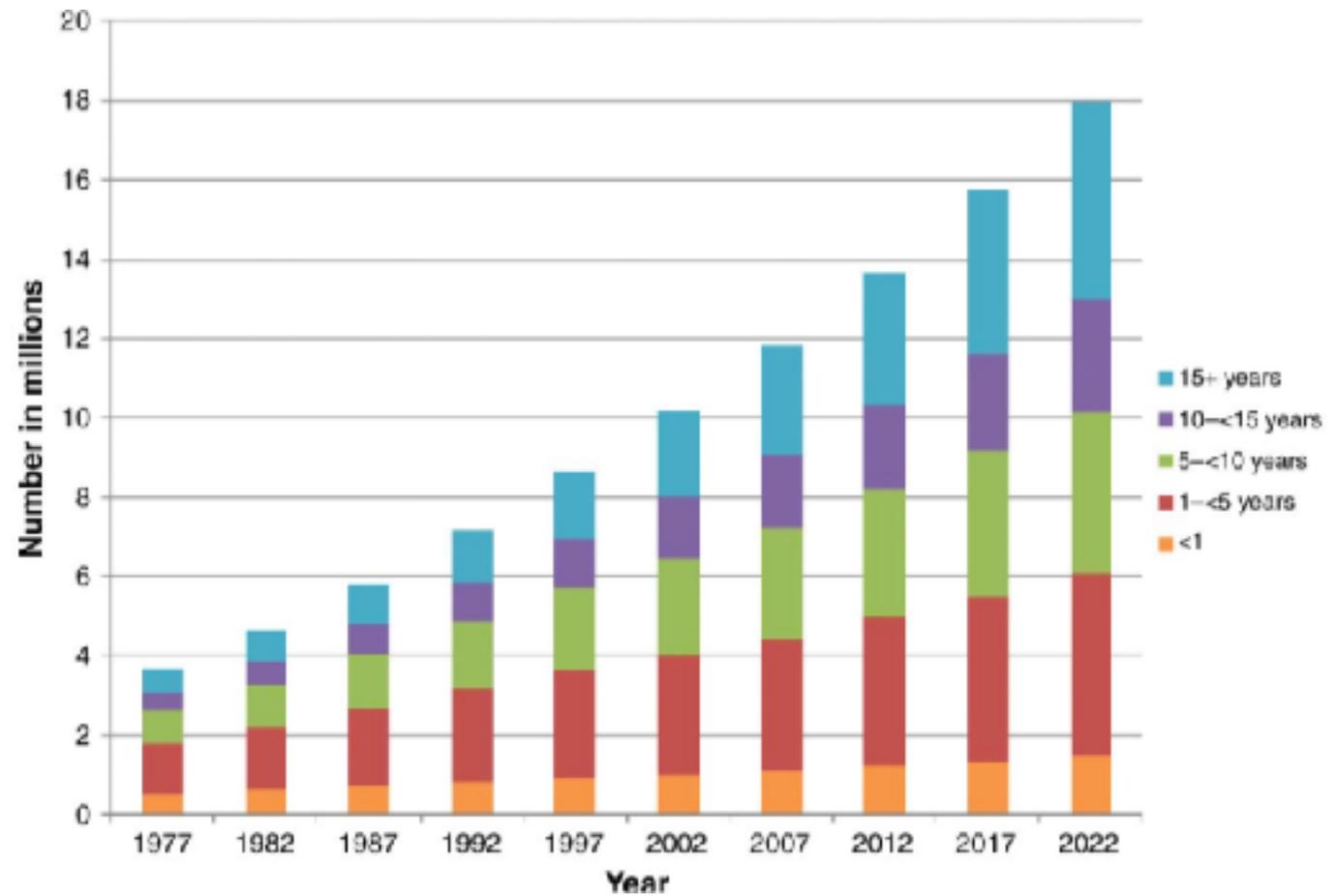


WHY ADDRESSING OBESITY AND LIFESTYLE IN CANCER SURVIVORS MATTERS

Melinda Stolley, PhD
Professor, Department of Medicine
Associate Director of Cancer Prevention and Control

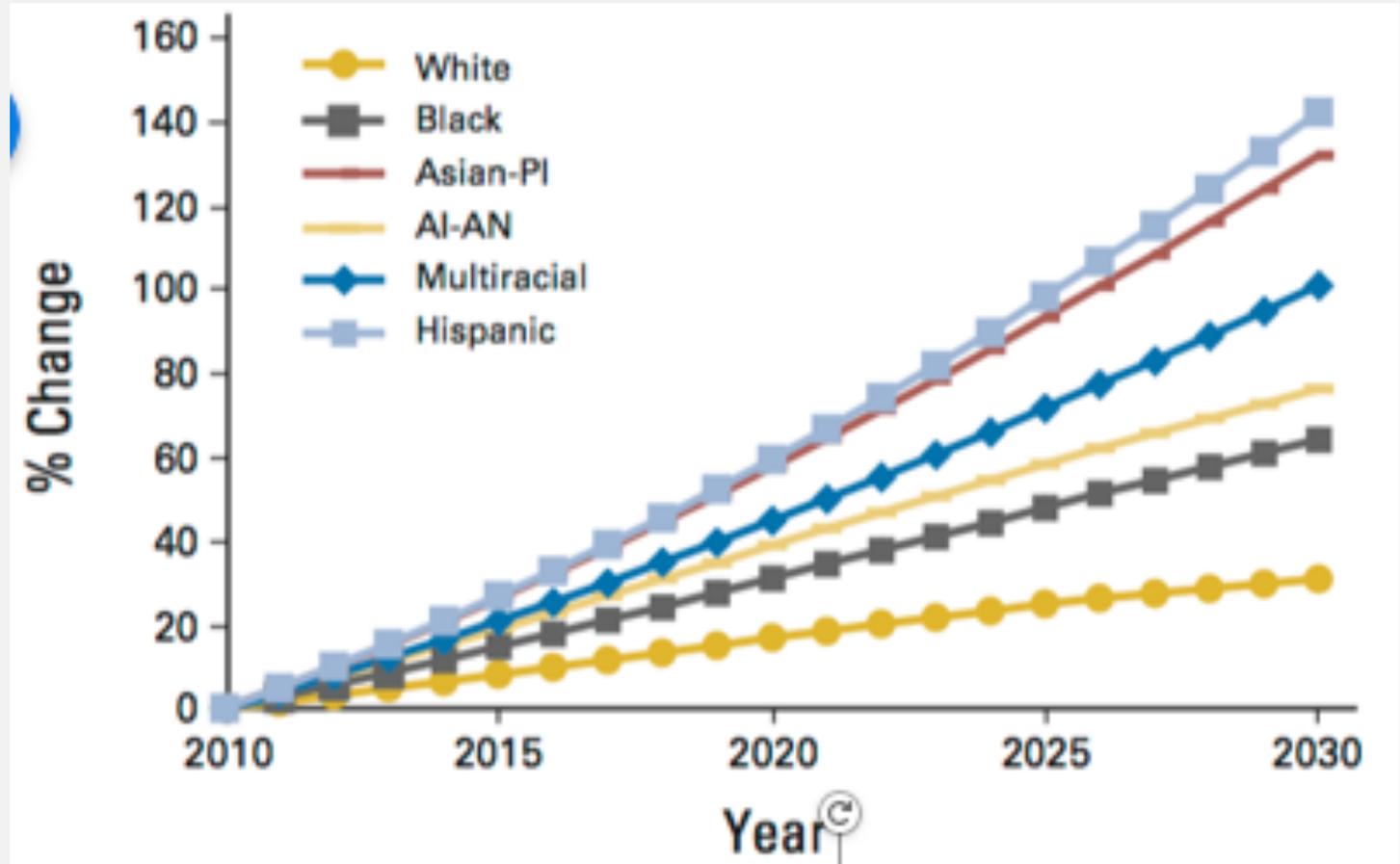
16.9 MILLION
SURVIVORS
2019

20.3 MILLION
EXPECTED
BY 2026



PROJECTED INVASIVE CANCER INCIDENCE 2010-2030

- 142% increase among Hispanics
- 60% increase among African Americans

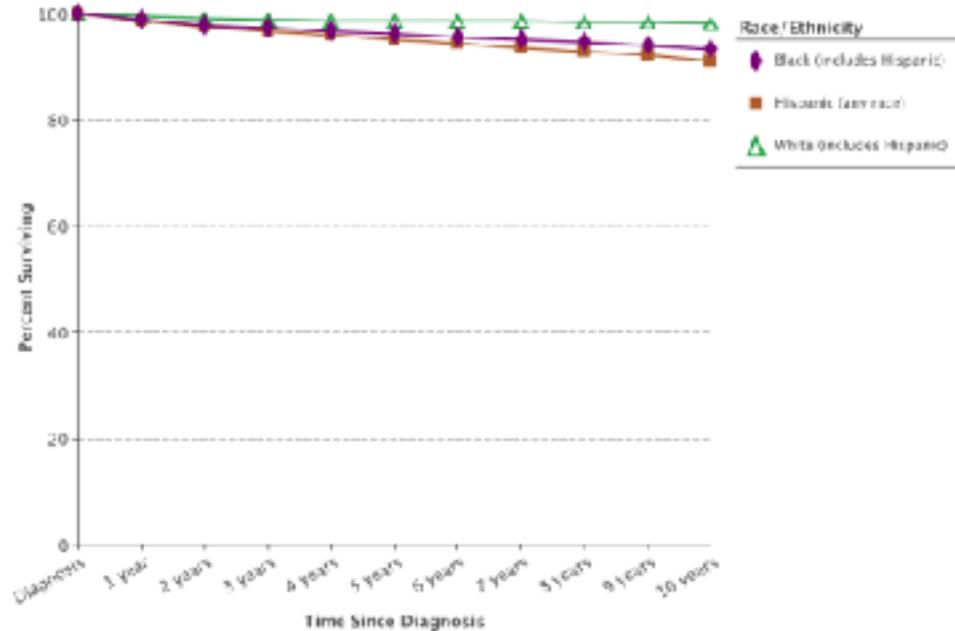


	Black	Hisp	White
5-YR	96.1	95.1	98.7
10-YR	93.2	91.2	98.3

(Per 100,000)

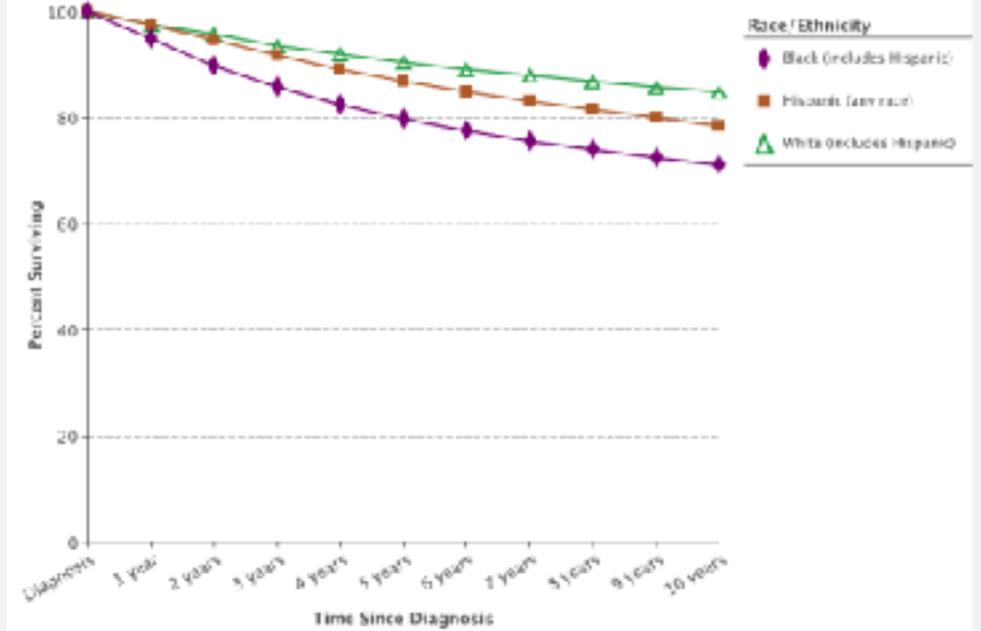
	Black	Hisp	White
5-YR	79.7	87.0	90.5
10-YR	71.1	78.4	84.9

