Mitigating Diagnostic Delays in Breast and Colorectal Cancer

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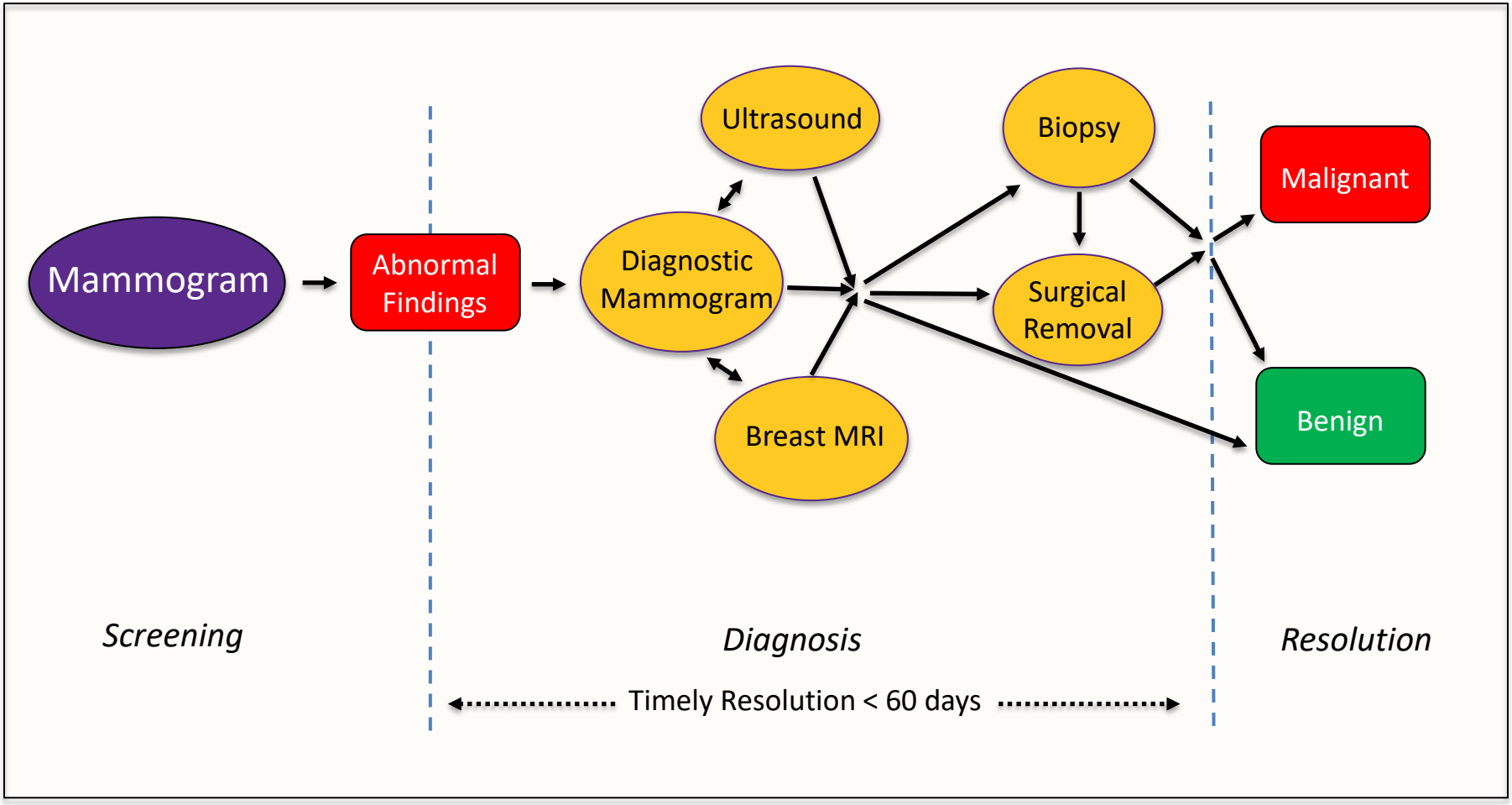
Breast Cancer Diagnostic Pathways



- Biennial mammograms are recommended for average risk women from age 40 to 75
- Chance of receiving an abnormal result across a women's screening years: 50%

Henderson et al. 2024; Elmore et al. 1998; Doubeni et al. 2018

Influences on Breast Cancer Diagnostic Delay

Patient

- Age
- SES
- Insurance Status
- Race/Ethnicity
- Knowledge/Attitudes /Beliefs
- Family History
- Breast Symptoms
- Health Status

Healthcare System

PCP
- EHR System
- Communication

Imaging Centers
- Accreditation Status
- Procedure Volume
- Proportion of Screening vs Diagnostic Procedures
- Communication Procedures

