

# **Mortality And Equitability of Radiation Treatment in Locally Advanced Rectal Cancer: A Review from A National Cohort**

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# Disclosures

No Disclosures

# Background

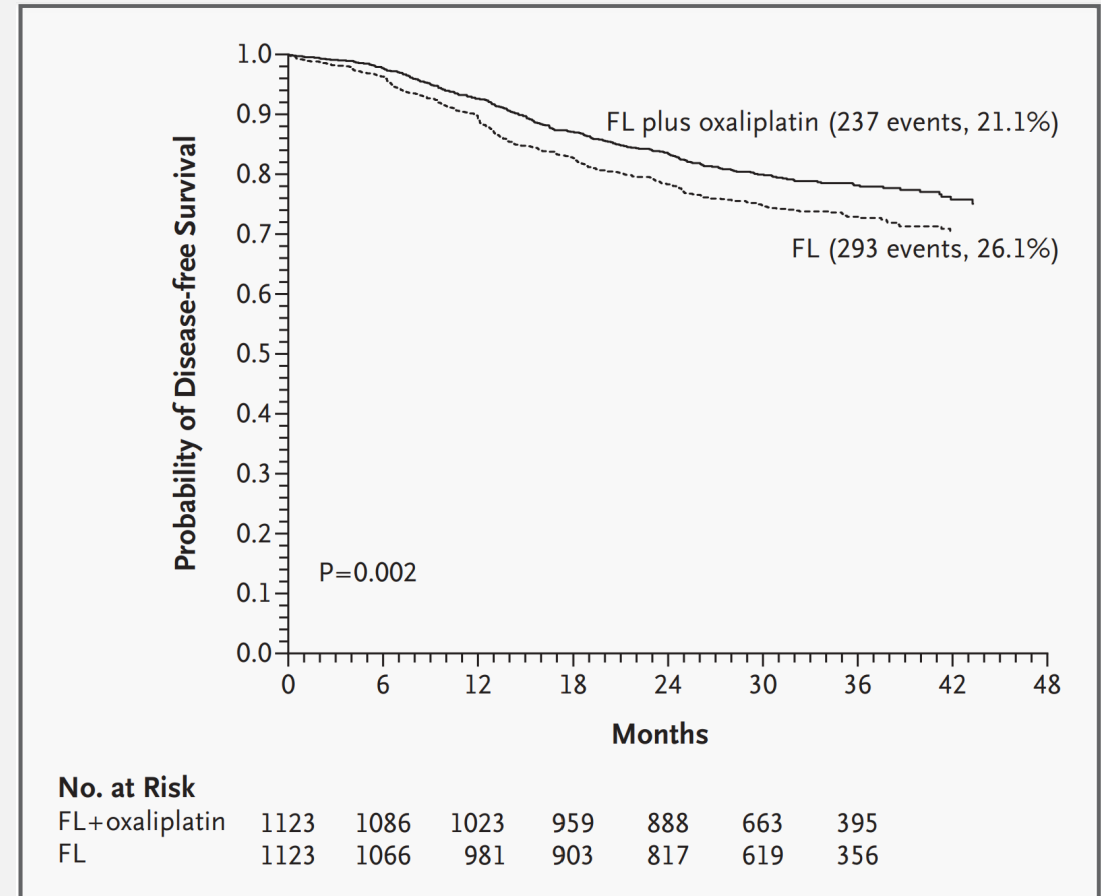
- GITSG 7175 (1988) n=227; 4 branches: no adjuvant, only chemo, only rads, or chemo-rads; adjuvant chemoradiation > no therapy for time to recurrence  $p=0.005$  and OS  $p=0.01$  with increased toxicity noted (61%)
- GITSG 7180 (1992) n=210; adjuvant chemoradiation + 5-FU w/ MeCCU vs. 5-FU; Similar DFS and OS
- NSABP R-01 (1988) n=555; 3 branches, no adjuvant, MOF, or radiation; MOF had > DFS *in males* ( $p=0.006$ ) and OS ( $p=0.05$ ), radiation group showed reduction in regional recurrence ( $p=0.06$ ) with no > DFS or OS
- EORTC 40741 (1984) n=247; neoadjuvant radiation vs. 5-FU, trend towards worse 5YS in 5-FU  $p=0.06$  but lower distant metastasis  $p=0.07$

