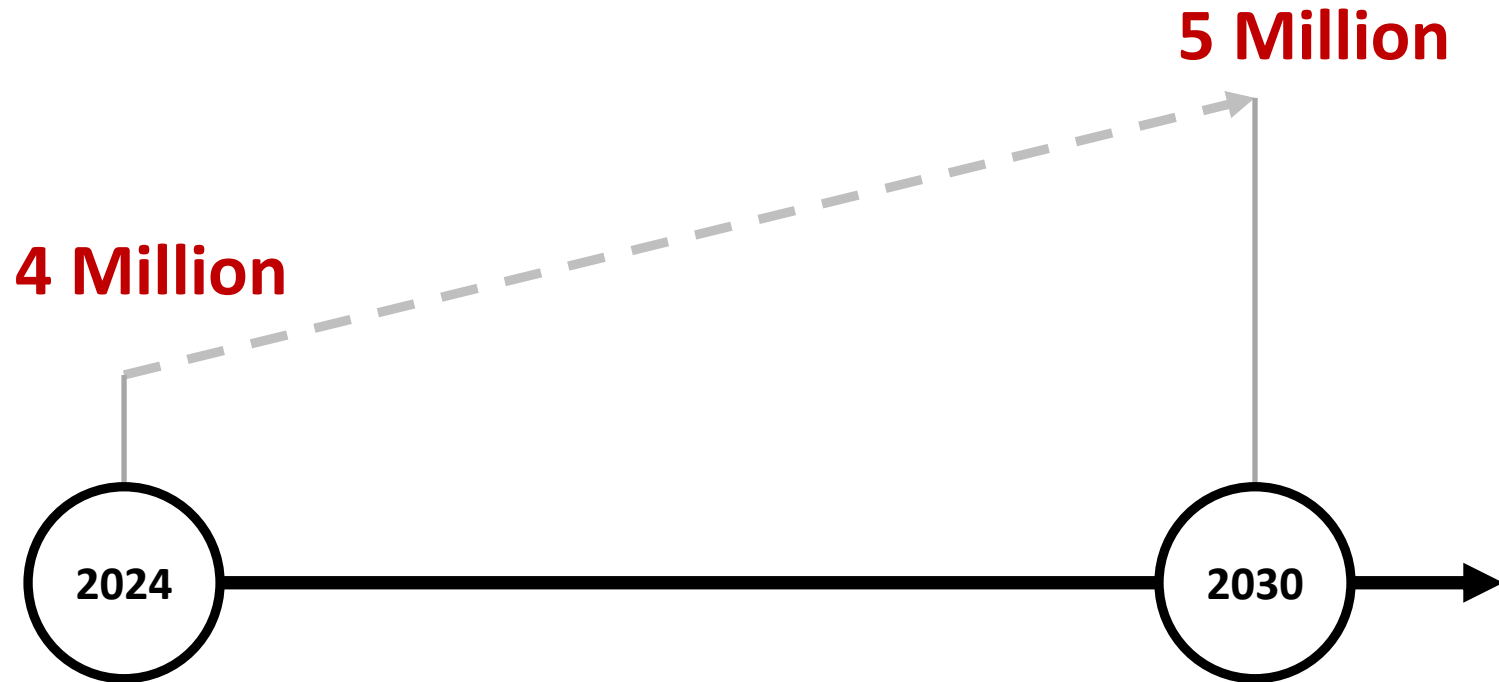


Breast cancer, diet and heart health: how the Pathways Study is informing Lifestyle Medicine

Isaac Ergas, PhD, MPH, MFA
Pathways Online Forum – Oct. 29th, 2024



There are currently over 4 million breast cancer survivors in the US and this number is estimated to increase



Awareness • Increased Screening • Improved Treatments

We found that women with breast cancer face a higher risk of developing **cardiovascular** and **cardiometabolic** outcomes



original reports

Risk of Cardiovascular Disease in Women With and Without Breast Cancer: The Pathways Heart Study