Community

- SES
- Racial & Ethnic Composition
- Social Support
- Residential Segregation
- Facility Distance
- Transportation Access

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Reece et al. 2021; Schapira et al. 2018; Rosenberg et al. 2011; Plascak et al. 2014

Influences on Racial and Ethnic Inequities in Breast Cancer Diagnostic Delay

Patient

- Age
- SES
- Insurance Status
- Race/Ethnicity
- Knowledge/Attitudes /Beliefs
- Family History
- Breast Symptoms
- Health Status

Healthcare System

PCP

Imaging Centers

- Accreditation Status
- Radiologist Characteristics
- Imaging Quality

Community

- SES
- Racial & Ethnic Composition
- Social Support
- Residential Segregation
- Facility Distance
- Transportation Access

- Most research focuses on one socioecological level
- Studies examining multi-level influences on racial/ethnic inequities report mixed results
  - Impact of healthcare facility characteristics
  - Impact of community characteristics

Selove et al. 2016; Peterson et al. 2018; Molina et al. 2015; Fowler 2014; Miller-Kleinhenz et al. 2021; Lawson et al. 2022

Multilevel Contributors to Racial and Ethnic Inequities in Diagnostic Delay

Data Source

Carolina Mammography Registry - https://cmr.unc.edu/

- One of seven sites of the NCI-funded Breast Cancer Surveillance Consortium
- Collects patient and imaging center characteristics for enrolled imaging centers
- Houses breast cancer screening outcomes for over 700,000 women in North Carolina

Methods

Sample

- 25,114 women with abnormal mammograms between 2011 and 2019
  - 23,517 - index procedure was a screening mammogram
  - 1,622 - index procedure was a diagnostic mammogram
- Patient – Race, age, health insurance type, education, distance to facility, family history and screening history
- Imaging Center – Type, procedure volume, accreditation status, for profit status
- Community – Racial/Ethnic composition, residential segregation, poverty rate, severe housing burden, % of children in single parent households

Multilevel Contributors to Racial and Ethnic Inequities in Breast Cancer Diagnostic Delay

Methods

Outcomes

- Primary - % of women achieving resolution in 60 days; Secondary – Time to resolution

Analysis

- Mixed effects logistic regression; Cox proportional hazards
- Tested imaging center characteristics as mediators and community characteristics as moderators

Results

Table 1. Percentage of Women Achieving Resolution by Race/Ethnicity and Exam Type

Race/ Ethnicity	% Achieving Resolution in 60 Days (NBCCEDP* Benchmark – 75 % achieve resolution in 60 Days)	
	Screening Mammograms	Diagnostic Mammograms
Non-Hispanic White	60.78	81.99
Non-Hispanic Black	56.44	77.56
Hispanic/Latina	46.14	41.60

* CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP)

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Farr et al. 2024

Multilevel Contributors to Racial and Ethnic Inequities in Breast Cancer Diagnostic Delay