Prostate Cancer
SEER Survival Rates by Time Since Diagnosis, 2000–2015
By Race/Ethnicity
All Ages, All Stages



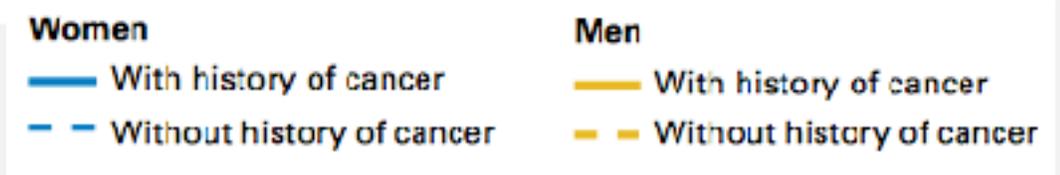
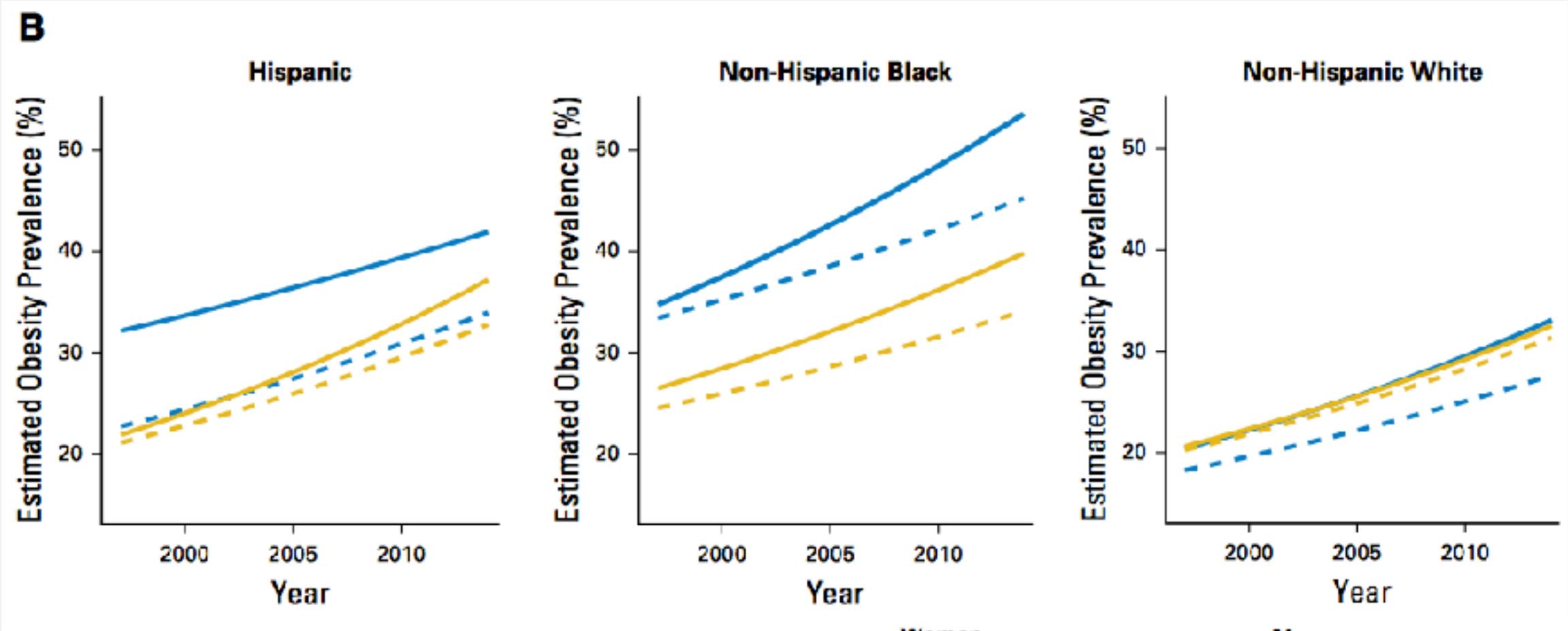
SEER 18 areas (<http://seer.cancer.gov/results/totals/>) San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJ/WLA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL, GA.
The relative survival rates are calculated using monthly intervals.
The Expected Survival - Life Tables (<https://seer.cancer.gov/exp-survival/>) by Socio-Economic Standards were used.
Rates for American Indians/Alaska Natives only include cases that are in a Purchased/Referred Care Delivery Area (PRCA). See SEER Rare Remote Documentation for American Indian/Alaska Native Statistics (http://seer.cancer.gov/seerremotevariables/jswr/rare_ethnicity/Pa-2a).
Hispanics and Non-Hispanics are not mutually exclusive from whites, blacks, Asian/Pacific Islanders, and American Indians/Alaska Natives. Incidence data for Hispanics and Non-Hispanics are based on the NAACCR Hispanic/Latino Identification Algorithm (NHIA) and exclude cases from the Alaska Native Registry. See SEER Rare Remote Documentation for Spanish-Hispanic/Latino Priority (http://seer.cancer.gov/seerremotevariables/jswr/race_ethnicity/WHispanic).
See http://seer.cancer.gov/explorer/cancer_sites.htm#SEER-Explorer-Cancer-Site-Definitions for details about the coding used for SEER incidence data.
Created by seer.cancer.gov/explorer/explorer.php on 04/19/2019 5:58 pm.

Breast Cancer
SEER Survival Rates by Time Since Diagnosis, 2000–2015
By Race/Ethnicity
Female, All Ages, All Stages

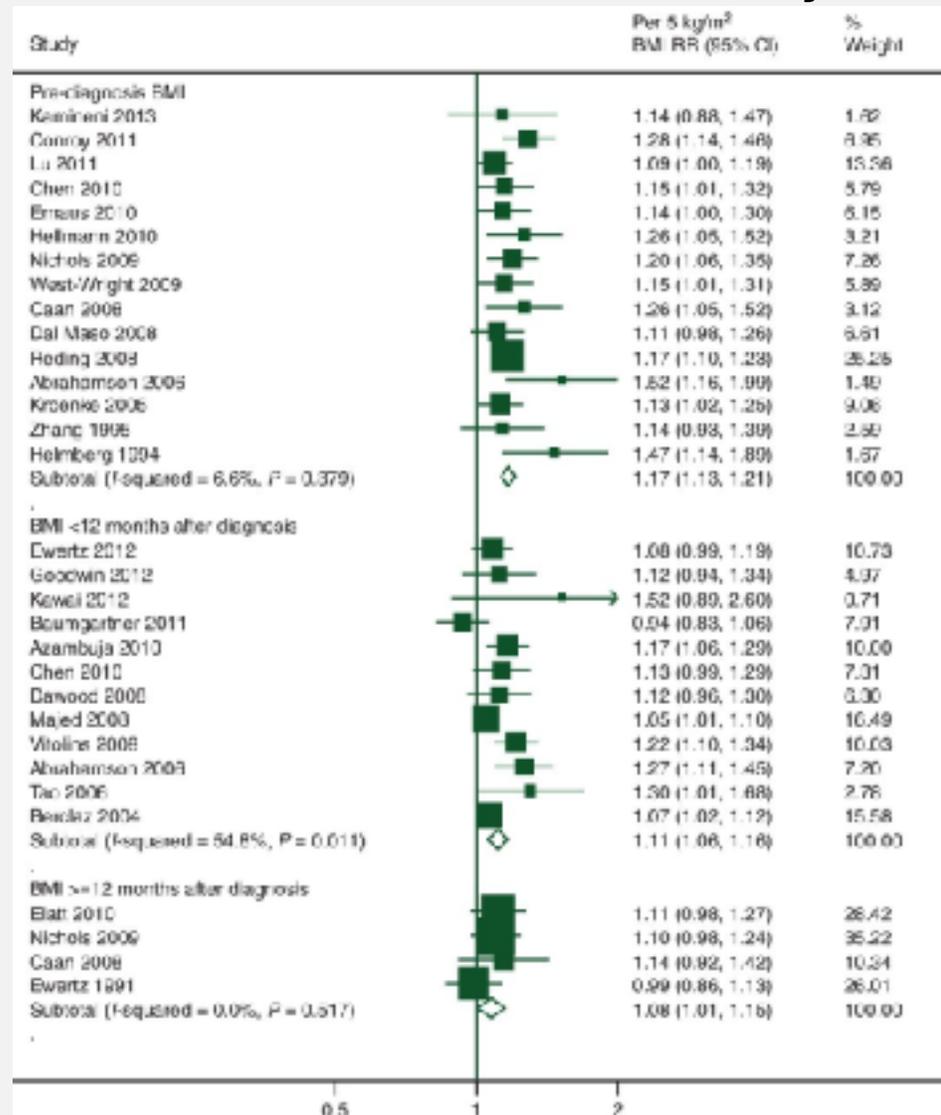


SEER 18 areas (<http://seer.cancer.gov/results/totals/>) San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJ/WLA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL, GA.
The relative survival rates are calculated using monthly intervals.
The Expected Survival - Life Tables (<https://seer.cancer.gov/exp-survival/>) by Socio-Economic Standards were used.
Rates for American Indians/Alaska Natives only include cases that are in a Purchased/Referred Care Delivery Area (PRCA). See SEER Rare Remote Documentation for American Indian/Alaska Native Statistics (http://seer.cancer.gov/seerremotevariables/jswr/rare_ethnicity/Pa-2a).
Hispanics and Non-Hispanics are not mutually exclusive from whites, blacks, Asian/Pacific Islanders, and American Indians/Alaska Natives. Incidence data for Hispanics and Non-Hispanics are based on the NAACCR Hispanic/Latino Identification Algorithm (NHIA) and exclude cases from the Alaska Native Registry. See SEER Rare Remote Documentation for Spanish-Hispanic/Latino Priority (http://seer.cancer.gov/seerremotevariables/jswr/race_ethnicity/WHispanic).
See http://seer.cancer.gov/explorer/cancer_sites.htm#SEER-Explorer-Cancer-Site-Definitions for details about the coding used for SEER incidence data.
Created by seer.cancer.gov/explorer/explorer.php on 04/19/2019 5:47 pm.