Heather Greenlee, ND, PhD^{1,2,3}; Carlos Iribarren, MD, MPH, PhD⁴; Jamal S. Rana, MD, PhD^{4,5}; Richard Cheng, MD, MSc^{2,3}; Mai Nguyen-Huynh, MD, MAS^{4,6}; Eileen Rillamas-Sun, PhD¹; Zaixing Shi, PhD^{1,7}; Cecile A. Laurent, MS⁴; Valerie S. Lee, MHS¹; Janise M. Roh, MSW, MPH¹; Margarita Santiago-Torres, PhD¹; Hanjie Shen, MS¹; Dawn L. Hershman, MD, MS⁸; Lawrence H. Kushi, ScD⁴; Romain Neugebauer, PhD⁴; and Marilyn L. Kwan, PhD⁴

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original reports

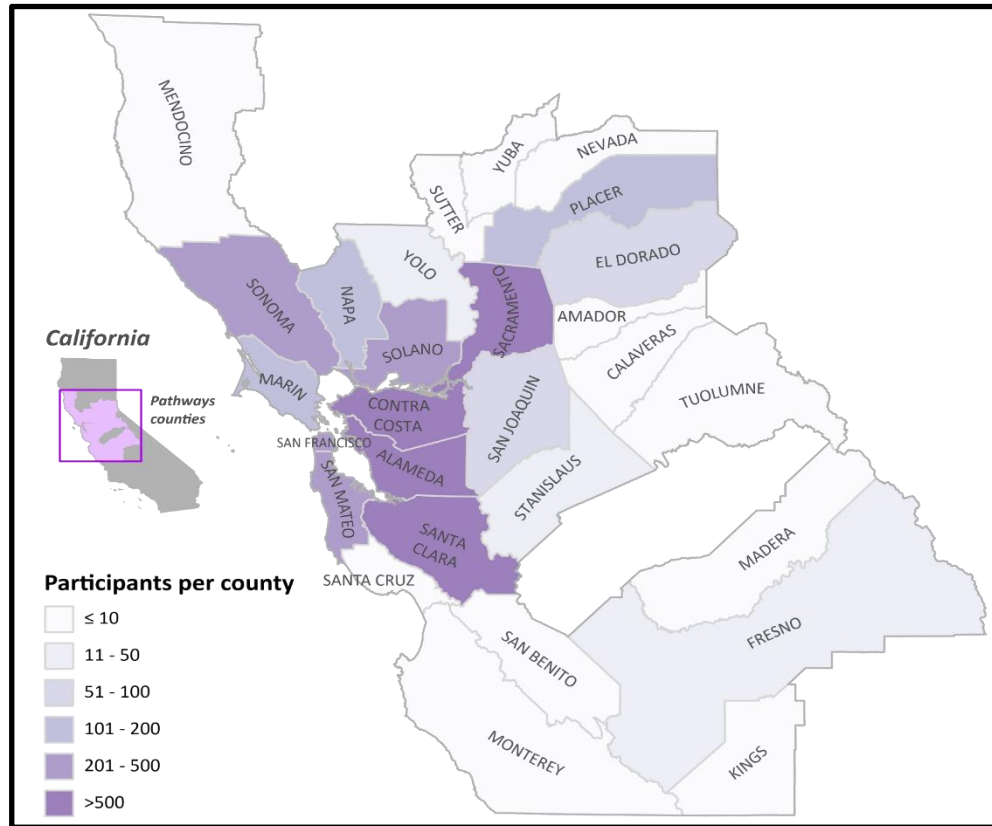
Risk of Cardiometabolic Risk Factors in Women With and Without a History of Breast Cancer: The Pathways Heart Study

Marilyn L. Kwan, PhD¹; Richard K. Cheng, MD, MSc^{2,3}; Carlos Iribarren, MD, MPH, PhD¹; Romain Neugebauer, PhD¹; Jamal S. Rana, MD, PhD^{1,4}; Mai Nguyen-Huynh, MD, MAS^{1,5}; Zaixing Shi, PhD^{6,7}; Cecile A. Laurent, MS¹; Valerie S. Lee, MHS¹; Janise M. Roh, MSW, MPH¹; Hanjie Shen, MS²; Eileen Rillamas-Sun, PhD, MPH⁷; Margarita Santiago-Torres, PhD⁷; Dawn L. Hershman, MD, MS⁸; Lawrence H. Kushi, ScD¹; and Heather Greenlee, ND, PhD, MPH^{2,3,7}