Table 2. Likelihood of Achieving Resolution by Race/Ethnicity and Exam Type

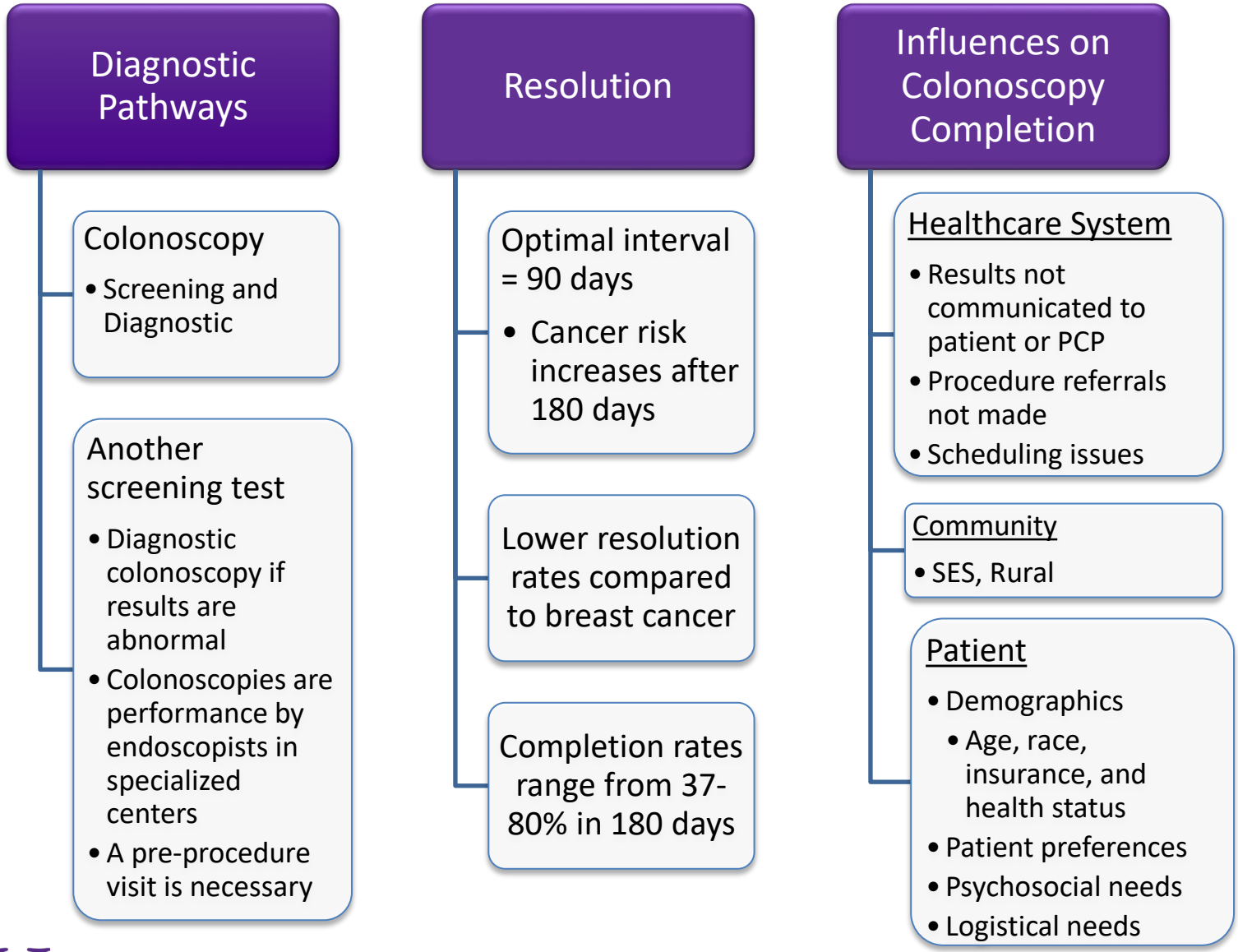
Race/ Ethnicity	Screening Mammograms		Diagnostic Mammograms	
	Resolution in 60 Days OR (CI)	Time to Resolution HR (CI)	Resolution in 60 Days OR (CI)	Time to Resolution HR (CI)
Ref: Non-Hispanic White	1.00	1.00	1.00	1.00
Non-Hispanic Black	**0.83 (0.78-0.89**	**0.87 (0.84-0.91)**	0.88 (0.65-1.19)	0.90 (0.79-1.02)
Hispanic/ Latina	**0.74 (0.60-0.91)**	**0.78 (0.68-0.89)**	0.56 (0.31-1.02)	0.75 (0.56-1.01)

* Bolded values are statistically significant

- Black women in more racially segregated areas took longer to achieve resolution than White women in those areas – Lost significance after adjustment
- Community characteristics had significant impacts on resolution of both type of exams
- Facility characteristics only impacted diagnostic exams
- Lack data on imaging center processes
  - Important for determining appropriate intervention strategies

Farr et al. 2024

Understanding Colorectal Cancer Diagnostic Delay



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Doubeni et al. 2018; Chubak et al 2016; Khoong et al. 2023; McCarthy et al. 2016; Mohl et al. 2023; Cornado et al. 2021

Programs Addressing Colorectal Cancer Screening and Diagnostic Delay

Colorectal Cancer Prevention Network at the University of South Carolina

- Partner with low resource primary care settings across South Carolina
- Provide colorectal cancer screening patient education, services, and patient navigation - https://www.crcfacts.com/index.html

Scaling Colorectal Cancer Screening Through Outreach, Referral, and Engagement (SCORE) Program

- One of eight research programs of the NCI-funded Accelerating Colorectal Cancer Screening and Follow-up through Implementation Science (ACCSIS) Program - https://accsis.rti.org/
- Investigated the effectiveness and implementation of an offsite mailed stool test program
- Partnered with two Federally Qualified Health Center systems in rural North Carolina
- Provided patient navigation to support diagnostic colonoscopy completion for those with abnormal stool tests

