



Nutrition and Aging throughout the Cancer Journey

Wendy Demark-Wahnefried, PhD, RD
Professor and Webb Chair of Nutrition Sciences
Associate Director, UAB Comprehensive Cancer Center

NIH Award 1R25CA183723-01A1



Objectives

- To review reasons why nutrition is important from diagnosis and treatment, throughout survivorship, and in advanced disease
- To identify conditions that signal poor nutritional status
- To review interventions that address nutritional concerns
- To identify extant gaps in knowledge

Nutrition also is Important since it is an Independent Predictor for...

- Overall Quality of Life
- Treatment Toxicity and Outcomes
- Common Conditions: Sarcopenia
- Overall Survival

Prevalance of Malnutrition is High among Older Cancer Populations: Under and Overnutrition

- Undernourished: 13.3% (non-GI newly diagnosed outpatients) to 71% (in patients with advanced cancers)
- Overweight and Obesity 50-71% among older patients with early stage non-GI cancers.

Nutrition Screening Instruments

Mini Nutritional Assessment (MNA)	<ul style="list-style-type: none"> A. Decline in food intake over the past 3 months due to appetite, digestive problems, chewing, or swallowing difficulties B. Weight loss during the last 3 months C. Mobility D. Psychological stress or acute disease in the past 3 months E. Neuropsychological problems F. Body mass index or calf circumference
Malnutrition Screening Tool (MST)	<p>Have you been eating poorly because of decreased appetite? Have you lost weight recently without trying?</p>
Simplified nutritional appetite questionnaire (SNAQ)	<p>Patient ranks 4 items: appetite, satiety, taste, daily meals</p>
SCREEN II	<p>17-item tool with an 8 question abbreviated version</p>
Malnutrition Universal Screening Tool (MUST)	<p>BMI Weight loss over 3-6 months Anorexia for periods of 5 days or longer due to disease</p>
Nutritional Risk Screening (NRS)	<p>BMI % Weight Loss Change in food intake Disease severity rating</p>
Geriatric Assessment	<p>BMI % Weight Loss Difficulty chewing, impaired smell, inability to obtain or prepare food, decreased food intake</p>



Nutrition Red Flags

- Body Mass Index (kg/m^2) <22
- Weight loss $>2\%$ in 1 month, $>5\%$ in 6 months
- Hemoglobin <12 g/dl or albumin <3.2 g/dl
- Changes in appetite, ability to eat (physiologic or access)

Start of the Cancer Journey: Time at Diagnosis and Treatment

1: Screen

2: Set Goals:

- Maintain a healthy weight
- Preserve lean body mass
- Minimize nutrition-related side effects: mucositis, nausea, diarrhea.

3. Address common misperceptions:

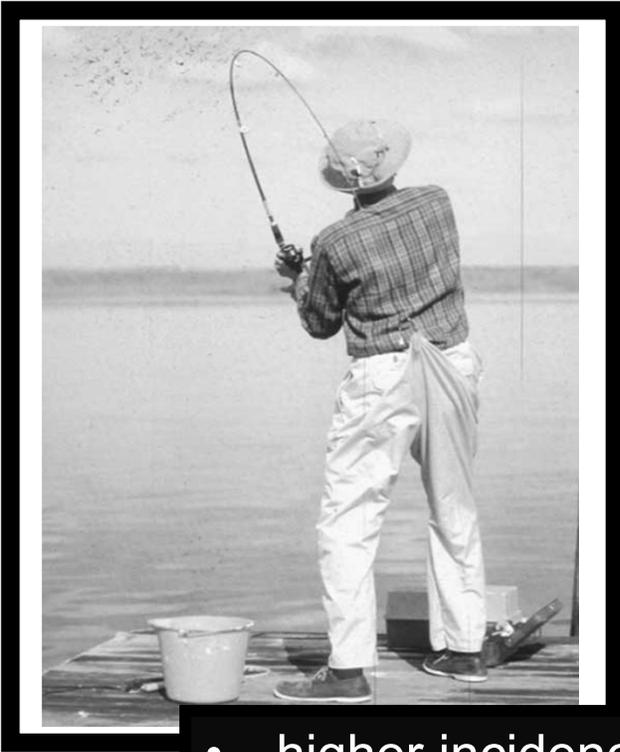
- Weight loss
- Nutritional supplements



Midway on Cancer Journey: Survivorship

- Goal: To prolong this phase as long as possible and prevent recurrence or comorbid illness
- Over 32.5 M Cancer Survivors Worldwide (~15.8 M in the US)
- 62% are age 65+





Cancer Survivorship: The Bad News!