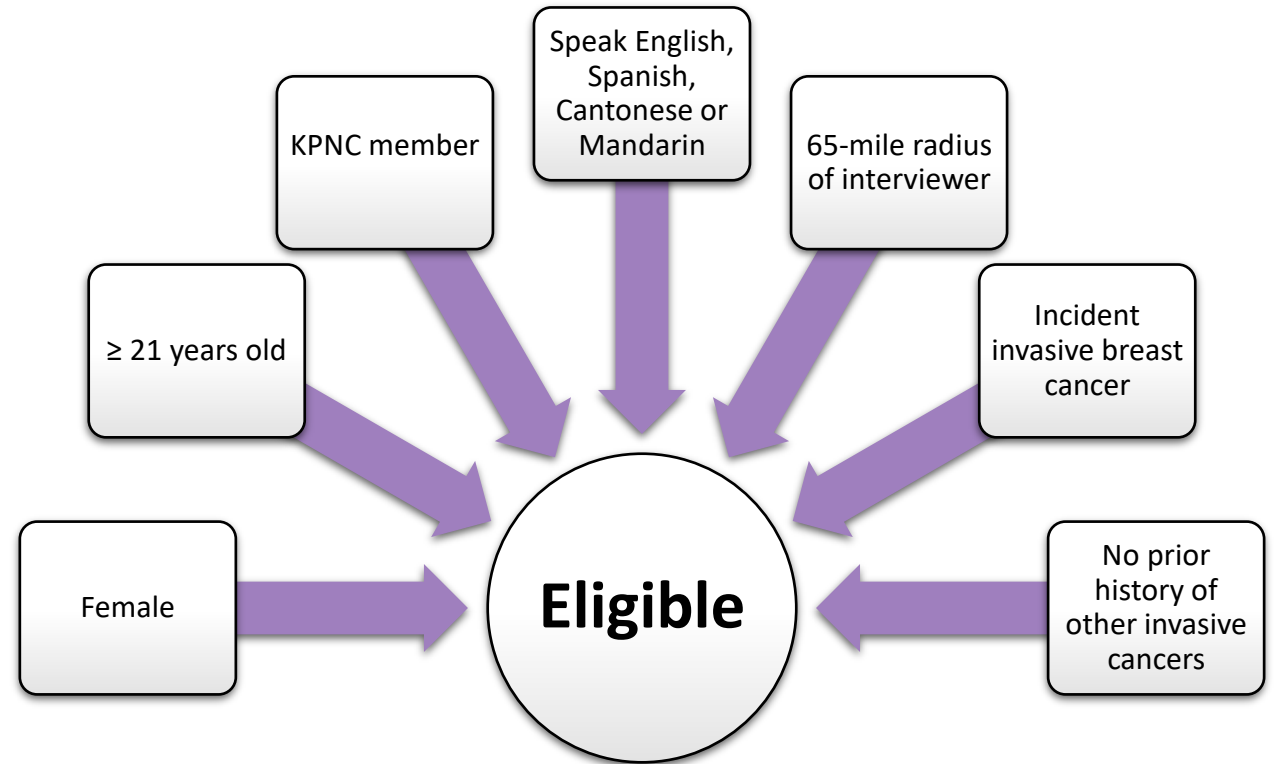
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Cardiotoxic treatments • Common risk factors

The Pathways Study is an ongoing prospective study of women diagnosed with invasive breast cancer at KPNC between 2005-2013

