 2016

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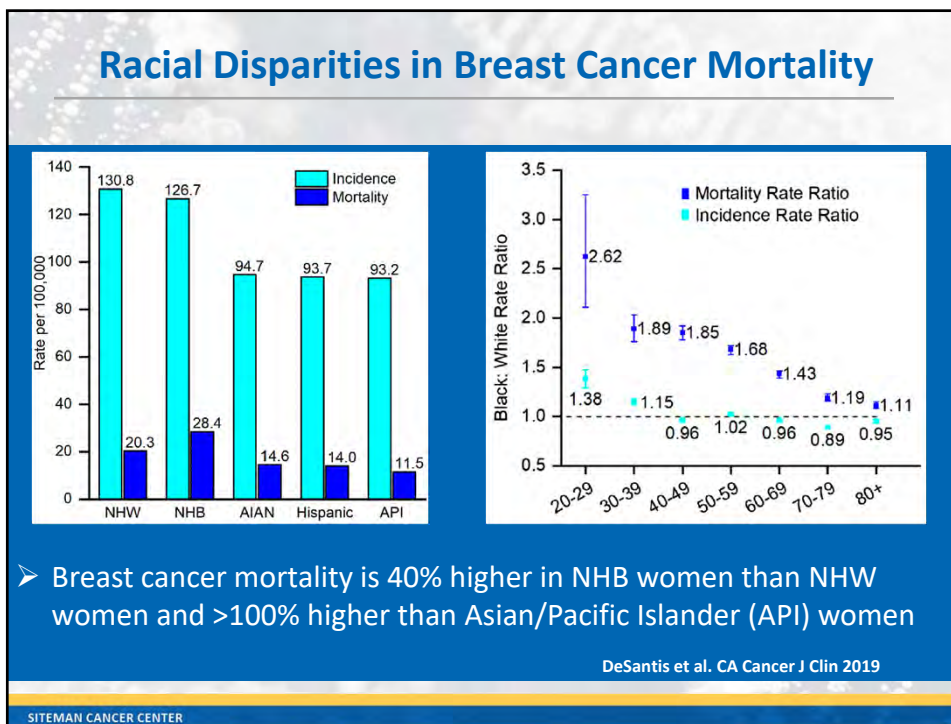
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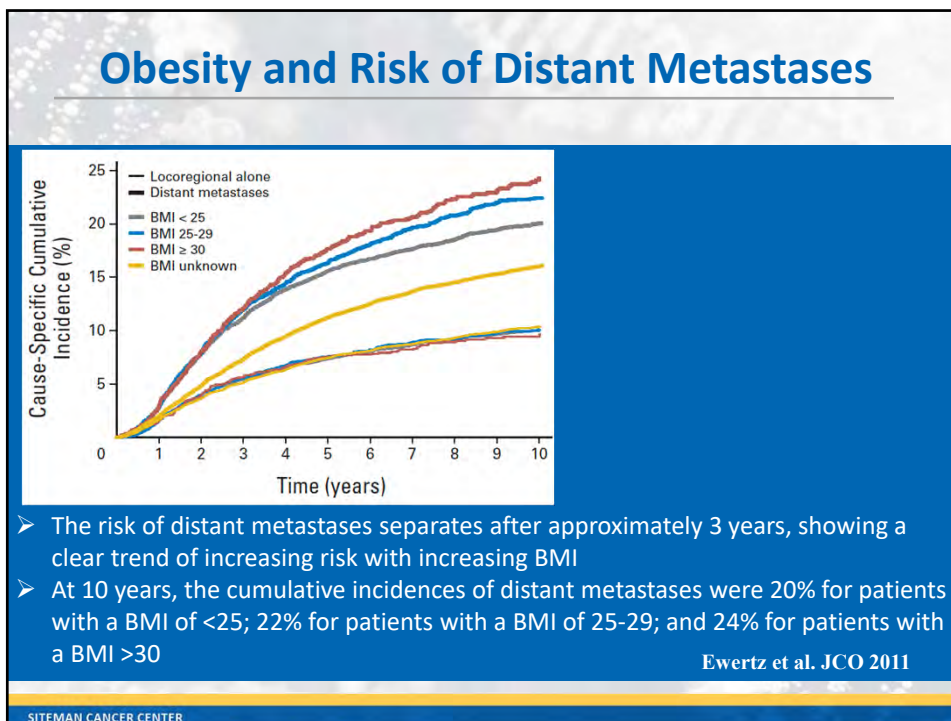
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Obesity and Response to Neo-adjuvant Therapy NeoALTT0 Trial