- higher incidence of depression
- higher incidence of fatigue
- increased risk for osteoporosis, diabetes, cardiovascular disease & other cancers. Increased risk of death (cancer specific & all cause mortality – Hazards Ratio 1.37)
- adverse body composition change (osteoporosis & sarcopenia)
- increased risk for functional decline – threat to independence
- are high health care utilizers

Possible Solutions

	Diet	Exercise
Depression	✓	✓✓
Fatigue	✓	✓✓
Adverse Body Composition Change	✓	✓✓✓
Functional Decline	✓	✓✓✓
Comorbidity	✓✓✓	✓✓✓
Recurrent/Progressive Disease	✓✓ <i>Growing!</i>	✓✓ <i>Growing!</i>

✓ Possible benefit

✓✓ Probable benefit

✓✓✓ Convincing benefit

2012 American Cancer Society (ACS) Nutrition & Physical Activity Guidelines for Cancer Survivors

Achieve and maintain a healthy weight

If overweight or obese, limit high calorie foods & beverages increase physical activity to promote weight loss

Engage in regular physical activity

- Avoid inactivity; resume normal activities as soon as possible following dx
- Exercise ≥ 150 minutes/week
- Include strength training exercises at least 2 days/week

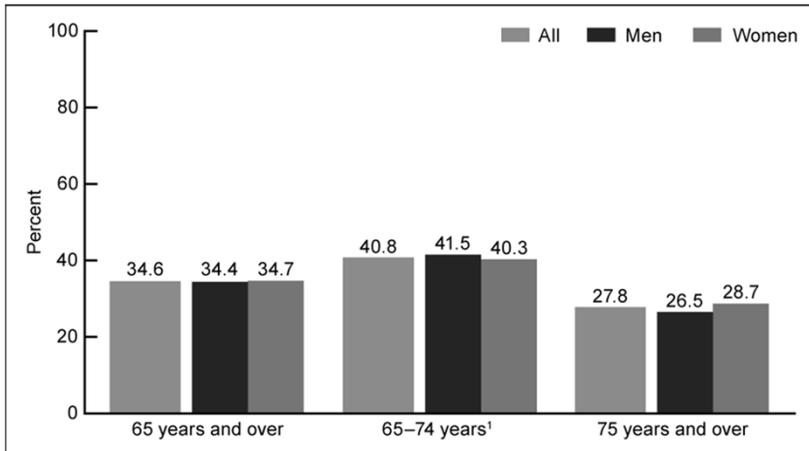
Achieve a dietary pattern that is high in vegetables, fruits and whole grains

- Follow ACS Guidelines on Nutrition & Physical Activity for Cancer Prevention
 - Choose foods & beverages in amounts that achieve/maintain a healthy weight
 - Limit processed and red meat
 - Eat ≥ 2.5 cups of vegetables & fruits/day
 - Choose whole grains instead of refined grain products
 - If you drink ETOH, drink ≤ 1 drink/day for ♀ & 2 drinks/day for ♂

Supplements

- Try to obtain nutrients through diet, first.
- Consider only if a nutrient deficiency is biochemically or clinically observed, or if intakes fall persistently below recommended levels as assessed by an RD.