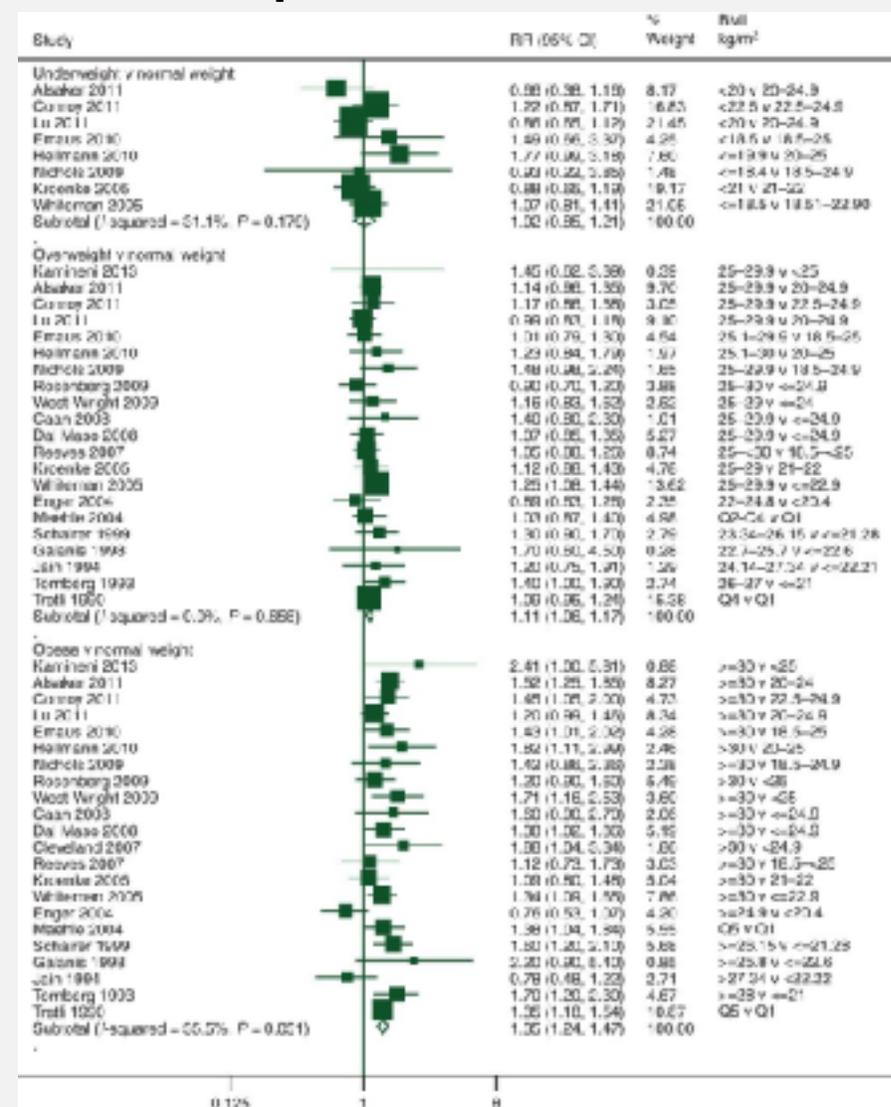
TRENDS IN OBESITY PREVALENCE IN ADULTS WITH CANCER (1997-2014)



Body mass index and survival in women with breast cancer – systematic literature review and meta-analysis of 82 follow-up studies



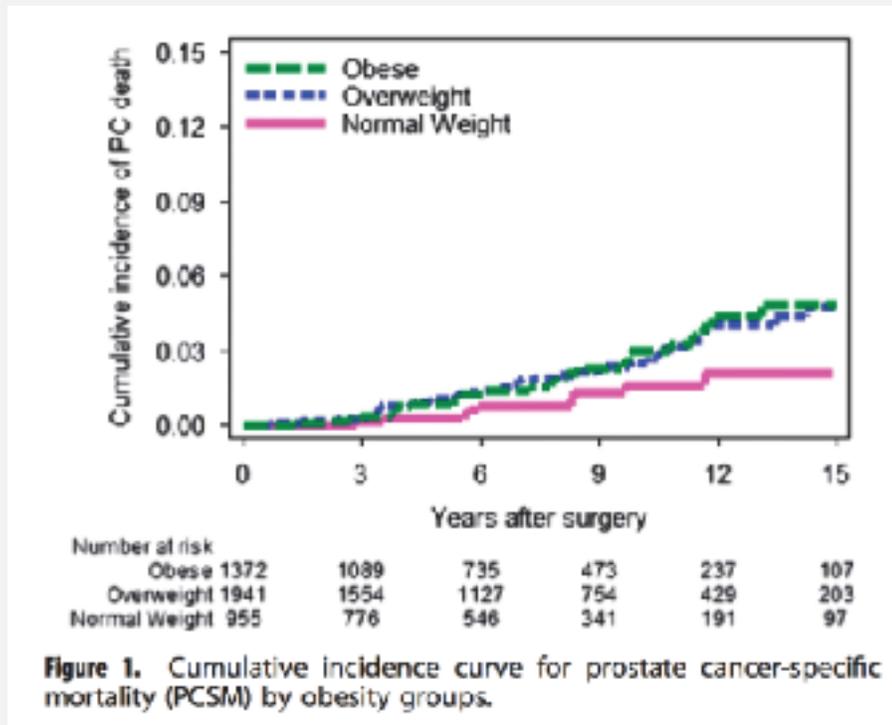
All cause mortality



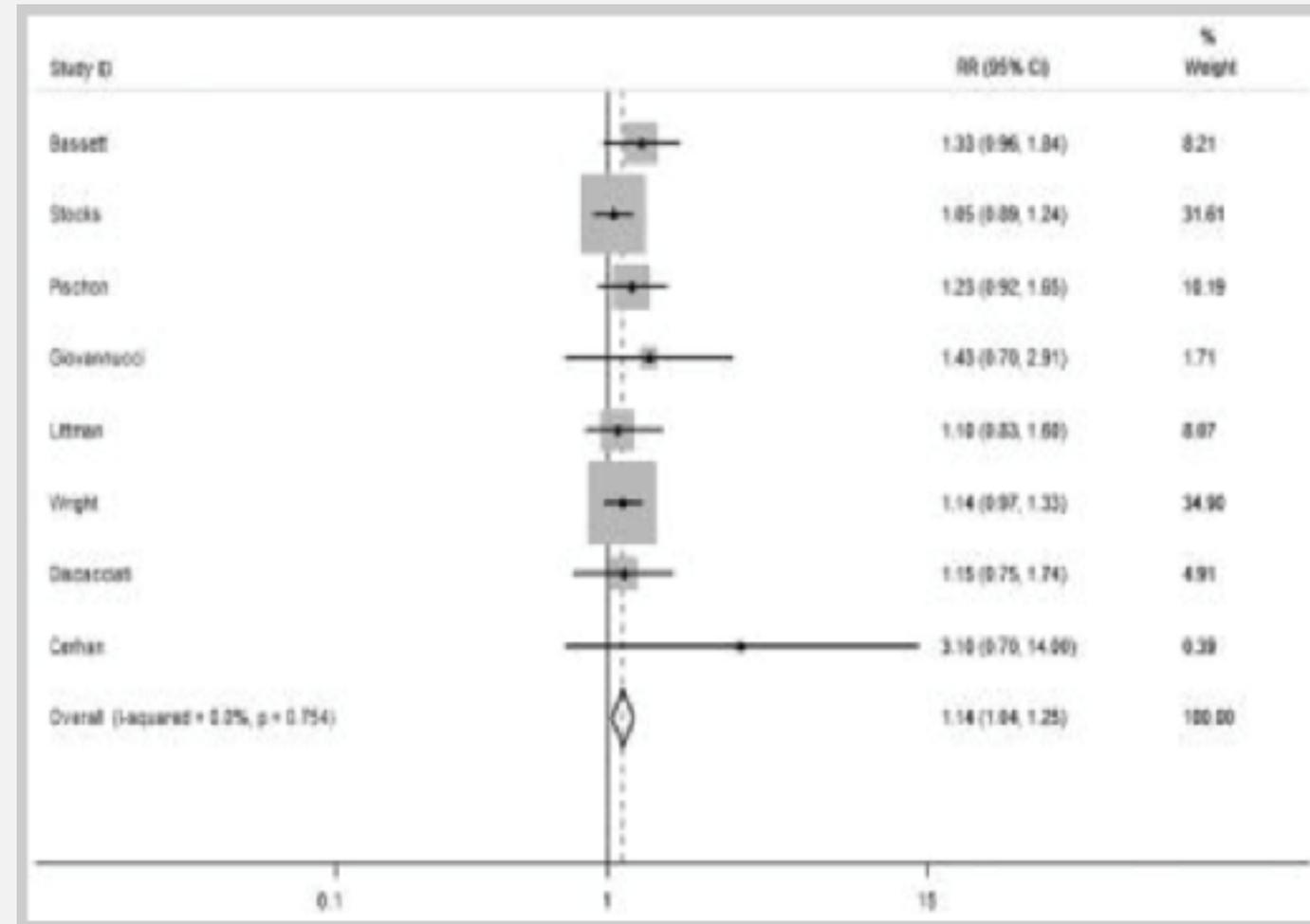
BC specific mortality

OBESITY AND PROSTATE CANCER MORTALITY

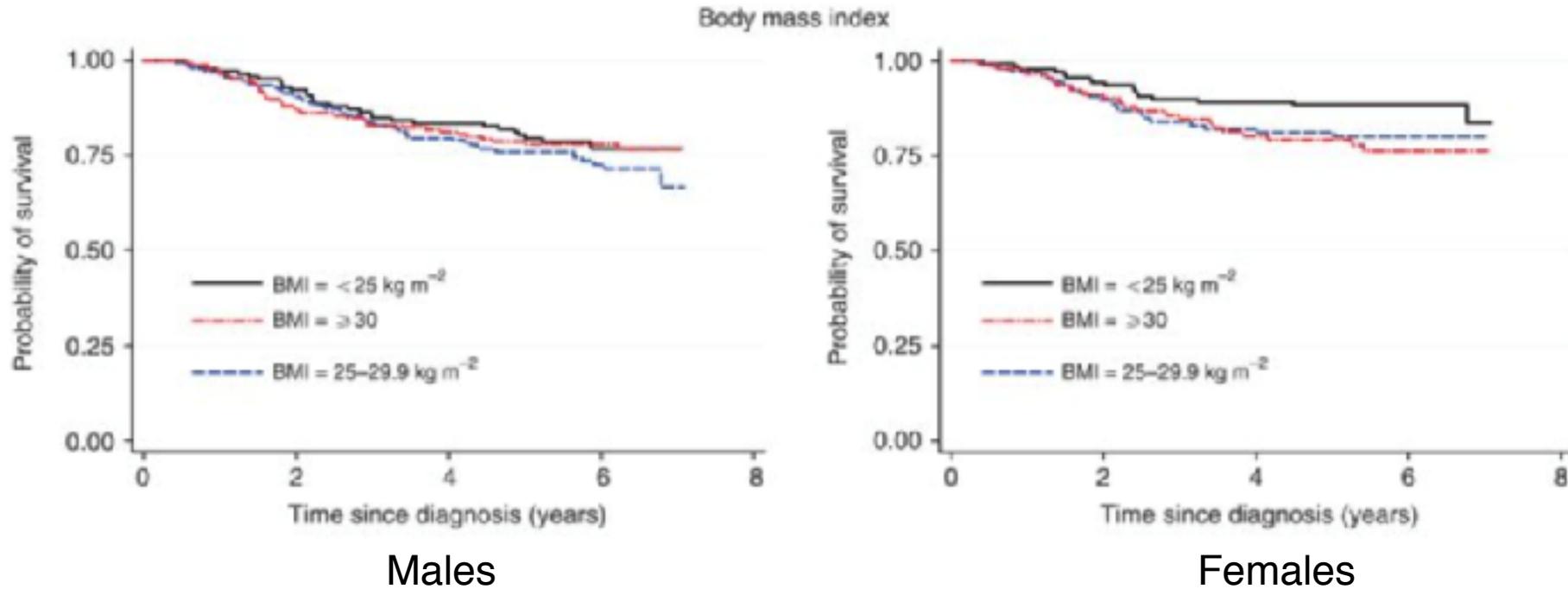
Shared Equal Access Regional Cancer Hospital (SEARCH) database (n= 4268)



Vidal AC et al., Prostate Cancer and Prostatic Diseases (2017) 20, 72–78



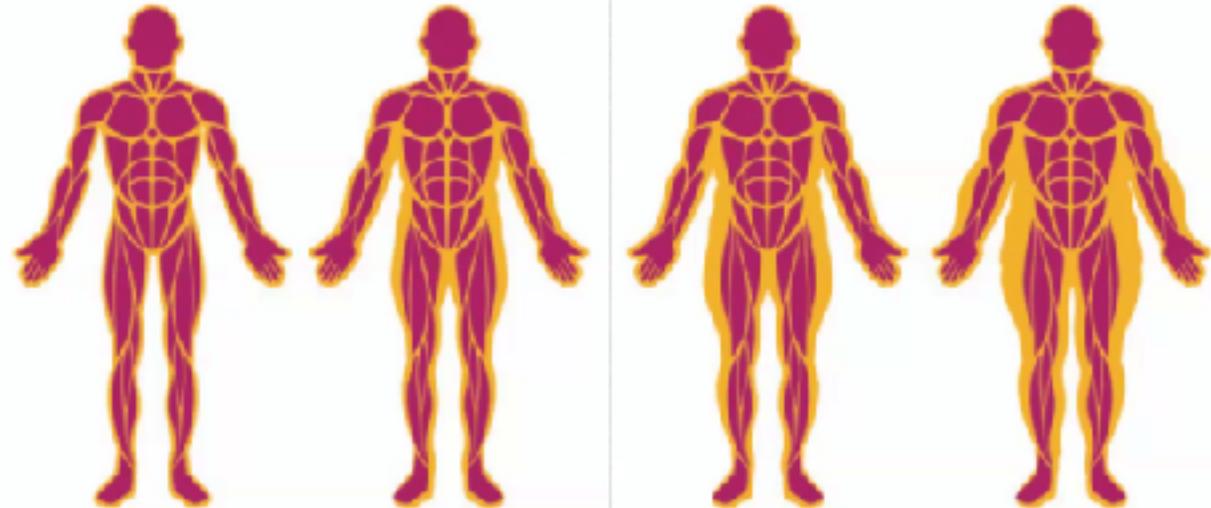
Zhang X, Oncology Letters, 2015 Mar; 9(3): 1307–1312



OBESITY AND COLON CANCER SURVIVAL

IT'S NOT ALL ABOUT
THE NUMBER ON THE
SCALE...