In 1990, the NIH Consensus Conference released guidance

**“The best current adjuvant therapy for rectal cancer involves postoperative treatment with both chemotherapy and radiotherapy.”**

# 2004: Neoadjuvant Chemoradiation with FOLFOX

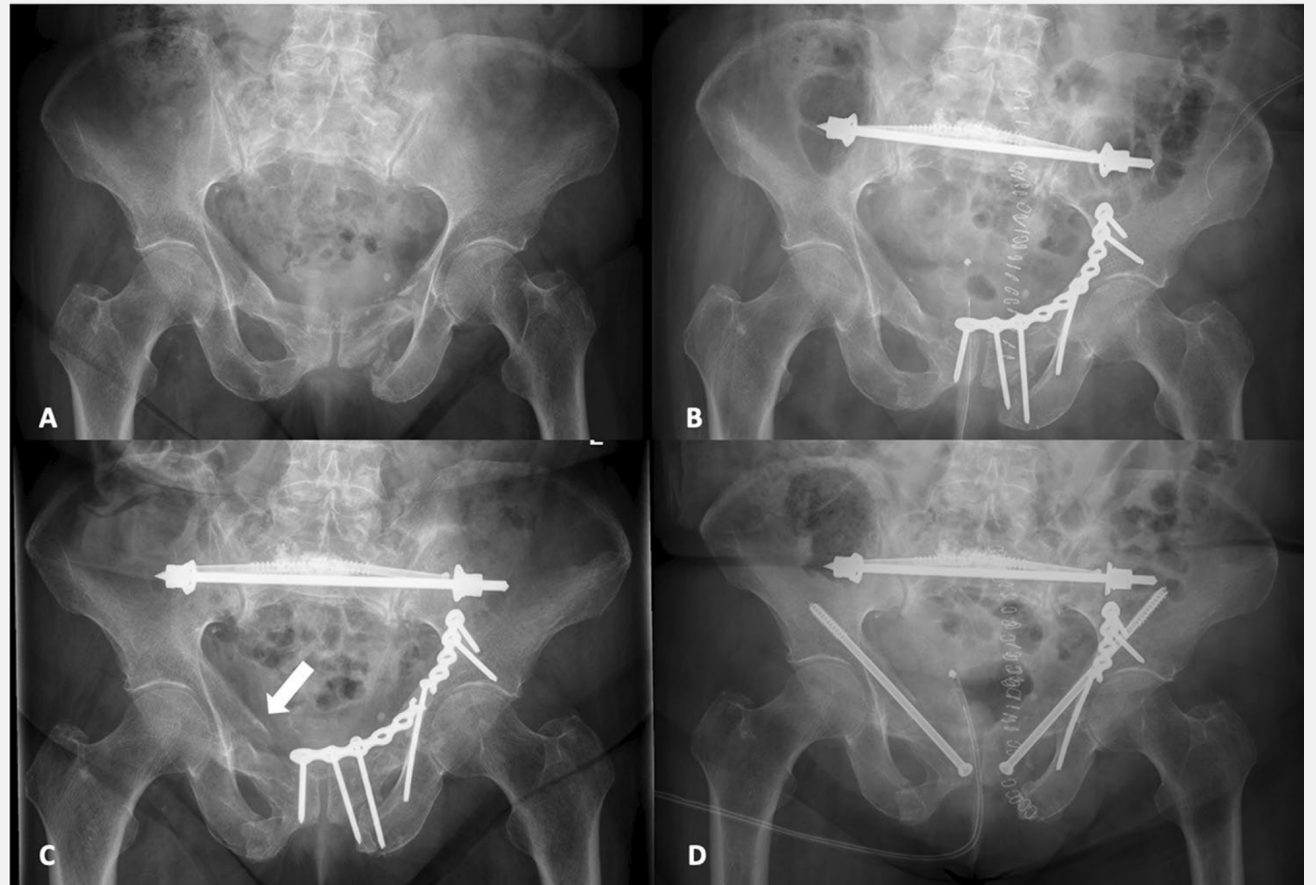
- Local control was improved *but not OS* with neoadjuvant therapy compared with adjuvant
- **Improved DFS with FOLFOX compared to 5-FU**
- *Both included chemoradiation therapy*