BMI categories	N	pCR (%)	Univariate analysis		Multivariate analysis*	
			OR (95%CI)	p value	OR (95%CI)	p value
HR-positive population	231	62 (26.8)				
Underweight/normal	121	39 (32.2)	1		1	
Overweight/obese	110	23 (20.9)	0.56 (0.31-1.01)	0.054	0.55 (0.30-1.01)	0.053
HR-negative population	223	98 (43.9)				
Underweight/normal	113	46 (40.7)	1	0.324	1	0.331
Overweight/obese	110	52 (47.3)	1.31 (0.77-2.22)		1.30 (0.76-2.23)	
			<i>p value HR+ vs HR-</i>		< 0.0001	
			<i>p value for interaction</i>		0.036	

- HR-positive tumors
 - Overweight or obesity was associated with decreased likelihood of achieving a pathological complete response
- HR-negative tumors
 - No differential effect of BMI on pCR for HR-negative tumors

Cosimo et al. BCR 2020

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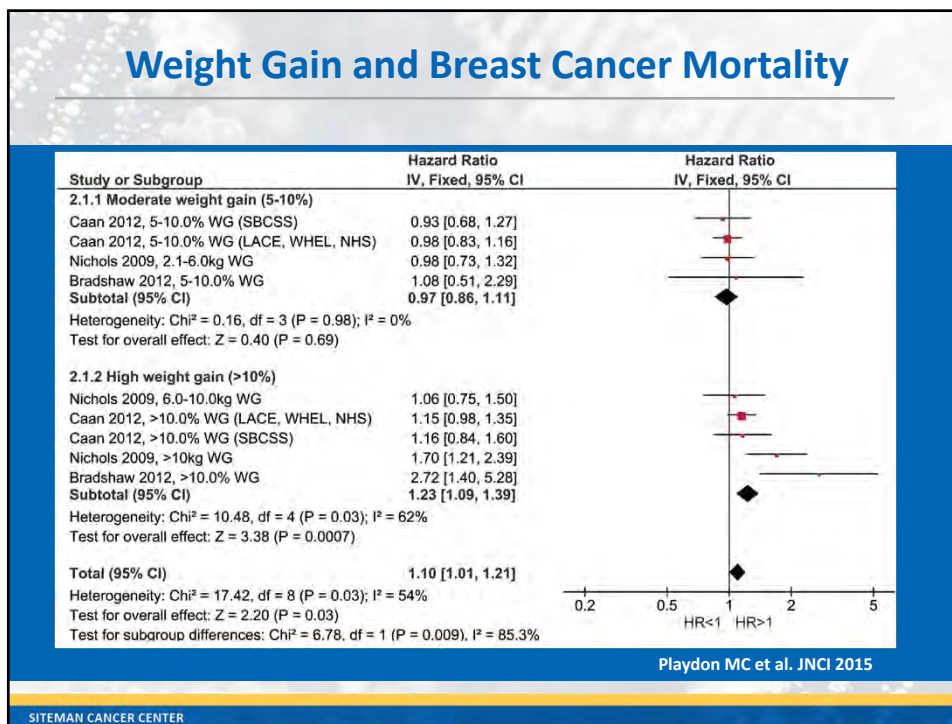
BMI and Breast Cancer Mortality