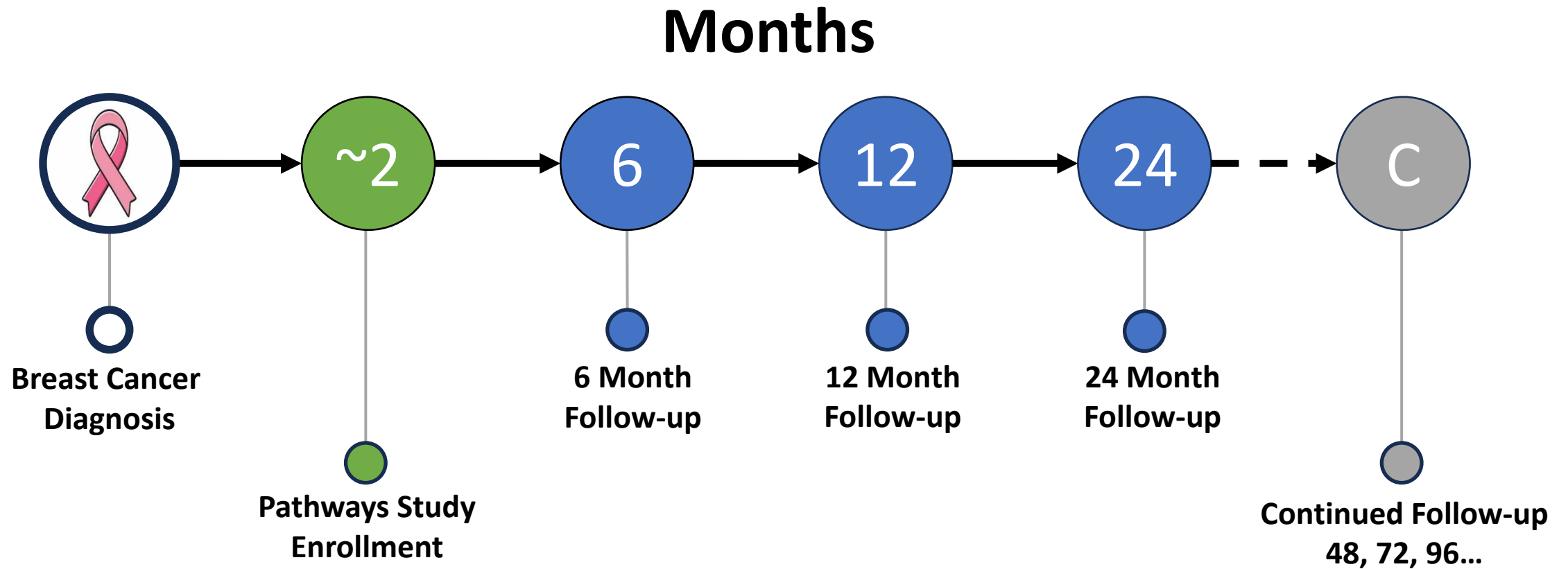


Geographic distribution of Pathways Study participants



Total enrolled = 4,504

Average time from diagnosis to enrollment was about 2 months and periodic follow-up is still ongoing



The Pathways Study's main objective is to...

To investigate and understand breast cancer **outcomes...**

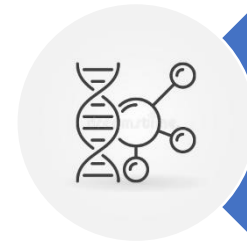
while focusing on...