# Radiation Effects

Radiation causes **poor bowel control, urinary leakage, severe sexual dysfunction and pelvic fractures.**

In patients who receive chemoradiation more than those who receive chemotherapy alone



# More recently...

- In 2012 recruitment started for the large PROSPECT trial which gave radiation to only select patient with locally advanced disease. This trial was presented in 2023 with similar survival and recurrence in both groups
- Current Guidelines:
  - In MMR proficient, non-MSI high (most patients)
  - **Total Neoadjuvant Therapy (TNT)**
    - RAPIDO trial (2020) n=912; 1:1 neoadjuvant combo chemo (CAPOX or FOLFOX4) + rads vs. neoadjuvant capecitabine + rads; TNT had lower disease-related treatment failure at 3 years (HR= 0.75; 95%CI 0.60-0.95;  $p= 0.019$ ) with similar adverse events
    - PRODIGE 23 (2021) n=461; 1:1 neoadjuvant FOLFIRINOX + chemoradiation vs. neoadjuvant chemoradiation; TNT had improved 3-year DFS (HR=0.69; 95%CI 0.49-0.97;  $p=0.034$ ) with worse serious adverse events in the control group ( $p=0.0049$ )

# Aim

- To describe the use of radiation in patients from 2000 until 2015, the survival of these patients, and who was being treated with neoadjuvant therapy before and after 2015