	BMI before diagnosis			BMI <12 months after diagnosis			BMI ≥12 months after diagnosis		
	N	RR (95% CI)	I ² (%) P _b	N	RR (95% CI)	I ² (%) P _b	N	RR (95% CI)	I ² (%) P _b
Total mortality									
Under versus normal weight	10	1.10 (0.92-1.31)	48% 0.04	11	1.25 (0.99-0.57)	63% <0.01	3	1.29 (1.02-1.63)	0% 0.39
Over versus normal weight	19	1.07 (1.02-1.12)	0% 0.88	22	1.07 (1.02-1.12)	21% 0.18	4	0.98 (0.86-1.11)	0% 0.72
Obese versus normal weight	21	1.41 (1.29-1.53)	38% 0.04	24	1.23 (1.12-1.33)	69% <0.01	5	1.21 (1.06-1.38)	0% 0.70
Obese versus non-obese	-	-	-	12	1.26 (1.07-1.47)	80% <0.01	-	-	-
Per 5 kg/m ² increase	15	1.17 (1.13-1.21)	7% 0.38	12	1.11 (1.06-1.16)	55% 0.01	4	1.08 (1.01-1.15)	0% 0.52
breast cancer mortality									
Under versus normal weight	8	1.02 (0.85-1.21)	31% 0.18	5	1.53 (1.27-1.83)	0% 0.59	1	1.10 (0.15-8.08)	-
Over versus normal weight	21	1.11 (1.06-1.17)	0% 0.66	12	1.11 (1.03-1.20)	14% 0.31	2	1.37 (0.96-1.95)	0% 0.90
Obese versus normal weight	22	1.35 (1.24-1.47)	36% 0.05	12	1.25 (1.10-1.42)	53% 0.02	2	1.68 (0.90-3.15)	67% 0.08
Obese versus non-obese	-	-	-	6	1.26 (1.05-1.51)	64% 0.02	-	-	-
Per 5 kg/m ² increase	18	1.18 (1.12-1.25)	47% 0.01	8	1.14 (1.05-1.24)	66% 0.01	2	1.29 (0.97-1.72)	64% 0.10
Cardiovascular disease related mortality									
Over versus normal weight	2	1.01 (0.80-1.29)	0% 0.87	-	-	-	-	-	-
Obese versus normal weight	2	1.60 (0.66-3.87)	78% 0.03	-	-	-	-	-	-
Per 5 kg/m ² increase	2	1.21 (0.83-1.77)	80% 0.03	-	-	-	-	-	-
Non-breast cancer mortality									
Over versus normal weight	-	-	-	5	0.96 (0.83-1.11)	26% 0.25	-	-	-
Obese versus normal weight	-	-	-	5	1.29 (0.99-1.68)	72% 0.01	-	-	-