Low muscle mass is hidden behind
the bulk of body weight



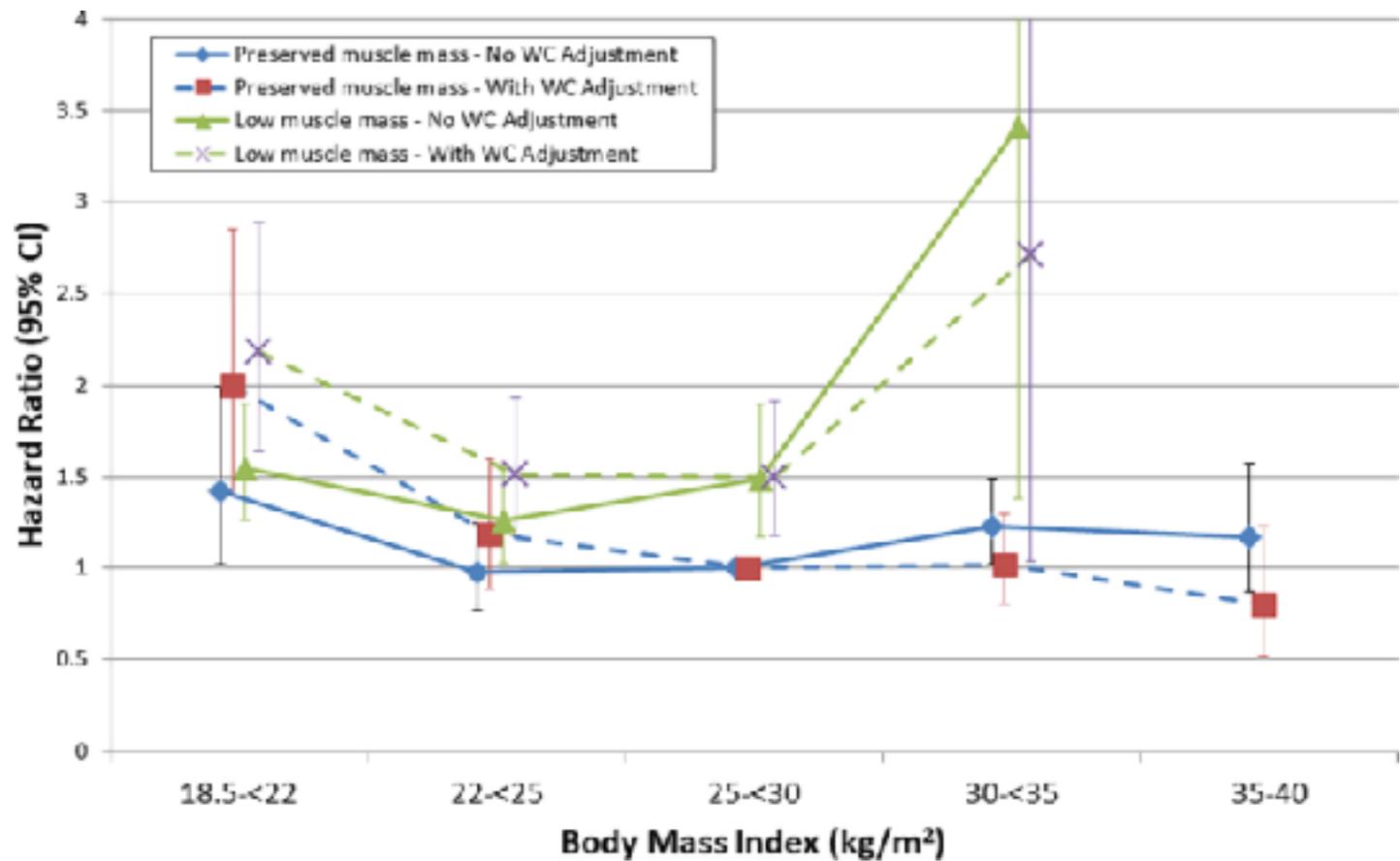
Underweight with low
muscle mass

Normal weight with
low muscle mass

Obese with low
muscle mass

Morbid obese with low
muscle mass

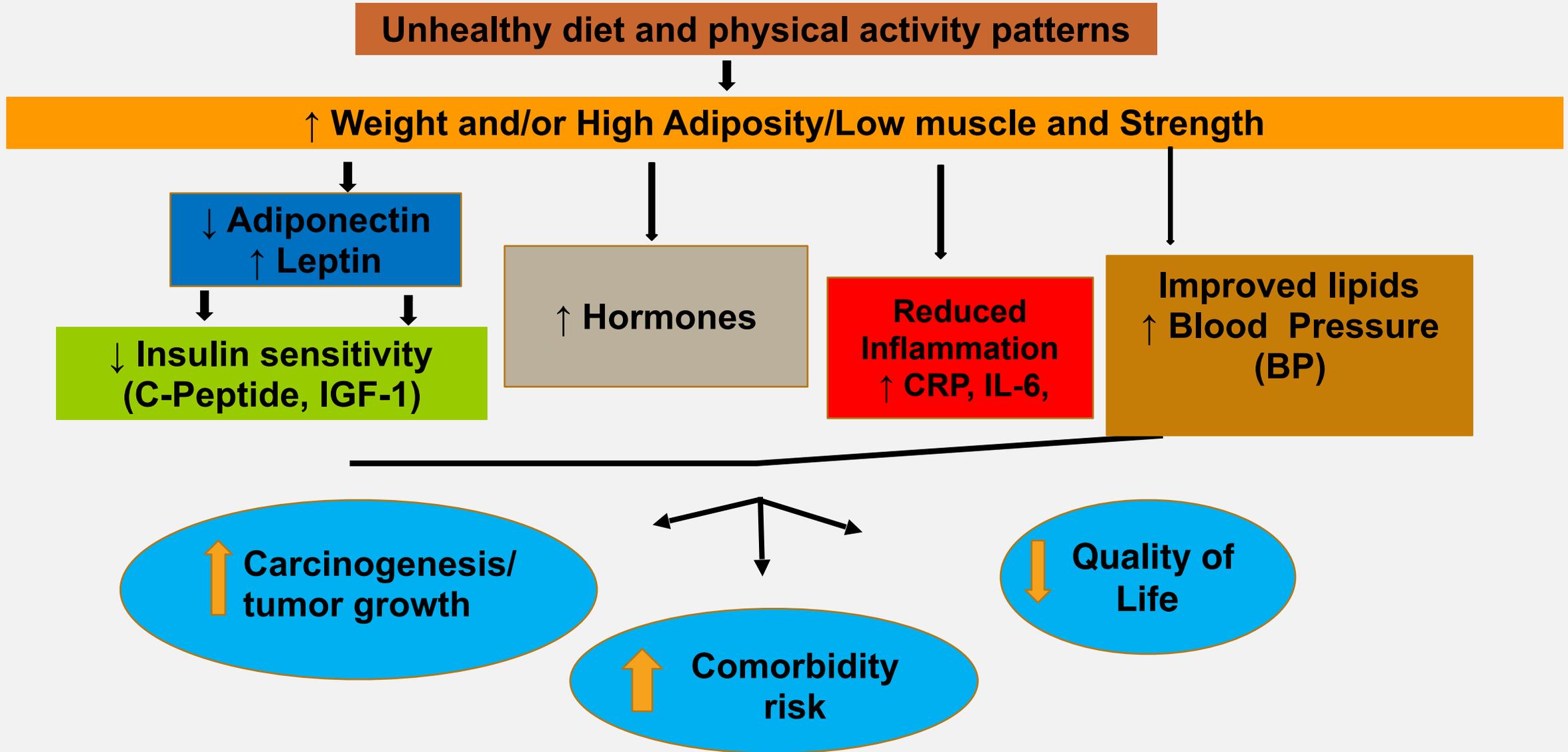
MUSCLE MATTERS



MUSCLE, FAT, LIFESTYLE AND CANCER SURVIVORS

- Fatigue and reduced physical functioning - commonly experienced long-term effects
- Survivors often become deconditioned and lose muscle mass during treatment leading to declines in physical functioning
- Muscle loss is not always apparent from monitoring weight - even when weight is stable, survivors can be replacing muscle mass with fat mass (sarcopenic obesity) – weight gain exacerbates negative effects of muscle loss
- Weight loss not necessarily the answer- weight loss without exercise and adequate dietary protein can contribute to further muscle loss
- Cancer survivors with sarcopenic obesity - those with high body fat and low muscle mass – at highest risk for mortality
- Physical activity, high diet quality, and weight management may ameliorate many of the problems
- Substantial evidence supports the benefits of physical activity, diet, and weight management interventions - cancer-related symptoms, improved quality of life, functional health outcomes

Biological Framework



ACS Guidelines on Nutrition and Physical Activity for Cancer Survivors

Get to and stay at a healthy weight.

- If you are overweight or obese, limit how much you eat of high-calorie foods and beverages and increase physical activity to promote weight loss.

Be active.

- Avoid inactivity and return to normal daily activities as soon as possible after diagnosis.
- Aim to exercise at least 150 minutes per week.
- Include strength training exercises at least 2 days per week.

Eat a variety of healthy foods from plant sources.

- Limit the amount of processed meat and red meat you eat.
- Eat 2½ cups or more of vegetables and fruits each day.
- Choose whole grains rather than refined grain products.