Diet, physical activity and complementary alternative medicine

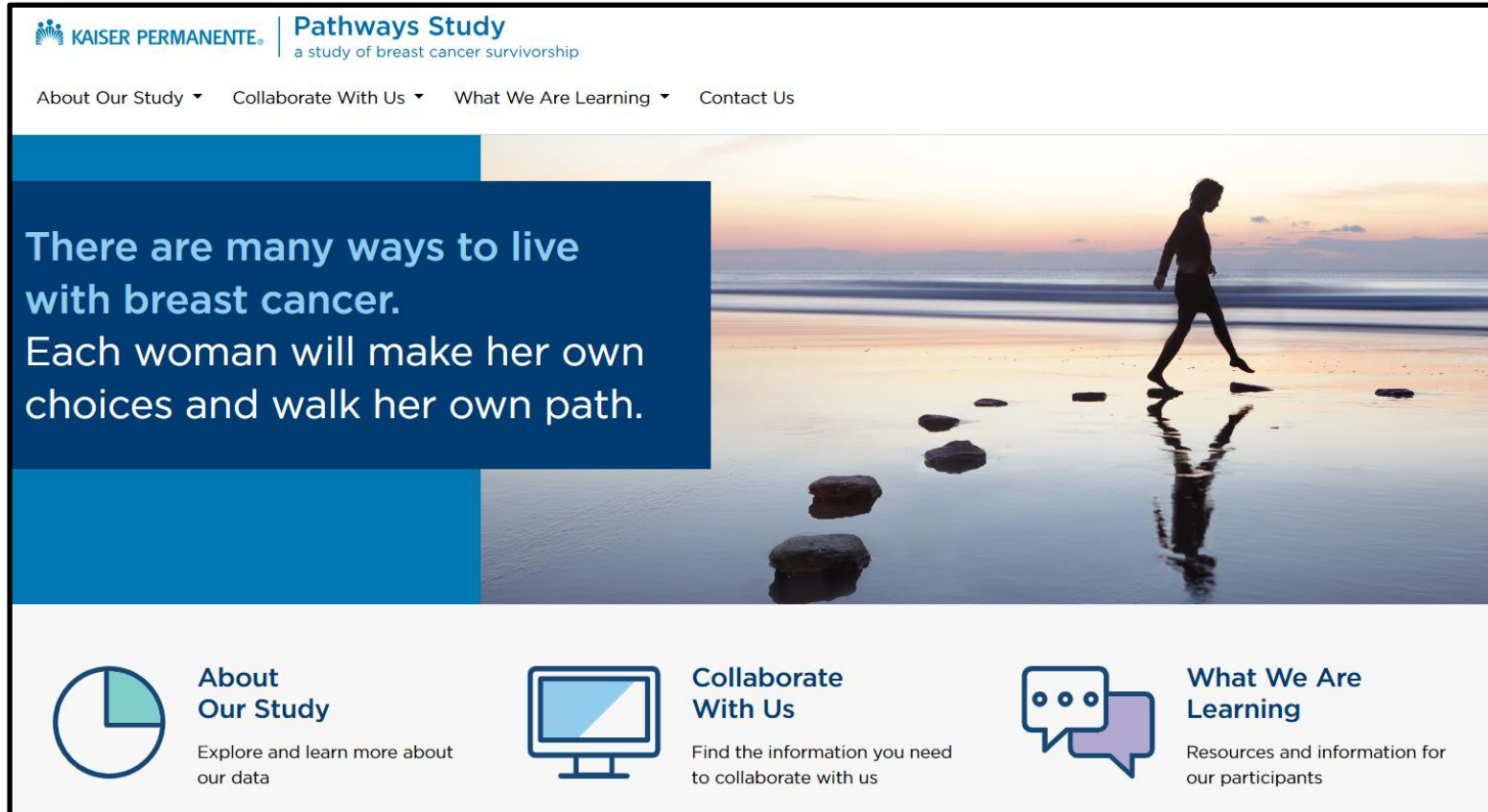


Social and built environment



Molecular and genetic factors

The new Pathways Study website is now live!



- Study Description**
- Data Visualizations**
- Data Center**
- News Stories**
- Webinars**
- Newsletters**
- Publications**
- And more...**

<https://thepathwaysstudy.org>

Is healthy eating associated with **cardiovascular** and **cardiometabolic** outcomes in women with breast cancer?



Healthy eating



Cardiovascular
and
cardiometabolic
outcomes

There are different ways in which we can study diet

Nutrients



Protein
Carbohydrates
Fats
Vitamins
Minerals

Food Groups



Meat
Dairy
Vegetables
Fruit
Nuts

Dietary Patterns



Vegetarian
Gluten-Free
Western
Plant-Based
Mediterranean

Dietary patterns are the quantities, proportions, variety or combination of different foods, drinks, and nutrients in diets, and the frequency with which they are consumed.