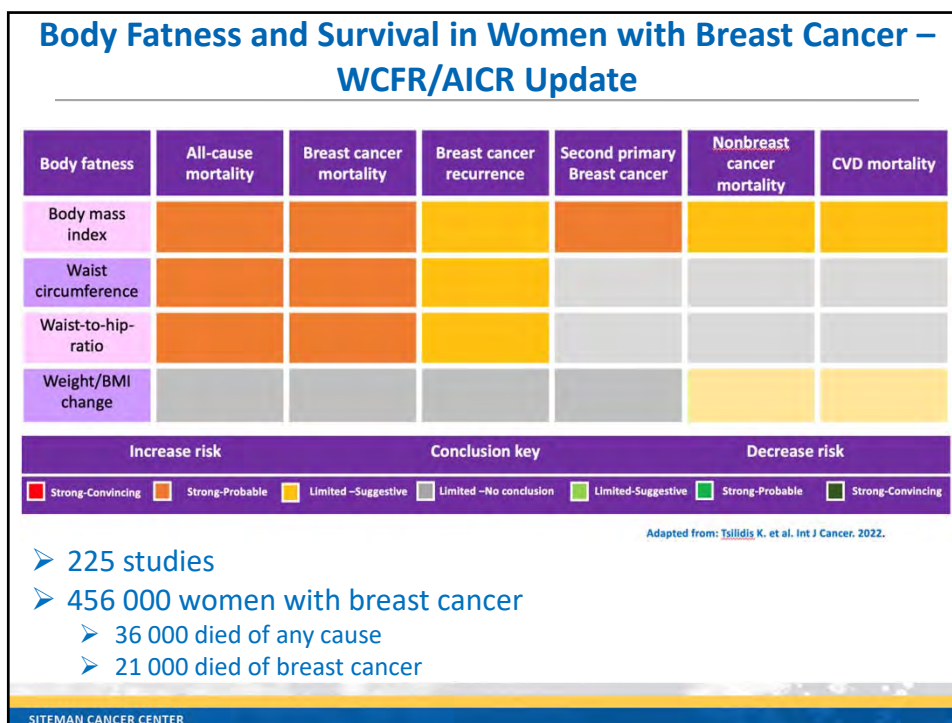
Chan DS et al. Ann Oncol 2014

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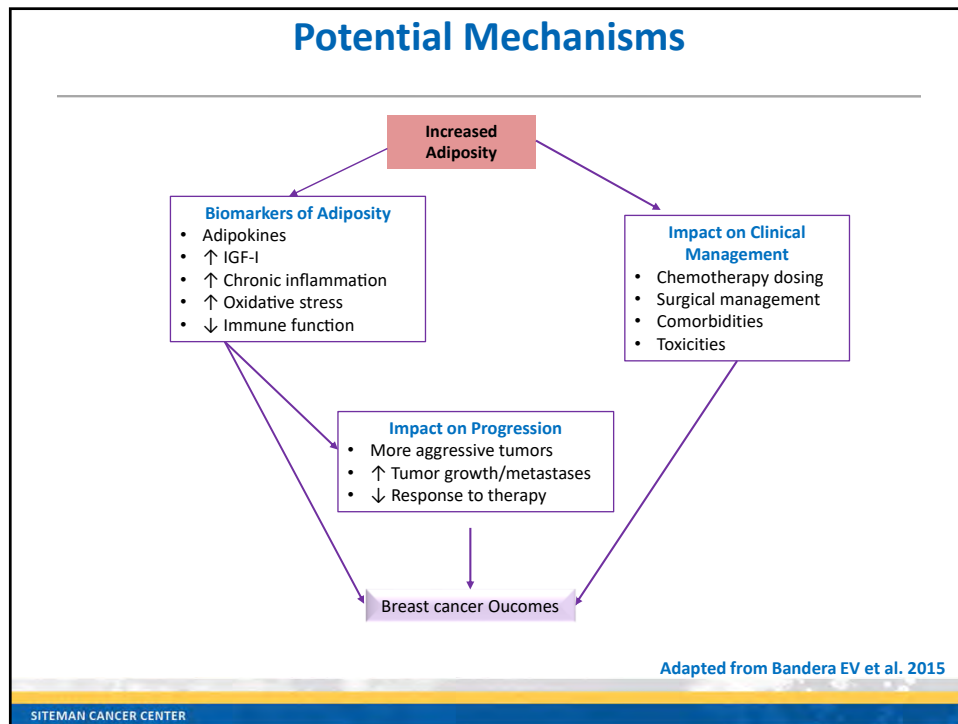
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Obesity and DFS, OS – Impact of Race?

- Limited number of studies have evaluated the interactions of race and obesity on clinical outcomes in breast survivors.
- Findings inconsistent

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Obesity and DFS, OS – Impact of Race?

1. Multiethnic Cohort Study
 - Obesity was associated with a higher risk of all-cause and breast cancer–specific mortality compared with high-normal BMI. No differences were noted across ethnic groups
2. E1199 Phase III Trial
 - Self-reported Black race was associated with worse survival in non-obese patients, but not in obese patients.

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Obesity and DFS, OS – Impact of Race? Women’s CARE Study