BEHAVIORS, COMORBIDITIES, QUALITY OF LIFE AND SURVIVORS FROM UNDERREPRESENTED MINORITY SURVIVORS

- Low adherence to nutrition and physical activity guidelines
- High rates of obesity-related comorbidities
- More likely to report fair-poor health status compared to minority controls and other survivors



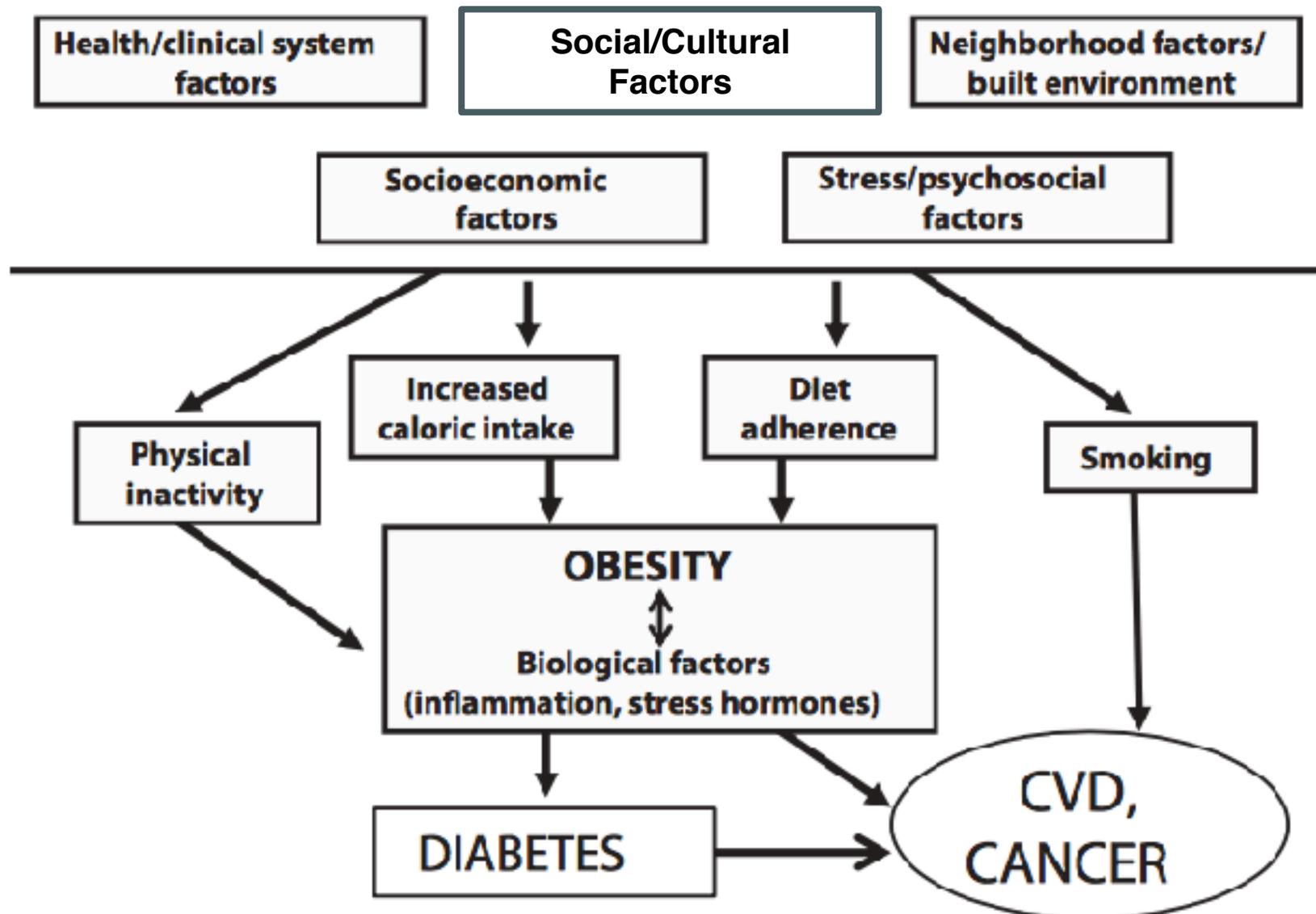
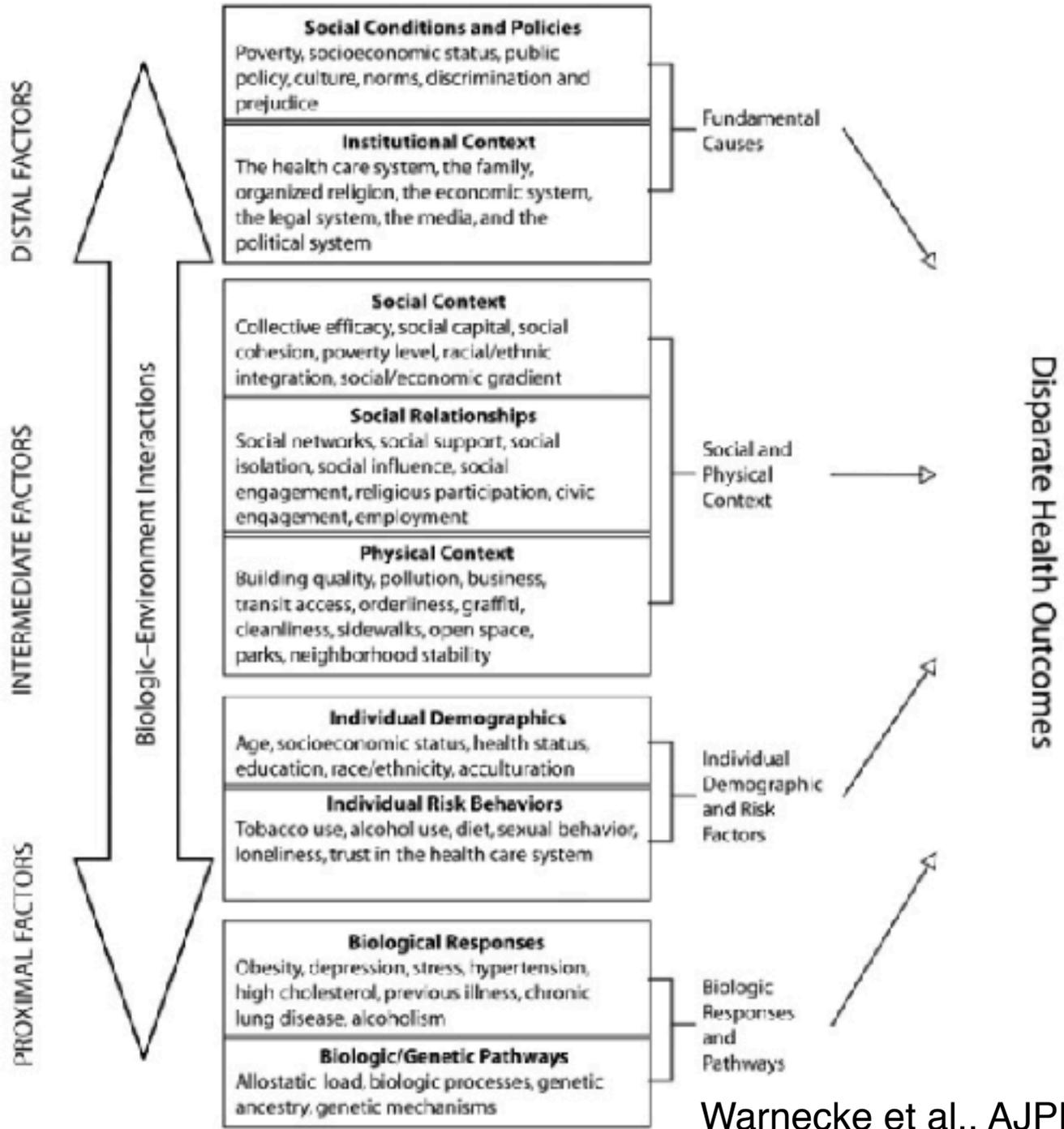


FIGURE 1—Effect of biological, behavioral, clinical, and nonclinical factors on disease pathways in cardiovascular disease (CVD) and cancer: Transdisciplinary Cardiovascular and Cancer Health Disparities Training.

DEVELOPING LIFESTYLE PROGRAMS
WITH SURVIVORS FROM
UNDERREPRESENTED GROUPS



Framework for Research Agenda: Biopsychosocial framework to address cancer disparities and obesity that integrates biological, behavioral and community based research.



Warnecke et al., AJPH

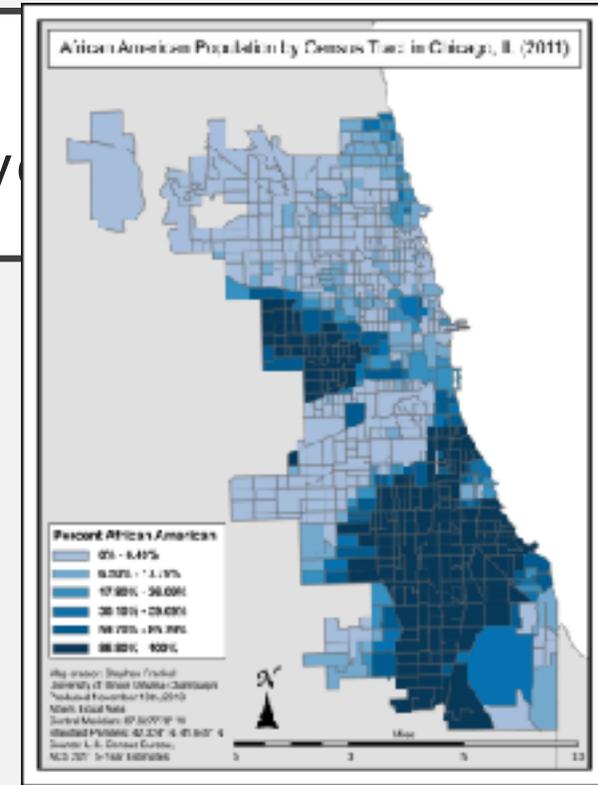
STRATEGIES FOR ENHANCING CULTURAL APPROPRIATENESS

- **Peripheral:** give programs or materials the appearance of cultural appropriateness (i.e., logo, recruitment materials, exercise session music)
- **Evidential:** enhance the perceived relevance of a health issue for a given group by presenting evidence of its impact on that group (i.e., prostate cancer disparities, impact of obesity, comorbidities in the AA community)
- **Linguistic:** make health education programs and materials more accessible by providing them in the dominant or native language of target group
- **Constituent-Involving:** draw directly on the experiences of the target group (i.e., hire staff who represent target group; inform intervention using qualitative data from target group; have advisory group to provide feedback on study materials and procedures)
- **Sociocultural:** discuss health-related issues in the context of broader social and/or cultural values (i.e., honoring woman's central role in families, cancer fatalism and stigma, machismo or the central role of masculinity, body image ideals, and the traditional roles of food)



MOVING FORWARD

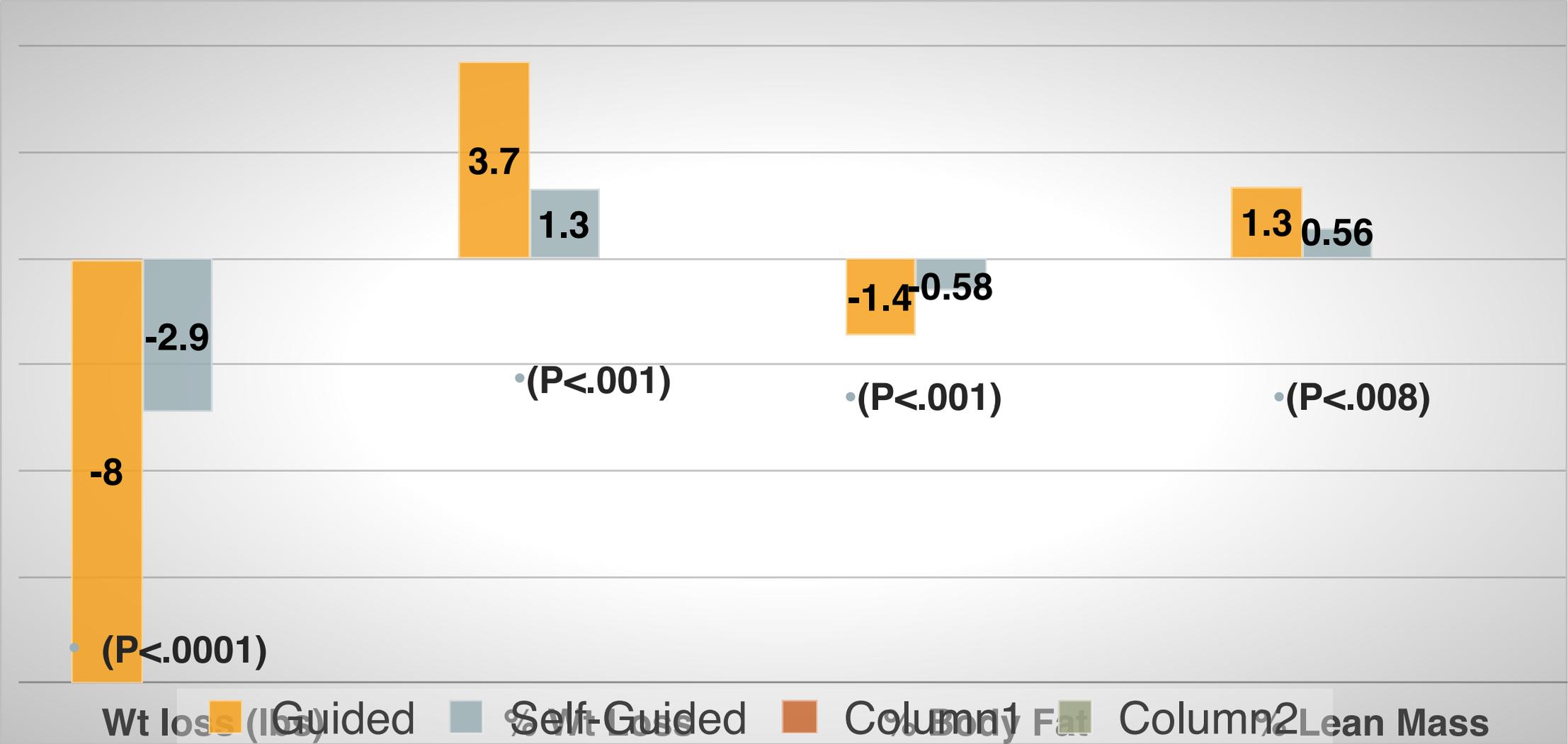
N= 246 African American Breast Cancer Survivors