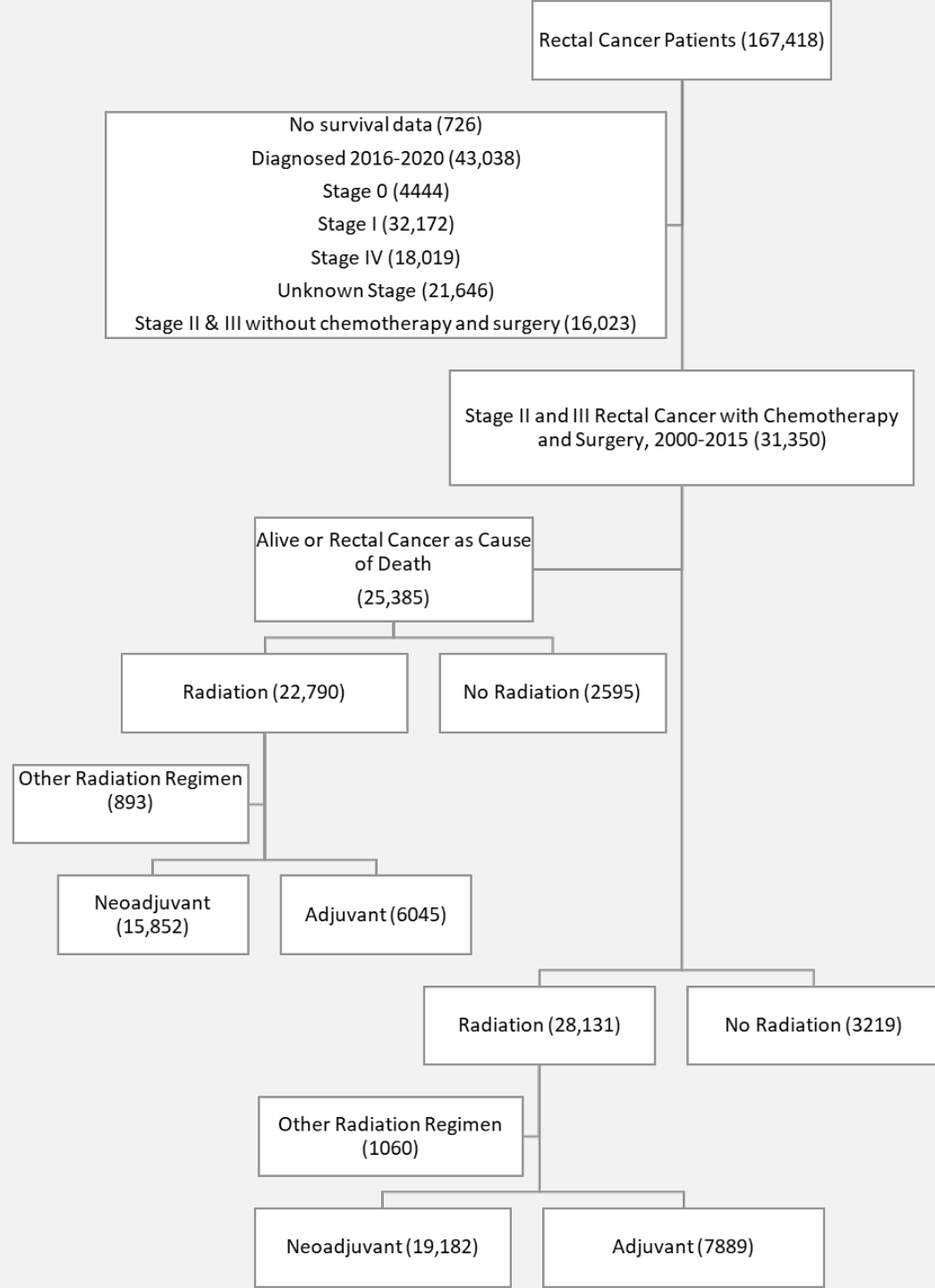
# Methods

- Retrospective Cohort
- NCI SEER database
- SPSS software used for calculations of hazard ratios (HR), confidence intervals (CI) and for the creation of Kaplan Meier diagrams
- Chi-squared analyses of groups were also calculated using SPSS