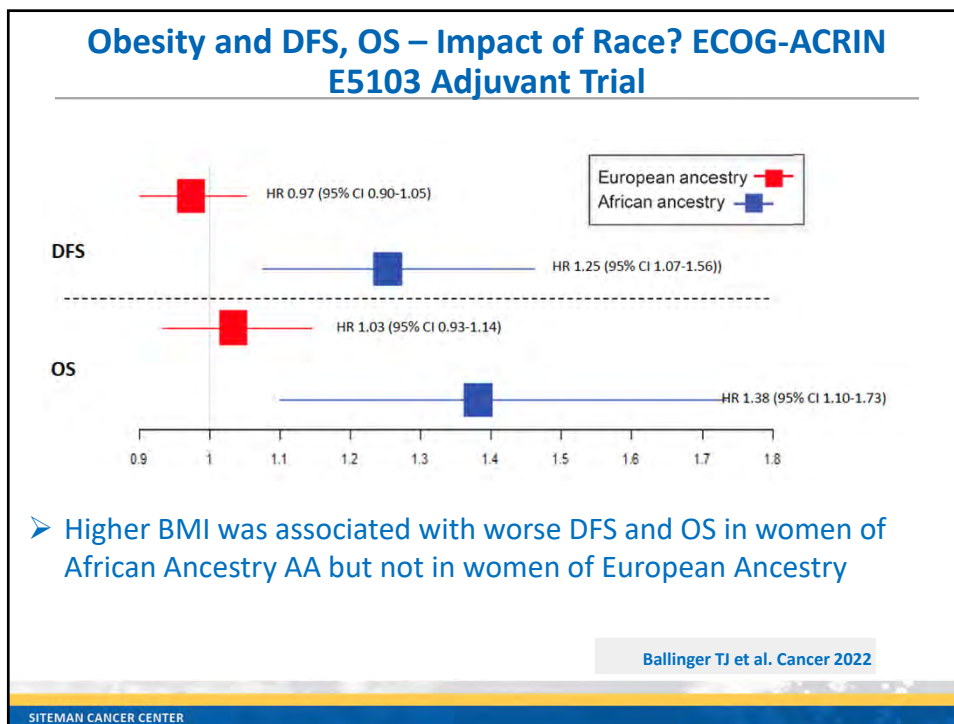
Variable and BMI (kg/m ²)	Person-Years	All-Cause Mortality			Breast Cancer–Specific Mortality		
		No.	RR	95% CI	No.	RR	95% CI
Overall							
< 20	4134	82	0.89	0.70 to 1.14	65	0.86	0.65 to 1.12
20-24.9	17,336	423	1.00	Ref	348	1.00	Ref
25-29.9	9,700	287	0.99	0.84 to 1.15	226	0.99	0.83 to 1.18
≥ 30	6,142	261	1.23	1.04 to 1.47	189	1.20	0.99 to 1.46
P trend			.01			.03	
White women							
< 20	3,557	61	0.92	0.69 to 1.22	47	0.88	0.64 to 1.21
20-24.9	12,979	257	1.00	Ref	207	1.00	Ref
25-29.9	5,267	115	1.03	0.82 to 1.29	90	1.04	0.81 to 1.34
≥ 30	2,764	101	1.54	1.21 to 1.96	72	1.46	1.11 to 1.92
P trend			.001			.005	
Black women							
< 20	577	21	0.87	0.55 to 1.38	18	0.84	0.51 to 1.39
20-24.9	4,357	166	1.00	Ref	141	1.00	Ref
25-29.9	4,433	172	0.91	0.73 to 1.13	136	0.91	0.72 to 1.16
≥ 30	3,378	160	1.03	0.81 to 1.29	117	1.02	0.79 to 1.33
P trend			.63			.66	
White v black P for homogeneity of trend			.03			.08	

- Black women had a higher risk of mortality than white women: RR – 1.33.
- Compared with women with normal BMI, those with obesity had a 23% greater risk of all-cause mortality and 20% greater risk of breast cancer–specific mortality.
- Associations in NHW women, but not among Black women