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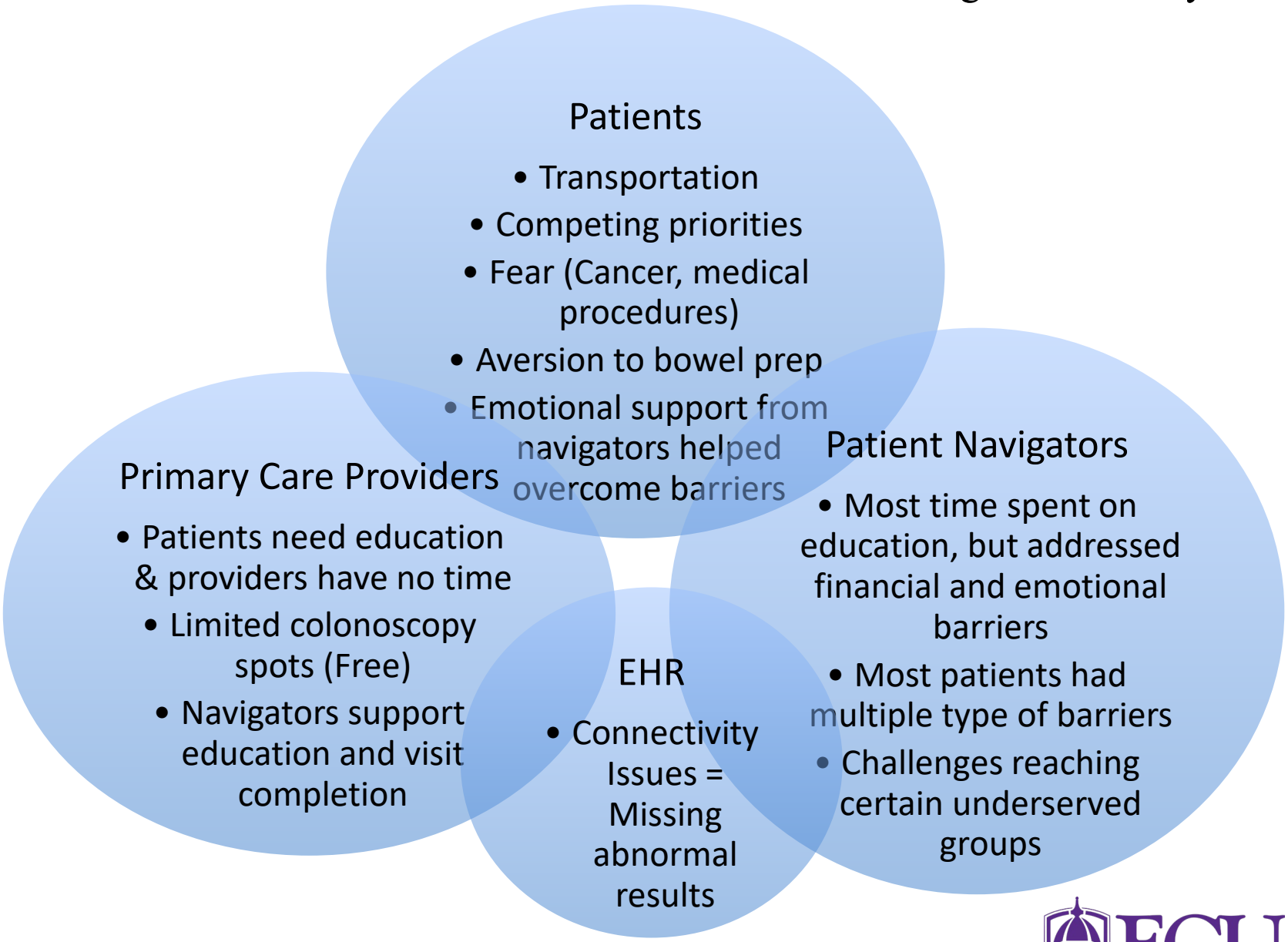
Eberth et al. 2018; Malo et al. 2021

A Closer Look at Contributors to Colorectal Cancer Diagnostic Delay



Farr er al. 2020; Cite O'Leary et al. 2023; Farr et al. in preparation

Mitigating Diagnostic Delays in Breast and Colorectal Cancer

Breast Cancer Delays

- More information is needed to understand clinical barriers to timely resolution, especially in imaging centers
- Shift from looking at diagnostic delay retrospectively from breast cancer patients and focus on improving data collection from active screening populations
- Additional research should identify characteristics of communities with longer resolution times and in need of additional intervention

Colorectal Cancer Delays

- While patient navigation has improved the resolution rates of abnormal colorectal results, timeliness remains an issue
- Future research should examine
    - What intervention strategies can be paired with patient navigation to reduce delays in colorectal cancer follow-up
    - Which combinations of strategies are effective in different contexts (rural areas, for patient with multiple co-morbidities)

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