- 6-month weight loss intervention
 - Guided: 2x weekly meetings with supervised exercise, 2x weekly text messaging
 - Program binder, Newsletter
 - Self-Guided: Program Binder, Monthly calls, Newsletter
- Primary outcome: weight loss
- Secondary outcomes: behavior, biomarkers, quality of life
- 6-month retention – 86%: 12-month intervention – 84%



ANTHROPOMETRICS



DIET

Caloric Intake: (p<0.03)

- Guided: -563.9 (72.6)
- Self-Guided: -226.2 (75.8)

% Calories from Fat: (ns)

- Guided: 22.19 (0.74)
- Self-Guided: 20.67 (0.77)

Fiber (g/1000kcal) (p<0.001)

- Guided: 3.24 (0.33)
- Self-Guided: 0.91 (0.35)

Added Sugars (tsps./day) p= 0.03

- Guided: -6.98 (1.02)
- Self-Guided: -3.85 (1.06)

**PHYSICAL
ACTIVITY**

Moderate Activity: ns

Guided:

+98.4 (0.42) mins/day

Self-Guided:

+60.6 (0.44)

mins/day

Vigorous Activity: (p=0.03)

Guided:

+17.4 (0.08) mins/day

Self-Guided:

+ 2.4 (0.08)

mins/day

BIOMARKER RESULTS

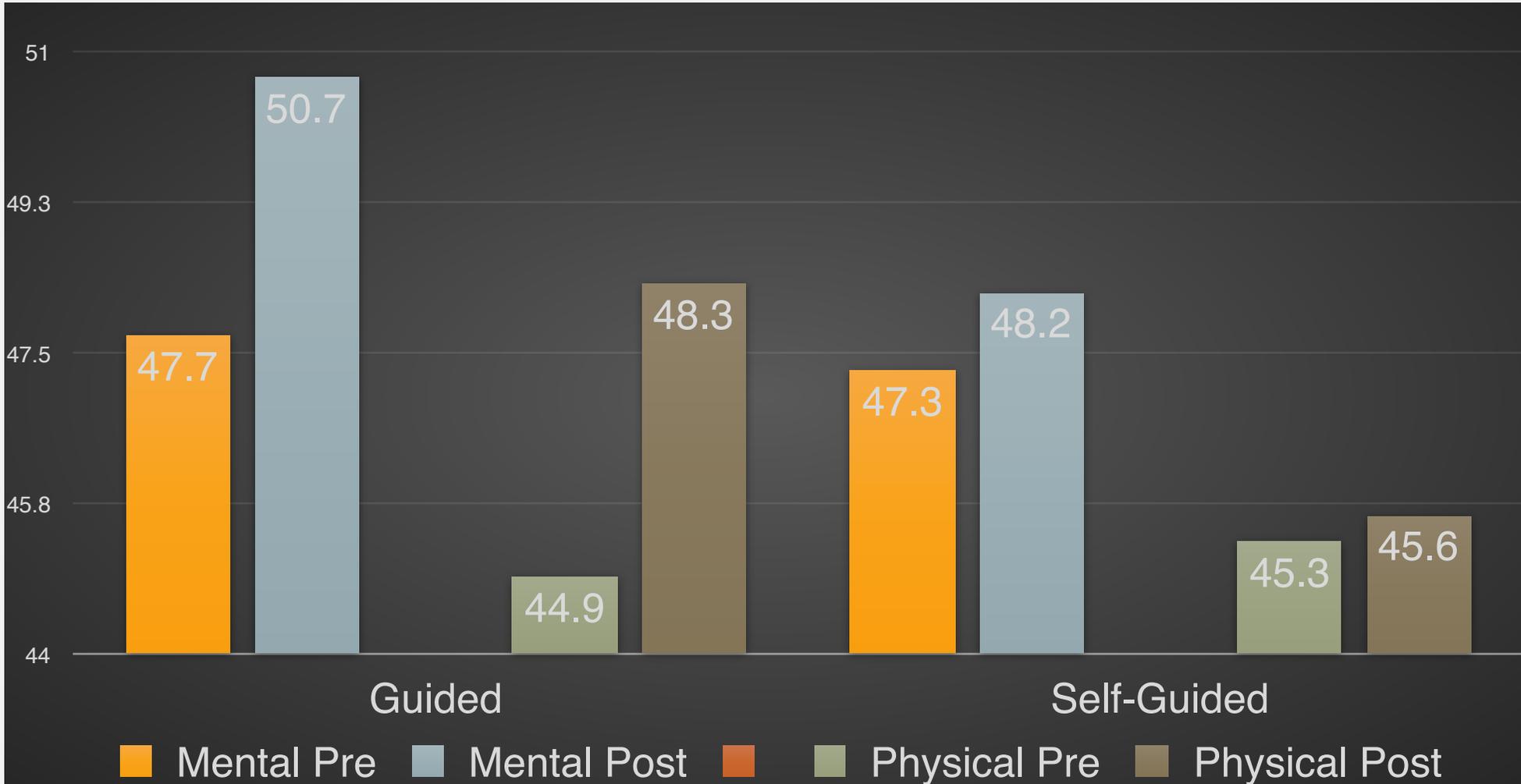
Between Groups Post-Intervention:

- Triglycerides (p < 0.02)
- Leptin (p < 0.008)
- C-Peptide (p < 0.008)

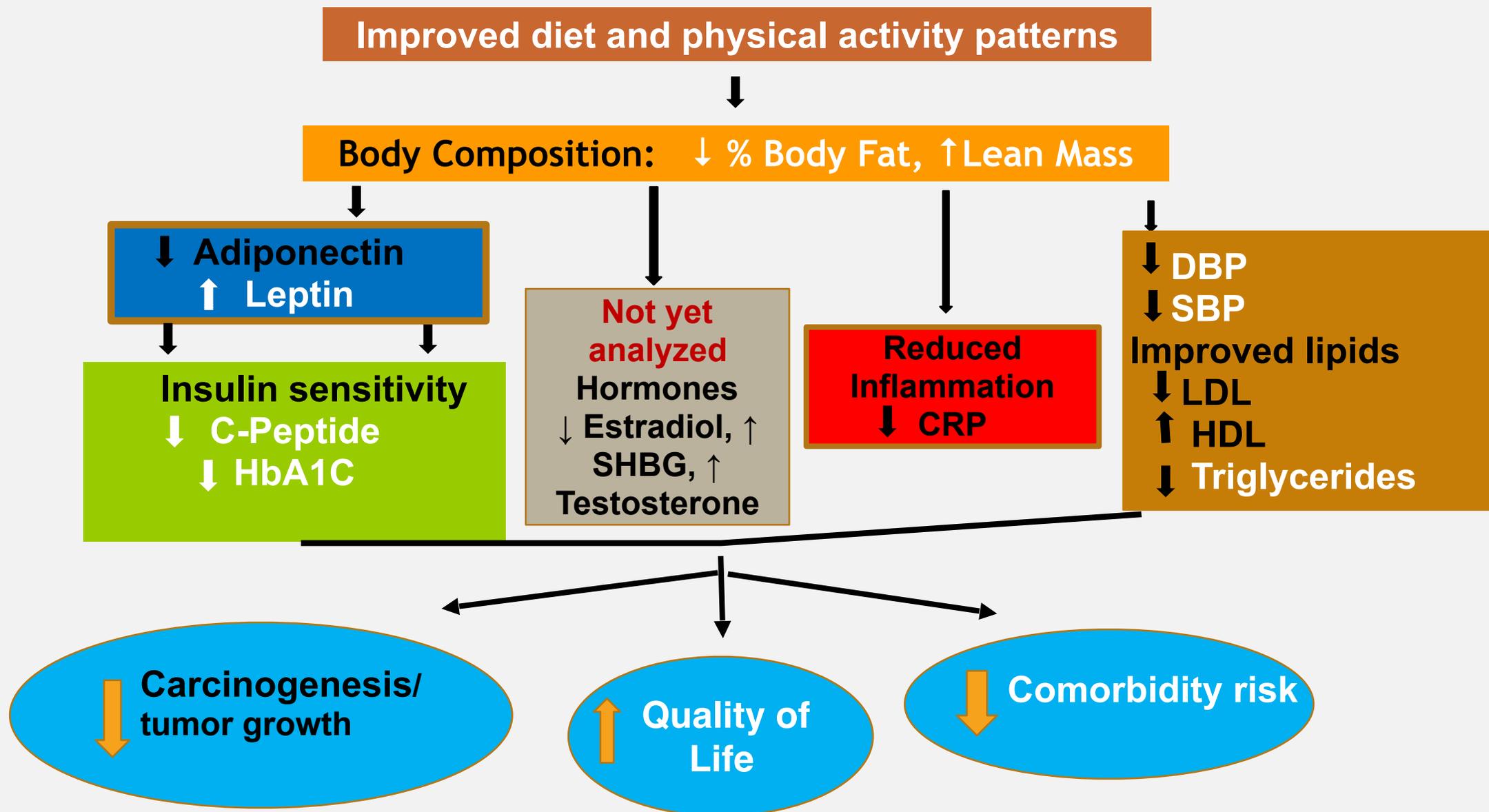
≤3% Weight Loss Across Groups

- HbA1c (p < 0.008)
- DBP (p < 0.004)
- SBP (p < 0.004)

QUALITY OF LIFE (PROMIS-10)



Biological Pathways' Results

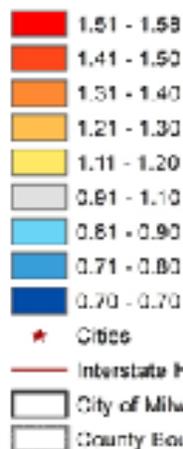


LIFESTYLE AND SURVIVORSHIP-RELATED EFFORTS IN MILWAUKEE

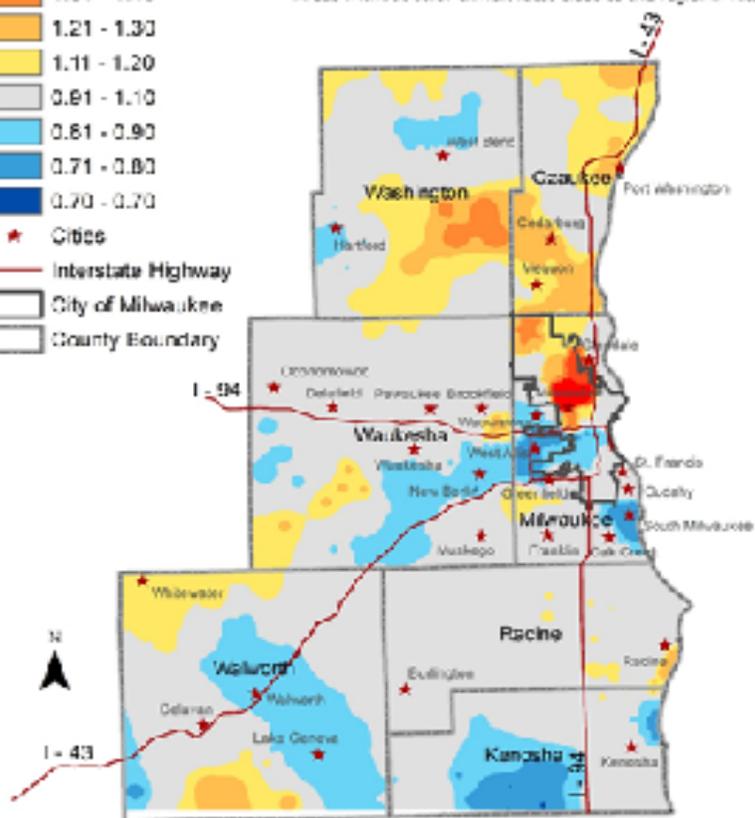


PROSTATE CANCER

Prostate Cancer Incidence Rate MCW Cancer Center Catchment Area 2008-2013



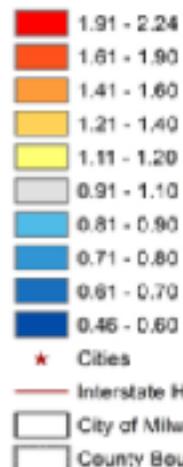
The invasive prostate cancer incidence rate is indirectly age standardized and smoothed using adaptive spatial filtering. A grid of points is used to estimate incidence rates continuously across the map, based on the 20 closest diagnosed cases. Red areas indicate higher rates than expected and blue areas indicate lower rates than expected, given the regional rate. Areas without color exhibit rates close to the regional rate.