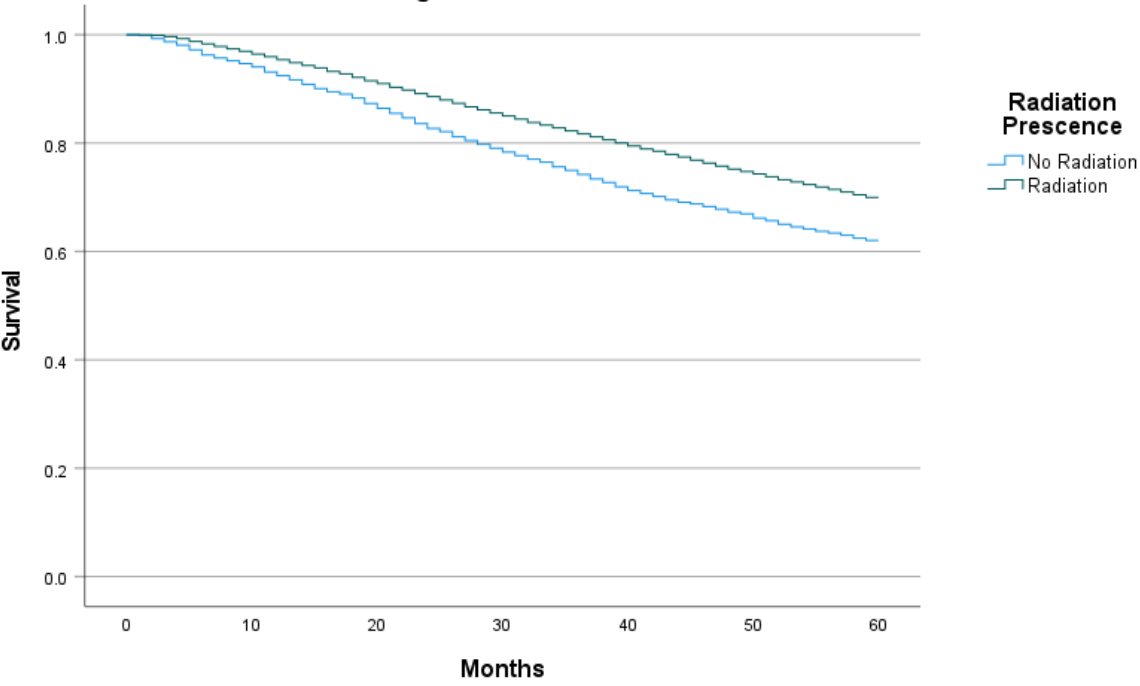
# Groups

- Stage II and III rectal cancer patients with known survival time
- Pre-2016 used for 5-year survival
- All other analyses were used pre and post 2015
- All Patients vs. Rectal Cancer as the cause of death
- Radiation vs. No Radiation
  - Radiation: Neoadjuvant vs. Adjuvant
- Groups were separated by race twice for separate analyses:
  - Non-Hispanic White vs. Other
  - Black vs. Not Black



