Predictors of Screening Mammography in Patients with Early vs. Advanced Stage Colorectal and Lung Cancer: A Population-Based Study

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Disclosures

Research reported in this publication was supported by the Radiological Society of North America Research and Education Foundation under award number RR1553.

Importance

- Annually, 455 cancer patients per 100,000 men and women are diagnosed.
- Cancer survivors at increased risk of developing second primary malignancies (16% of all cancer diagnoses).

http://i2.cdn.turner.com/cnnnext/dam/assets/120424065130-prostate-cancer-screening-blood-test-story-top.jpg

Objective

- Lung and colorectal cancer (CRC) survivorship does not increase risk of subsequent breast cancer.
- Screening for second primary malignancies is encouraged in early-stage cancer survivors.
- Routine screening may not benefit those presenting with advanced cancer, driving unnecessary healthcare costs.

http://www.medscape.com/viewarticle/845647; http://www.orlandogidoc.com/colorectal-cancer-screening.php

Objective

- To explore independent predictors of screening mammography utilization in Medicare beneficiaries with early vs. advanced stage cancer.

http://www.telegraph.co.uk/news/health/news/11648784/Breast-cancer-screening-cuts-deaths-by-40-per-cent.html
http://hopelovethrive.com/hopelovethrive/?p=615

Methods: Design

- Surveillance, Epidemiology, and End Results (SEER)-Medicare population-based study
  - Cancer registries from 18 states or metropolitan areas (covering approximately 28% of the US population)
  - Fee-for-service claims for medical care received by Medicare beneficiaries (both Part A and B benefits)
  - Claims linked for all SEER registry Medicare beneficiaries from the time of a person's Medicare eligibility until death

http://seer.cancer.gov/registries/

Methods: Study Population

Inclusion Criteria:

- Medicare-enrolled women ≥ **65** years registered in SEER between 2000 and 2011 with a diagnosis of CRC or lung cancer
- Continuously enrolled in Medicare Parts A and B

Exclusion Criteria:

- CRC or lung cancer not their first primary cancer
- Unknown month of cancer diagnosis
- Death or breast cancer diagnosis within the first three months after the CRC or lung cancer diagnosis.

Methods: Imaging Utilization

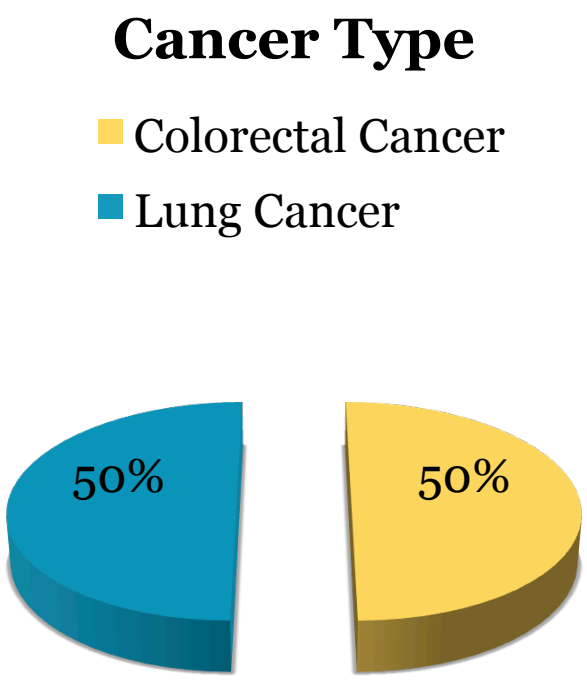
CPT and HCPCS billing codes used for identifying claims:

- At least one screening mammography between the follow-up start- and end-dates.
  - Follow-up start-date: 3 months after cancer diagnosis
  - Follow-up end-date:
    - 2-year after follow-up start-date
    - Diagnosis of breast cancer
    - Death
    - Censoring date of December 31, 2013, whichever came first

Independent predictors of use of screening mammography were assessed using logistic regression models

Results: Study Population Overview

- 128,098 women with colorectal or lung cancer
- 29% advanced cancer
- Mean age at diagnosis 77 years
- 86% White



Results: Imaging Utilization

At least One Screening Mammography

- 30% in early cancer patients
- 8% in advanced cancer patients

Results: Independent Predictors

Independent Predictors of Screening Mammography within 2 years after diagnosis.

	Early Stage Cancer	Advanced Cancer
Cancer type		
Colorectal vs. Lung	1.9 (1.8-1.9) (p<0.001)	1.3 (1.2-1.5) (p<0.001)
Age (reference "age > 80")		
65-69	3.4 (3.3-3.6) (p<0.001)	2.7 (2.4-3.1) (p<0.001)
70-74	2.9 (2.8-3) (p<0.001)	2.2 (2-2.6) (p<0.001)
75-79	2.2 (2.1-2.3) (p<0.001)	2 (1.7-2.2) (p<0.001)
Marital Status (reference "not married")		
Married	1.6 (1.5-1.6) (p<0.001)	1.4 (1.3-1.5) (p<0.001)

Numbers represent odds ratio and 95% confidence interval.

Results: Independent Predictors

	Early Stage Cancer	Advanced Cancer
Race (reference "African American")		
White	1. (1.1-1.2) (p<0.001)	0.9 (0.8-1) (p=0.35)
Other	0.9 (0.8-1) (p=0.02)	0.9 (0.7-1.1) (p=0.40)
Poverty index (reference "20-100%")		
0-<5%	1.6 (1.5-1.7) (p<0.001)	1.4 (1.2-1.5) (p<0.001)
5-<10%	1.4 (1.3-1.5) (p<0.001)	1.4 (1.2-1.6) (p<0.001)
10-<20%	1.2 (1.1-1.2) (p<0.001)	1.2 (1.1-1.4) (p=0.006)
SEER Registry (reference "Northeast")		
Midwest	1.1 (1-1.1) (p=0.02)	1 (0.9-1.1) (p=0.71)
Southeast	1.2 (1.1-1.2) (p<0.001)	1.1 (1.1-1.3) (p=0.02)
West	1.1 (1.1-1.2) (p<0.001)	1.1 (0.9-1.2) (p=0.43)

Numbers represent odds ratio and 95% confidence interval.

Results: Independent Predictors

Higher Screening in Advanced Cancer associated with:

- Colorectal cancer
- Younger age (< 80 year)
- Being married
- Favorable economic status

Higher Screening in Early Cancer associated with:

- Colorectal cancer
- Younger age (< 80 year)
- Being married
- Favorable economic status
- White race
- Certain Geographic area

Conclusion

In patients with advanced cancer, in whom screening for second primary malignancies is typically not beneficial, colorectal cancer, younger age, being married, and favorable economic status are all associated with screening mammography overutilization.

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Thank You!

Questions?

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