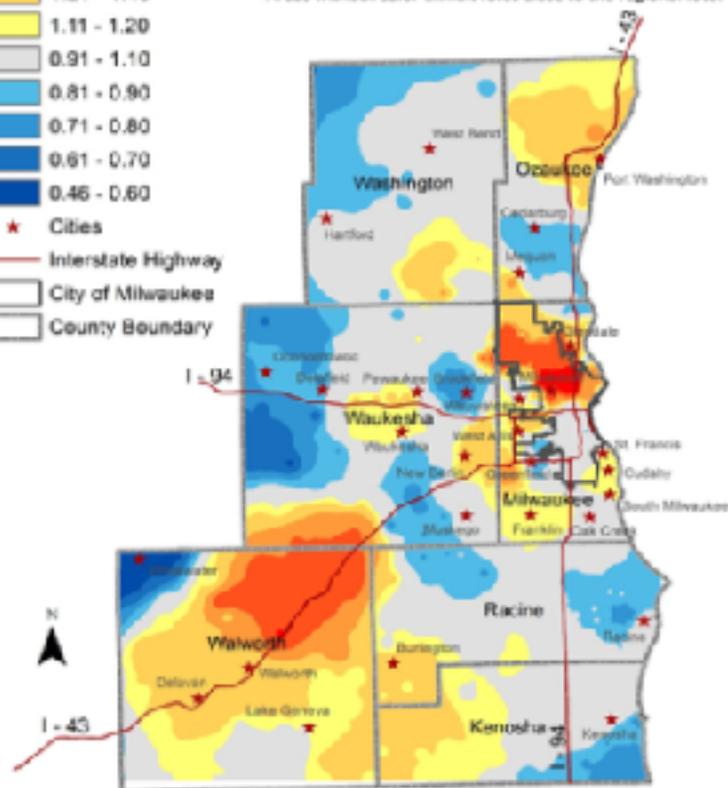
Created by: Yuhong Zhou, Kristen Beyer
Medical College of Wisconsin (2016)
Data Source: Wisconsin Cancer Reporting System, 2008-2013



Prostate Cancer Mortality Rate MCW Cancer Center Catchment Area 2008-2013



The prostate cancer mortality rate is indirectly age standardized and smoothed using adaptive spatial filtering. A grid of points is used to estimate mortality rates continuously across the map, based on the 20 closest prostate cancer mortality cases. Red areas indicate higher rates than expected and blue areas indicate lower rates than expected, given the regional rate. Areas without color exhibit rates close to the regional rate.



Created by: Yuhong Zhou, Kristen Beyer
Medical College of Wisconsin (7/2016)
Data Source: State Vital Records Office,
Department of Health Services 2008-2013



- **Health Behaviors contribute to body composition, but also contribute to prostate cancer related outcomes (HPFS and CaPSure)**
 - **Diet**
 - Animal fat increases risk for disease progression, PC specific and overall mortality
 - Adherence to Mediterranean diet associated with decreased all cause mortality
 - Fatty fish protective against disease progression
 - High cruciferous vegetable consumption associated with 58% decreased risk of PC progression
 - **Physical Activity - Active men have better outcomes**
 - 57% lower risk of disease progression among men walking 3+ mph
 - 61% reduced risk for overall and PC specific mortality for men who exercised ≥ 3 hours/week of vigorous activity compared to those who exercised <1 hour/week



AFRICAN AMERICAN
PROSTATE CANCER
SURVIVORS

EXPLORATORY STUDY

Diet and Physical Activity Patterns

Variable	Mean (SD)
Dietary Intake¹	
Saturated fat, grams	21.2 (8.9)
Added Sugar, grams	60.7 (53.4)
Fiber, grams	12.1 (5.2)
Fruits, cup equivalents	1.7 (1.3)
Vegetables, cup equivalents	1.6 (0.8)
Physical Activity²	
Insufficiently Active	18 (81.8)
Sufficiently Active	4 (18.2)
Resistance ex 2x/wk	2 (0.09)



EXPLORATORY STUDY:

SURVEY:

**DIET, PHYSICAL
ACTIVITY, QUALITY OF
LIFE**

FOCUS GROUP:

**UNMET NEEDS
INTEREST IN LIFESTYLE
PROGRAM**

Diet and Physical Activity Patterns

Variable	Mean (SD)
Dietary Intake¹	
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Physical Activity²	
Insufficiently Active	18 (81.8)
Sufficiently Active	4 (18.2)
Resistance ex 2x/wk	2 (0.09)

QUALITY OF LIFE

¹ US average = 50, SD=10;

² Includes the 10 men who reported sexual activity (either with or without a partner);

Note: 3 point difference considered clinically meaningful

PROMIS Domains¹			
Domain	AAPCS	SEER PCS	Gen'l Pop
	Mean	Mean	Mean
	(SD)	(SD)	(SD)
<u>Physical Function</u>	45.3 (9.5)	50.2 (0.3)	50 (10)
Depression	49.1 (9.0)	45.4 (0.3)	50 (10)
Anxiety	50.1 (7.1)	45.9 (0.3)	50 (10)
Fatigue	50.4 (10.8)	47.3 (0.3)	50 (10)
Sleep Disturbance	52.0 (7.4)	48.2 (0.3)	50 (10)
Ability to participate in Social Roles and Activities	51.0 (8.5)	55.1 (0.3)	50 (10)
<u>Pain Interference</u>	54.7 (9.7)	49.1 (0.3)	50 (10)
Social Isolation	43.9 (7.3)	NA	50 (10)
Sexual Functioning²			
<u>Interest in Sexual Activity</u>	41.6 (8.1)	NA	50 (10)
<u>Erectile Functioning</u>	43.6 (4.5)	NA	50 (10)



DISCUSSION SESSION RESULTS

Unhealthy Eating Patterns

- Need for increased diet related knowledge and skills
- Limited access to healthy eating resources
- Financial challenges



Limited Physical Activity and Strength Training

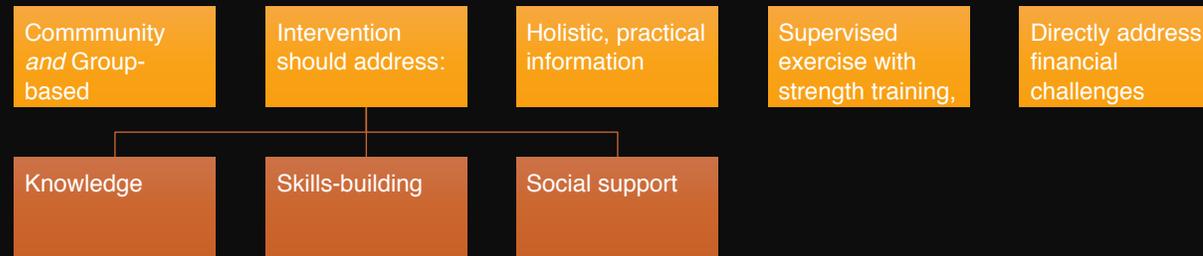
- Lack of knowledge



Quality of Life Challenges

- Limited social support concerns
- Information

INTERVENTION RECOMMENDATIONS



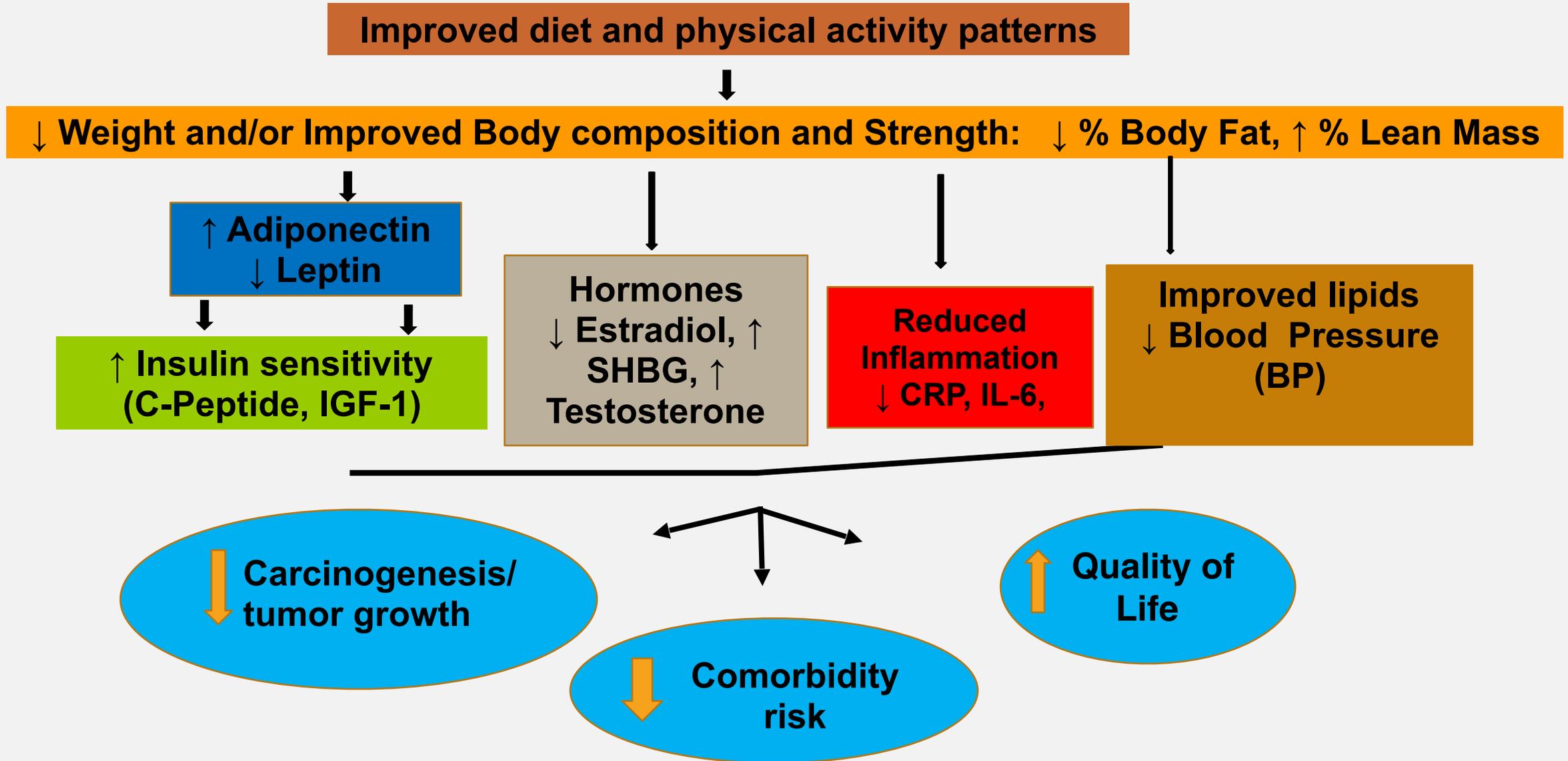


RANDOMIZED EFFICACY TRIAL WITH 200 AAPCS (2019-2023)