We can measure how similar someone's diet is to a dietary pattern by creating a scoring index

DASH Eating Plan	
The Benefits: Lowers blood pressure & LDL "bad" cholesterol.	
✔ Eat This	⚠ Limit This
Vegetables	Fatty meats
Fruits	
Whole grains	Full-fat dairy
Fat-free or low-fat dairy	
Fish	Sugar sweetened beverages
Poultry	
Beans	Sweets
Nuts & seeds	
Vegetable oils	Sodium intake

www.nhlbi.nih.gov/DASH

NIH National Heart, Lung, and Blood Institute

Encouraged Foods

■ Q1 = 1 point
 ■ Q2 = 2 points
 ■ Q3 = 3 points
 ■ Q4 = 4 points
 ▼ Q5 = 5 points

Discouraged Foods

Q1 = 5 points ▲
 Q2 = 4 points
 Q3 = 3 points
 Q4 = 2 points
 Q5 = 1 point ■

vegetables + ... + sodium = **DASH SCORE**

We developed and examined 5 diet quality indices (DQIs) concordant with healthy eating*



Dietary Approaches to Stop Hypertension (**DASH**)



American Cancer Society Nutrition Guidelines (**ACS**)



Healthy Plant-Based Dietary Index (**hPDI**)



Alternate Mediterranean Diet (**aMED**)



2020-2025 Health Eating Index (**HEI**)

***A higher score indicated greater concordance to the DQI, suggestive of higher diet quality.**

The 5 DQIs have some similarities and some differences

	DASH	hPDI	HEI	ACS	aMED
Max score	40	85	100	12	9
Encourages	Fruits Vegetables Whole grains Low-fat dairy Nuts/legumes	Whole fruits Non-starchy vegetables Whole grains Nuts Legumes Vegetable oils Teas/coffees	Fruits Vegetables Whole grains Greens/beans Dairy Fish/Seafood Unsaturated fats	Fruits(variety) Vegetables(variety) Whole grains	Fruits Vegetables Whole grains Legumes Nuts Fish/Seafood Unsaturated fats
Discourages	Red/processed meats Sodium Sweetened beverages	All animal products Fruit juices Starchy vegetables Refined grains Sweetened beverages Sweets\desserts	Refined grains Saturated fats Sodium Added sugar	Red/processed meats Sweetened beverages Processed foods Refined grains	Red/Processed meats

We looked at DQI associations with several incident (new cases) **cardiovascular** and **cardiometabolic** outcomes (n=3,415)

Cardiovascular Outcomes

	n	%
Ischemic heart disease	153	(4.5)
Heart failure	203	(5.9)
Cardiomyopathy	53	(1.6)
Stroke	114	(3.3)
Arrhythmia	370	(10.8)
Cardiac arrest	98	(2.9)
Valvular heart disease	98	(2.9)
Venous thromboembolic disease	182	(5.3)

Cardiometabolic Outcomes

	n	%
Hypertension	465	(13.6)
Diabetes	348	(10.2)
Dyslipidemia	583	(17.1)

We took into consideration several other risk factors that could affect the results

- Age at BC diagnosis
- Race and ethnicity
- Education attainment
- Menopausal status
- Physical activity
- Smoking status
- Total energy intake
- Alcohol intake
- Health plan utilization
- Comorbidity score
- Tumor characteristics
- Prior cardiometabolic events
- Prior cardiovascular events