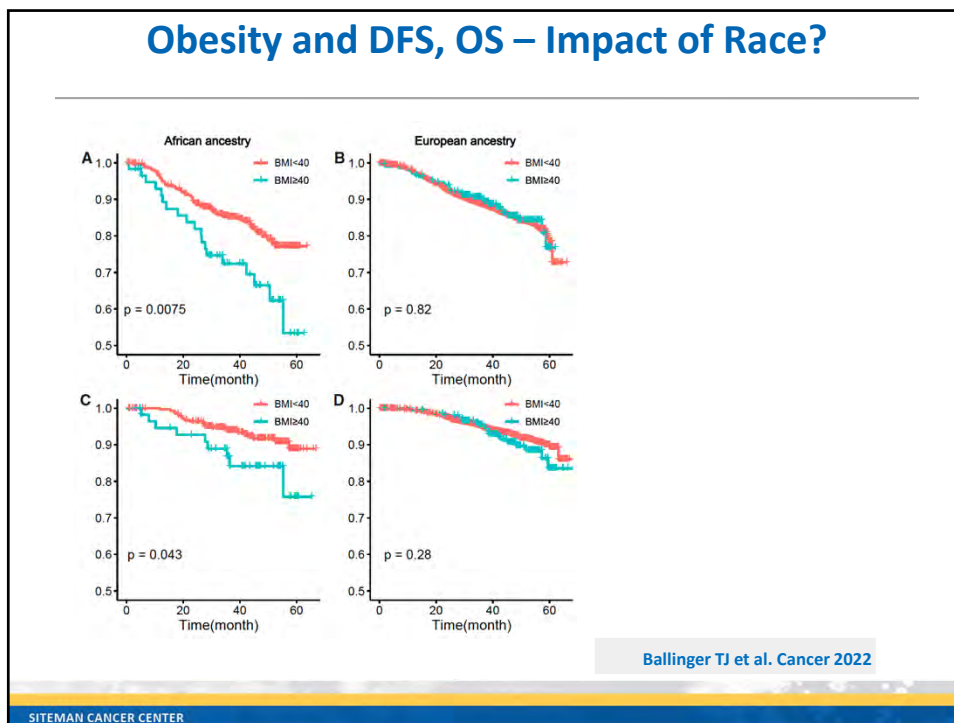
Lu et al. JCO 2011

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Obesity and Cancer-Specific Mortality - Meta-analysis

Disease	Studies, No.	HR (95% CI)	P value
Bladder or UTUC	3	1.36 (0.96-1.93)	.08
Breast	36	1.23 (1.15-1.32)	.004
CRC	13	1.24 (1.16-1.33)	.002
Gastroesophageal	2	0.83 (0.58-1.16)	.28
Head and neck	3	1.35 (0.27-6.74)	.70
Hepatobiliary	1	0.79 (0.50-1.24)	.31
Lung	3	0.53 (0.30-0.92)	.02
Ovarian	4	1.06 (0.82-1.37)	.61
Pancreas	3	1.28 (1.05-1.57)	.01
Prostate	15	1.26 (1.08-1.47)	.001
RCC	4	1.08 (0.58-2.00)	.80
Uterine	6	1.02 (0.75-1.39)	.86

Petrelli F et al. JAMA Network Open 2021

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Obesity and Cancer Recurrence - Meta-analysis

Disease	Studies, No.	HR (95% CI)	P value
Bladder or UTUC	3	1.42 (0.92-2.20)	.11
Breast	34	1.14 (1.10-1.19)	.002
CRC	12	1.15 (1.01-1.30)	.02
Gastroesophageal	1	1.62 (1.13-2.32)	.005
Head and neck	3	1.03 (0.48-2.20)	.92
Hepatobiliary	2	1.06 (0.73-1.53)	.73
Lung	2	0.55 (0.18-1.62)	.28
Melanoma	1	0.79 (0.69-0.90)	.006
Ovarian	2	1.04 (0.92-1.17)	.52
Prostate	11	1.29 (1.07-1.56)	.003
RCC	4	0.69 (0.41-1.14)	.15
Sarcoma	1	0.89 (0.47-1.68)	.72
Uterine	2	0.98 (0.45-2.11)	.97

Petrelli F et al. JAMA Network Open 2021

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Obesity and Clinical Outcomes in Breast Cancer - Impact of Race?

➤ Food for Thought

- Racial Disparities in Breast cancer mortality and survival
- NHB and Hispanic women have high rates of obesity
- Unclear if the associations of obesity with breast cancer outcomes differ by race
- If they do, what proportion of the racial disparities in breast cancer mortality is mediated by obesity?

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Clinical Management

- Adopt a multidisciplinary approach to weight management in overweight/obese breast cancer survivors
- Because of the higher prevalence of obesity and the higher mortality from breast cancer in NHB women, adopting a targeted approach at weight management, PA and diet after diagnosis in NHB patients could help reduce racial disparities in cancer mortality

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Conclusions - ACS/ASCO Guidelines

1. Weight
 - It is recommended that clinicians counsel survivors to achieve and maintain healthy weight, and if overweight or obese, limit consumption of high-energy foods and beverages and increase physical activity to promote and maintain weight loss
2. Physical activity
 - Engage in regular physical activity; avoid inactivity and return to normal daily activities as soon as possible after diagnosis,
 - aim for ≥ 150 min of moderate or 75 min vigorous aerobic exercise per week,
 - include strength training exercises ≥ 2 d per week,
 - emphasize strength training for women treated with adjuvant chemotherapy or hormone therapy
3. Nutrition
 - Achieve a dietary pattern that is high in vegetables, fruit, whole grains and legumes; low in saturated fats; and limited in alcohol consumption

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