Collaborators: Drs. Banerjee, Bylow, Flynn, Kilari, Gann (UIC), Papanek (Marquette), Sheean (Loyola Chicago),

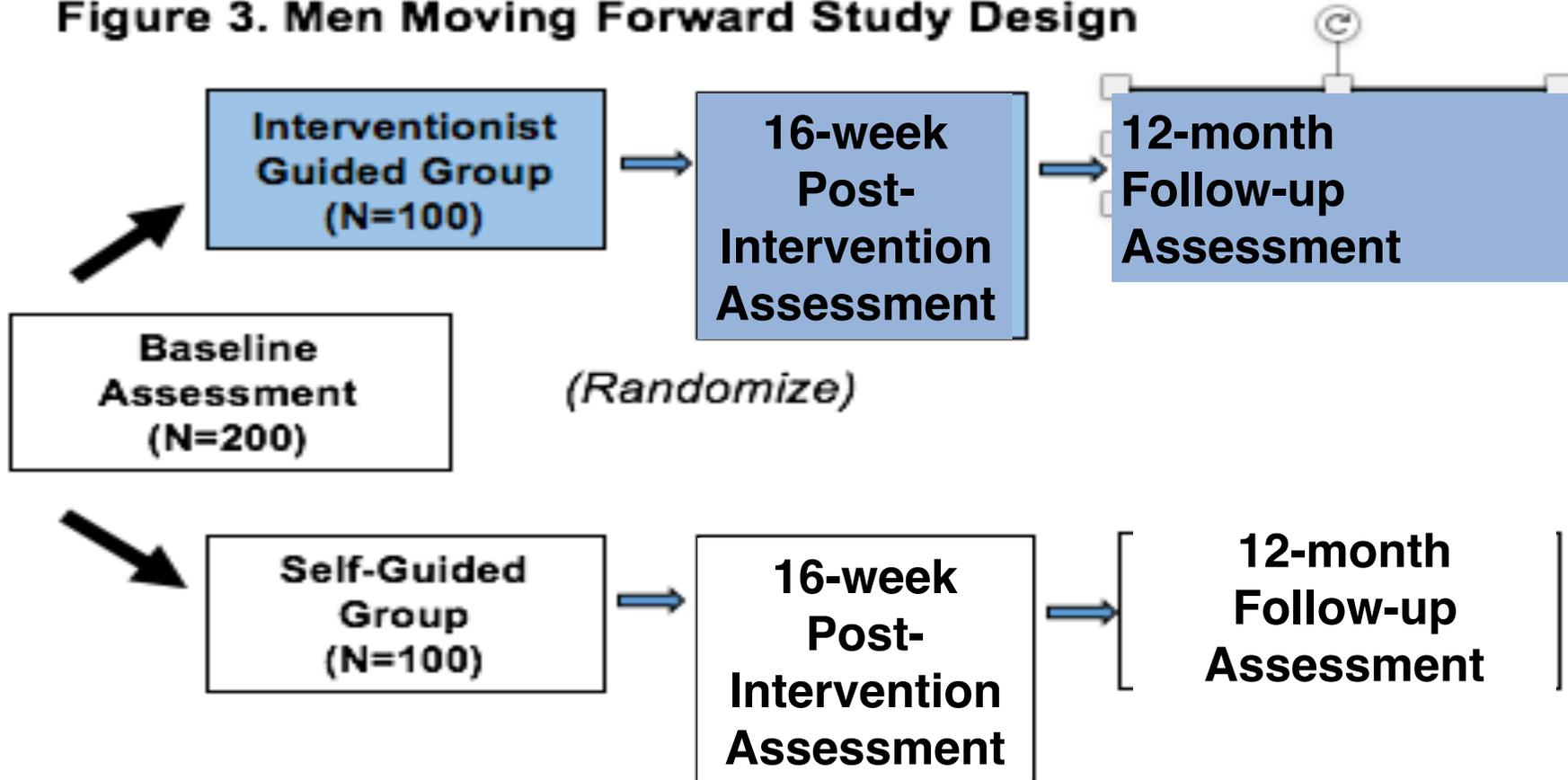
- Test the effects of a 16-week guided vs self-guided nutrition and physical activity intervention on:
 - Behavior - diet, physical activity
 - Body composition and strength – percent body fat, percent lean mass, strength
 - Biomarkers - adiponectin, leptin, C-peptide, IGF-1, IGFBP-3, C-Reactive Protein, estradiol, testosterone and sex hormone binding globulin
 - Exploratory - Mitochondrial function and miRNA
- Partnership with Milwaukee Public Rec – program currently held at North Division High School

Biological Framework



STUDY DESIGN

Figure 3. Men Moving Forward Study Design



DATA COLLECTION

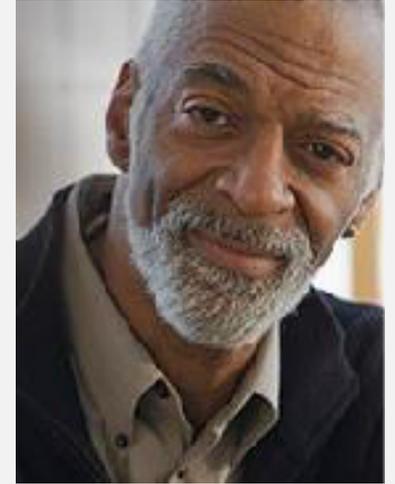
Interview: diet,
physical activity,
quality of life, self-
efficacy social
support, perceived
access to healthy
eating and exercise
resources, urban life
stress



Physical
Assessment: blood
draw, DEXA scan,
height/weight, waist
circumference,
strength, blood
pressure, sit to
stand, hand grip

ELIGIBILITY CRITERIA

- Diagnosed with non-metastatic prostate cancer
- Active surveillance OR have completed all treatments at least 6-months prior to study participation
- BMI ≥ 25 kg/m²
- Physically able to participate in moderate physical activity as documented by provider approval



ACS GUIDELINES

Get to and stay at a healthy weight

- If overweight or obese,



Eat a variety of healthy foods from plant sources

- Limit the amount of red meat and processed meat that you eat.



Be active

- Avoid inactivity
- Aim to exercise at least 150 minutes per week
- Include strength training exercises at least two days per week

INTERVENTION COMPONENTS

- Curriculum Binder
- Twice weekly classes
 - 2 hours - 1 hour with group learning and support; 1 hour supervised exercise
 - 1 hour supervised exercise
- Twice weekly text messaging targeting self-efficacy, social support, environmental resources
- Pedometer, resistance band



WEEK 4, THE TAKEAWAY

What is plant based eating and
How do I get started?

Simply put, **plant based eating is making sure your plate is mostly filled with food from plants.** Vegetables, fruits, whole grains, nuts, legumes (beans), and healthy oils (like olive).



How do I eat plant based?

Ideally, your plate at breakfast, lunch and dinner is mostly plant-based foods. Make whatever changes you can so that your meals begin to look like the picture on the next page. A healthy plant based meal should consist of portions of vegetables, fruits, whole grains, healthy protein and healthy oils.

WEEKLY TOPICS

Week 1	Lifestyle and prostate cancer.
Week 2	Stress and your mind, body, and behavior.
Week 3	American Cancer Society Nutrition and Physical Activity guidelines.
Week 4	Cooking Demo
Week 5	Why do body fat and muscle matter?
Week 6	Eating Plant-Based Affordably
Week 7	How We Make Behavior Changes...
Week 8	Cooking Demo
Week 9	Conversations with a cancer doc
Week 10	Sexual Health: Can lifestyle make a difference?
Week 11	Lifestyle activity, exercise and strength training
Week 12	Cooking Demo
Week 13	Addressing Barriers
Week 14	Maintaining Changes
Week 15	Knowing your motivators
Week 16	Graduation and final cooking demonstration



Are you an African-American prostate cancer survivor?

Would you like to get stronger, feel better and have more energy?



To participate you have to...

- Self-identify as Black or African-American;
- Be 18 years or older;
- Have completed treatment for prostate cancer at least six months prior;
- Have access to a mobile phone.

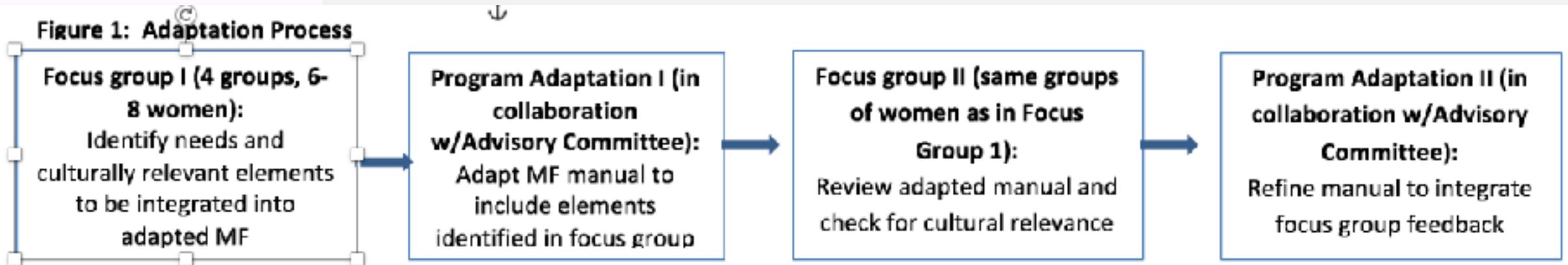
If you are eligible and agree to participate you will receive:

- Twice-weekly exercise sessions and nutritional education
- Supportive text messages
- Monthly group cooking classes

For more information and to sign up please contact us at (414) 955-4095 or email mmf@mcw.edu



- **Aim 1. To adapt the Moving Forward weight loss intervention for overweight/obese Hispanic BCS.**
- **Aim 2. To conduct a randomized pilot with 40 to establish the feasibility and explore the effects of Avanzando Juntas on anthropometric, behavioral, psychosocial and biological outcomes.**



**Collaborators: Drs. Banerjee, Kamaraju, Young, Sheean (Loyola)
Partnership with United Community Center**



LIFESTYLE INTERVENTION FOR WOMEN WITH MBC

- Explore feasibility, safety and efficacy of 12-week coach-supported lifestyle intervention
- 40 women with stable metastatic breast cancer randomized to immediate intervention and wait list control
- Primary outcome: Quality of Life
- Secondary outcomes: Body composition, strength, biomarkers of inflammation, mitochondrial function
- Preliminary results:
 - Feasible and safe
 - Significant improvement in quality of life, strength, fatigue, mitochondrial function

Collaborators: Dr. Chitambar, Dr. Banerjee, Dr. Sheean (Loyola Chicago)

Funded by National Cancer Institute R21CA218888

SUMMARY

- Obesity - as defined by adiposity and muscle - impacts cancer survivorship through quality of life and health outcomes
- Lifestyle determines body composition AND also impacts quality of life and health outcomes
- Supporting patients in lifestyle change is critical to their wellbeing
- Understanding why lifestyle matters scientifically can inform your work with patients
- Joining with researchers to study lifestyle and cancer will help move the science forward

THANK YOU TO COLLEAGUES

Anjishnu Banerjee, PhD

Katie Bylow, MD

Katheryn Flynn

Deepak Kilari, MD

Ken Jacobsohn, MD

William See, MD

Alexis Visotcky, MS

Paula Papanek, PhD
(Marquette)

Patricia Sheean, PhD (Loyola)



Sophia Abogaye

Jamal Jarett, MPH

Kathleen Jensik, MSW

Tina Johnson

Ana Manriquez Prado

Lauren Matthews, MPH

Jermaine Murry

Alexis Visotcky, MS

Leonard Wilson AND
MPS REC

THANK YOU



MEDICAL
COLLEGE
OF WISCONSIN