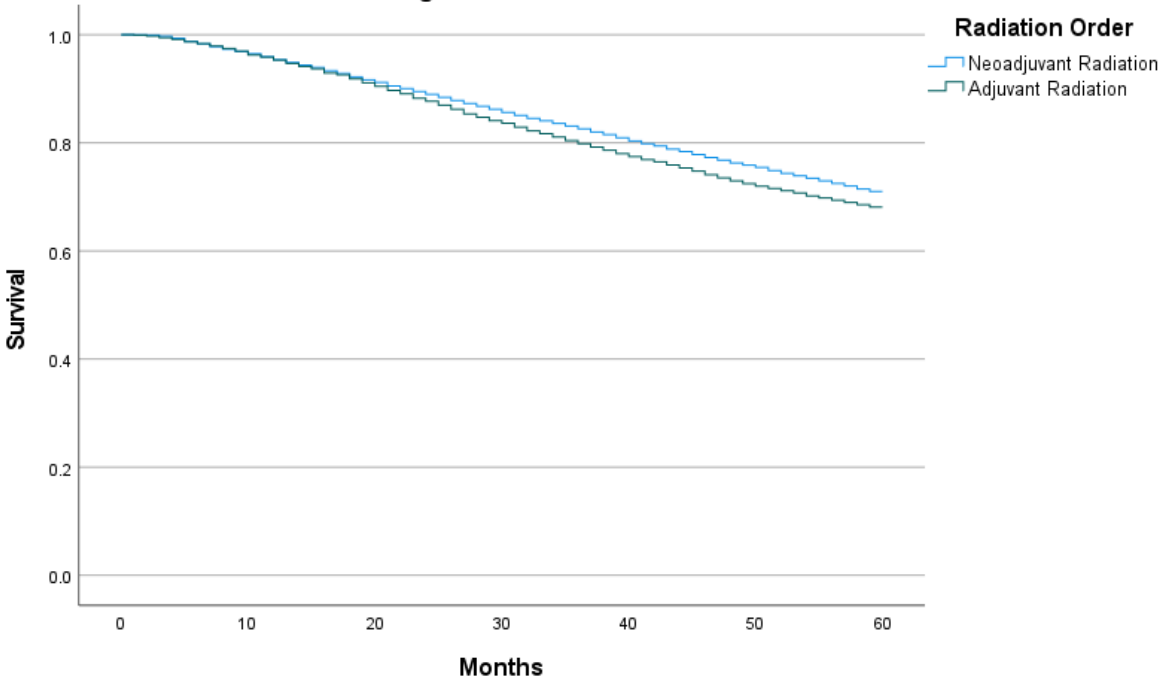
# All Patients Survival

Stage II-III Rectal Cancer Overall Survival



HR= 0.734, 95% CI 0.691 to 0.779, p<0.001

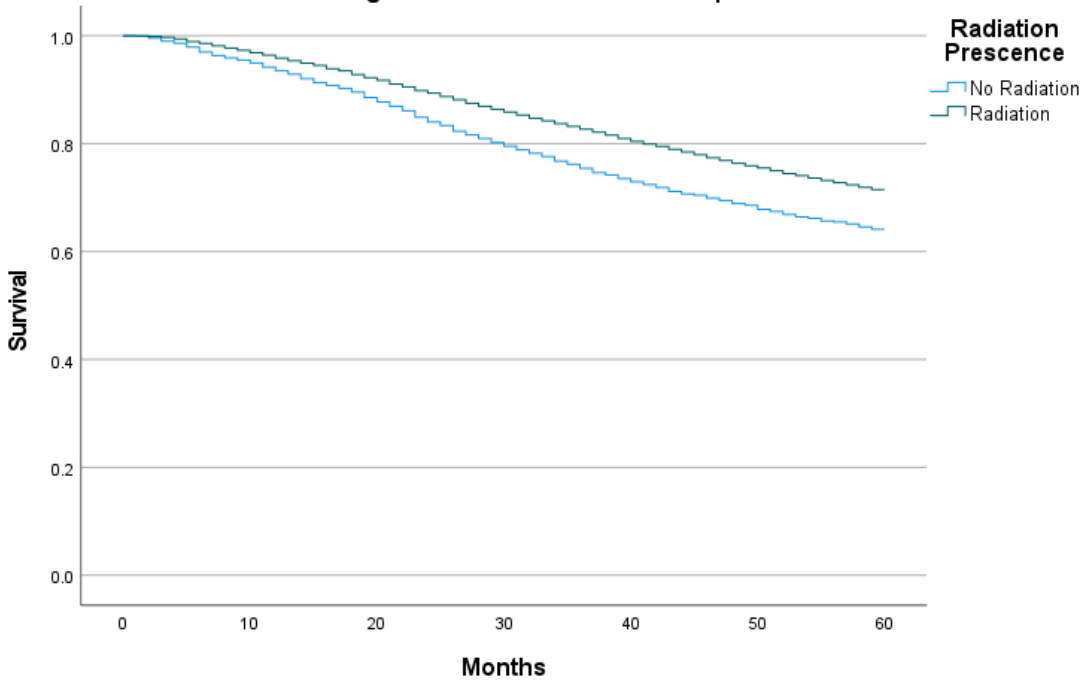
Stage II-III Rectal Cancer Overall Survival



