

Are We ‘Choosing Wisely’? A Case of Conventional Radiation Therapy in Older Women with Breast Cancer

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INTRODUCTION

- The American Society of Radiation Oncology's (ASTRO) Choosing Wisely (CW) initiative recommends against the use of conventional radiation therapy (CRT) in favor of hypofractionation for whole breast radiotherapy in patients with breast cancer (1).
- There is limited data available about how CW initiative impacted the use of CRT, especially among older women with early-stage breast cancer.

OBJECTIVES

- Examine the effect of the ‘Choosing Wisely’ initiative on the use of conventional radiation therapy for whole breast radiotherapy in older patients with early-stage breast cancer.
- Identify the predictors of conventional radiation therapy use in the post-CW period.

METHODS

Study Design, Data Source, and Study Cohort

- We conducted a retrospective observational cohort study using Surveillance, Epidemiology, and End Results (SEER)-Medicare-Area Resource File linked dataset.
- A total of 34,507 women aged ≥ 66 at the first primary diagnosis of stage I-II incident breast cancer during 2007-2015 who underwent lumpectomy and radiation therapy were included in the study.

Measures

- Conventional Radiation Therapy:** The proportion of patients who received CRT, defined as ≥ 5 weeks of radiation therapy, following lumpectomy were identified for the pre- and post-CW time periods.
- Covariates:**
 - Patient Demographic and Socioeconomic Characteristics:** Age at Cancer Diagnosis, Race/Ethnicity, Marital Status, Census Tract Median Household Income and Education, Poverty Level
 - Clinical Characteristics:** Grade of Tumor, Tumor Status, Tumor Laterality, Cancer Stage, Tumor Size, Regional Lymph Node Involvement, Comorbidity Index, Mental Health Conditions, Performance Status
 - External Healthcare Environmental Factors:** Location of Residence, SEER Region, Number of Oncology Radiologists in the Area of Patient's Residence, Facility Type

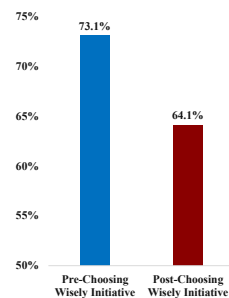
Statistical Analyses

- We conducted an interrupted time-series (ITS) analysis and segmented regression to determine if CW initiative decreased the use of CRT and also estimated the magnitude of change in the rates (2).
- We also conducted a multivariable logistic regression for the post-CW group to identify significant predictors of CRT use.

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RESULTS

Proportion of Patients With Early-Stage Breast Cancer Who Received CRT



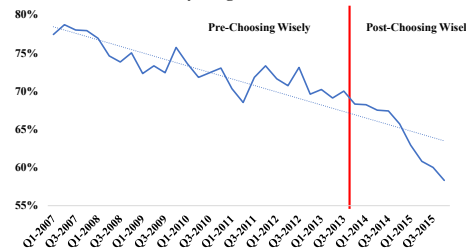
Findings from the Segmented Regression

	Estimate	Standard Error
Intercept	77.44*	0.0183
Quarters of the year	-0.31*	0.0011
Choosing Wisely initiative	2.37*	0.0366
Quarters* Choosing Wisely initiative	-1.12*	0.0058
Durbin Watson statistic	2.005	

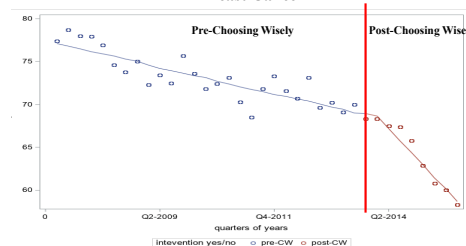
*p<0.0001

- A statistically significant 1.12% point per quarter decrease in the proportion of patients with early-stage breast cancer receiving CRT post-Choosing Wisely was observed.

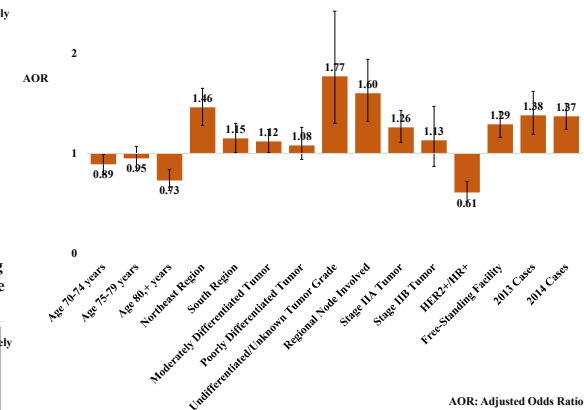
Unadjusted Trends in the Receipt of CRT in Patients With Early-Stage Breast Cancer



Interrupted Time Series Analysis of the Effect of Choosing Wisely on the Receipt of CRT in Patients With Early-Stage Breast Cancer



Predictors of CRT Use in Patients With Early-Stage Breast Cancer During The Post-Choosing Wisely Period



AOR: Adjusted Odds Ratio

- Compared to women age 66-69 years, relatively older women were less likely to receive CRT.
- Women who had HER2+/HR+ tumors were significantly less likely to receive CRT.
- Women with moderately differentiated and undifferentiated/unknown grade of tumor, and those diagnosed with stage IIA tumors were significantly more likely to receive CRT than their respective counterparts.
- Women who received radiation therapy from a free-standing facility were more likely to receive CRT than those who received radiation therapy in the hospital-based facility.

DISCUSSION

- Almost three fourth of older women with early-stage breast cancer who had whole breast radiotherapy in the pre-CW period received CRT. The proportion dropped by 9.0% in the post-CW period.
- The ASTRO's CW initiative appeared to be associated with the decline of the use of unnecessary CRT procedure in older women with early-stage breast cancer.
- Opportunities to reduce unnecessary CRT use in several subgroups of patients post-CW are identified from our study.

REFERENCES

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 - Penfold RB, Zhang F. Use of interrupted time series analysis in evaluating healthcare quality improvements. Academic Pediatrics 2013;13:S38-S44.
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