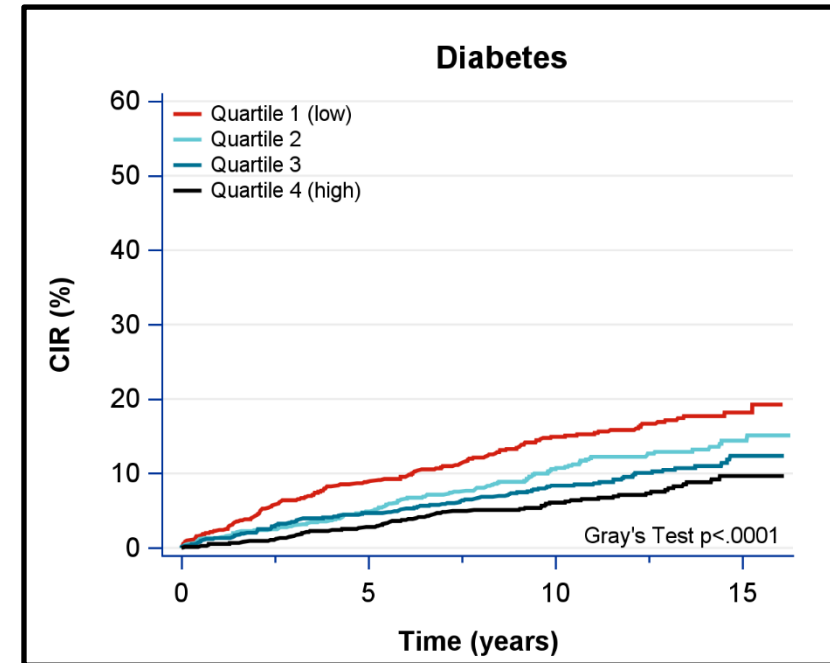
We found that healthier diets at or around the time of diagnosis were associated with a 25-50% lower risk of...

- **Heart failure**
- **Arrhythmia**
- **Cardiac arrest**
- **Valvular heart disease**
- **Venous thromboembolic disease**

Diets most aligned with DASH showed the strongest associations with cardiovascular outcomes

We also found that healthier diets at or around the time of diagnosis were associated with a 30-40% lower risk of...

- Hypertension
- Diabetes
- Dyslipidemia



Diets most aligned with HEI showed the strongest associations with cardiometabolic outcomes

Key takeaways from this study are...

1. In general, healthier diets at BC diagnosis were associated with 25-50% lower risk of **cardiovascular** and **cardiometabolic** outcomes.
2. DASH and HEI appeared to provide the most benefit.

All 5 DQIs have several **encouraged** foods in common



Fruits



Vegetables



Whole grains



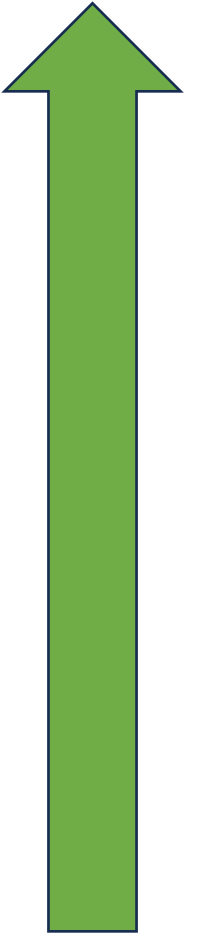
Nuts



Legumes



Low-fat dairy
(DASH/HEI only)



All 5 DQIs have some **discouraged** foods in common



Red meats



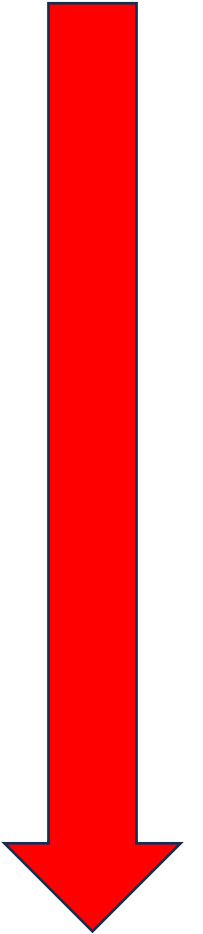
Processed meats



Added sugar



Sodium
(DASH/HEI only)



Where do we go from here?

- 1. Diet quality assessment** should be encouraged as part of the standard clinical intake process at the time of breast cancer diagnosis.
- 2. Diet monitoring and quality improvement** over the course of the breast cancer survivorship period should also be encouraged.