HR= 1.125, 95% CI 1.073 to 1.179, p<0.001

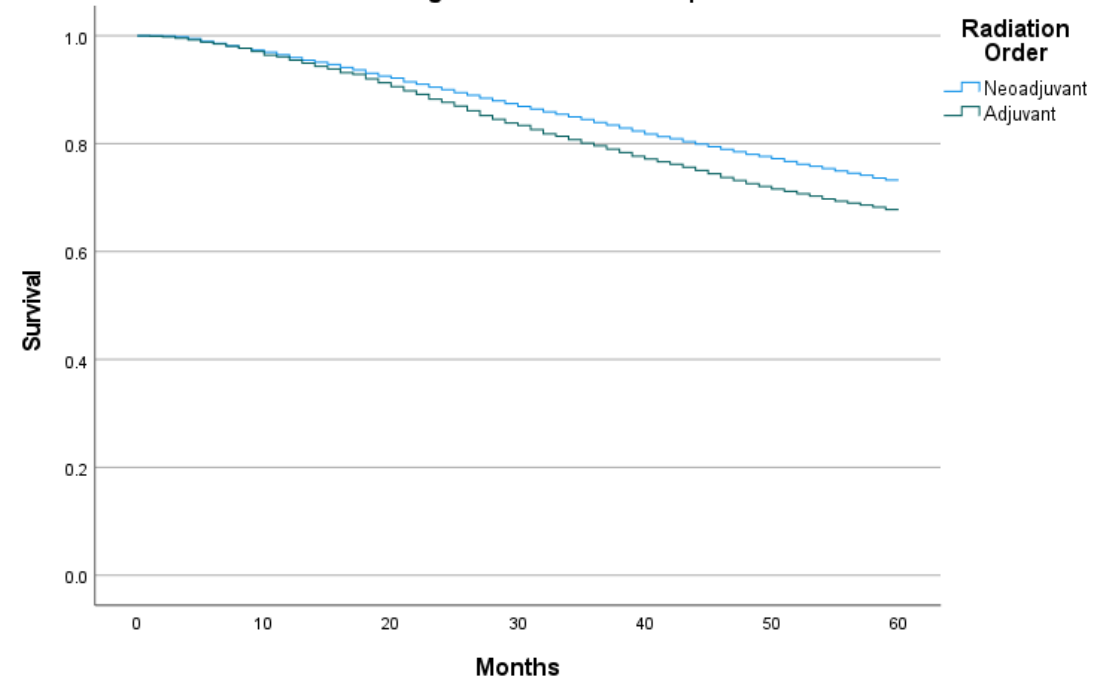
# Cancer-Specific Survival

Stage II-III Rectal Cancer Cancer-Specific Survival



HR= 0.743, 95% CI 0.693 to 0.796,  $p < 0.001$

Stage II-III Rectal Cancer Cancer-Specific Survival



HR= 1.252, 95% CI 1.187 to 1.321,  $p < 0.001$

# Radiation Use in Minorities

	Radiation Use		$\chi^2$ (df)	P	<i>Phi</i>
	Radiation	No Radiation			
	N (%)	N (%)			
Race and Origin (2000-2015)			0.087 (1)	0.768	0.002
Non-Hispanic White	19877 (70.7)	2283 (70.9)			
Other	8222 (29.9)	933 (29.0)			
Race and Origin (2016-2020)			2.632 (1)	0.105	0.015
Non-Hispanic White	6231 (64.1)	928 (66.3)			
Other	3488 (35.9)	471 (33.7)			
Race (2000-2015)			2.975 (1)	<b>0.085</b>	-0.010
Black	2169 (7.7)	276 (8.6)			
Not Black	25916 (92.3)	2939 (91.4)			
Race (2016-2020)			7.311 (1)	<b>0.007</b>	-0.026
Black	743 (7.7)	136 (9.8)			
Not Black	8938 (92.3)	1256 (90.2)			

# Radiation Order in Minorities

	Radiation Sequence		$\chi^2$ (df)	P	<i>Phi</i>
	Neoadjuvant	Adjuvant			
	N (%)	N (%)			
Race and Origin (2000-2015)			6.166 (1)	<b>0.013</b>	-0.015
Non-Hispanic White	13512 (70.5)	5678 (72.0)			
Other	5646 (29.5)	2204 (28.0)			
Race and Origin (2016-2020)			5.703 (1)	<b>0.017</b>	0.025
Non-Hispanic White	5330 (64.5)	679 (60.8)			
Other	2934 (35.5)	437 (39.2)			
Race (2000-2015)			0.575 (1)	0.448	-0.005
Black	1491 (7.8)	592 (7.5)			
Not Black	17658 (92.2)	7285 (92.5)			
Race (2016-2020)			0.459 (1)	0.498	-0.007
Black	639 (7.8)	80 (7.2)			
Not Black	7591 (92.2)	1033 (92.8)			

# Conclusions

- Stage II and III rectal cancer patients diagnosed from 2000-2015 who received chemotherapy, surgery, radiation and, specifically, neoadjuvant radiation had improved overall and cancer-specific mortality.
- Black patients were less likely to receive radiation and, as the standard of care was changing towards total neoadjuvant therapy after 2015, NHW patients were more likely than others to be treated with this regimen.