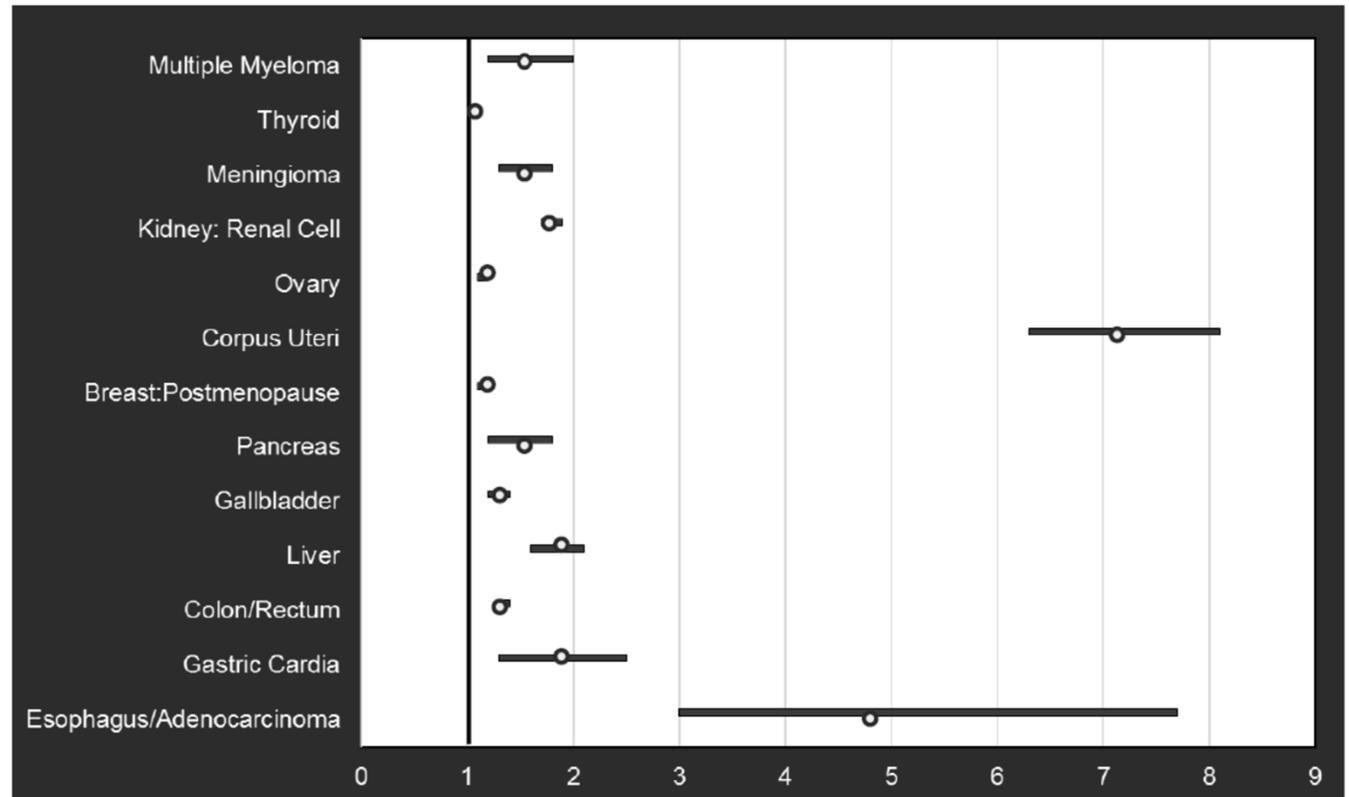
Figure 1. Prevalence of obesity among adults aged 65 and over, by sex: United States, 2007–2010



¹Significantly different from 75 years and over.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2007–2010.

Because of the obesity epidemic across all age groups...

... and, because overweight and obesity are risk factors for many cancers



More cancer survivors look like this



Not this

Estimated associations between health behaviors & physical function

Health Behavior	Point increase in SF36 Physical Function Subscale	P-value
Affirmative response to vigorous exercise 20 min at least 3 x weekly	15.4	P<.0001
One daily serving increase in F&V	0.9	P=.0049
1% decrease in total energy from fat	0.2	P<.0001

Justification for Dietary Interventions that Target Older Cancer Survivors

- 11.1% of older adults (n = 15,425) adhere to US guidelines for alcohol, tobacco, dietary fat and fruits & vegetables (F&V), and exercise. Most common lifestyle pattern among elderly is adherence to alcohol & tobacco guidelines, but not those for F&V, dietary fat, and exercise.

Berrigan et al. Prev Med 36:615,2003

- In a mixed sample of 190 older survivors, 60% reported distress due to weight change, 64% due to balance or mobility issues & 79% due to fatigue

Schlairet & Benton J Cancer Educ. 27:21, 2012

- In 753 older breast, prostate & CRC survivors, diet quality associated with ↑Physical QoL & higher BMI associated with ↓ QoL

Mosher et al. Cancer. 115:4001, 2009.

- Older female survivors (n=2,017) who practice 6-8 vs 0-4 WCRF/AICR Recommendations have 33% lower all cause mortality

Inoue-Choi et al. CEBP 22:792, 2013

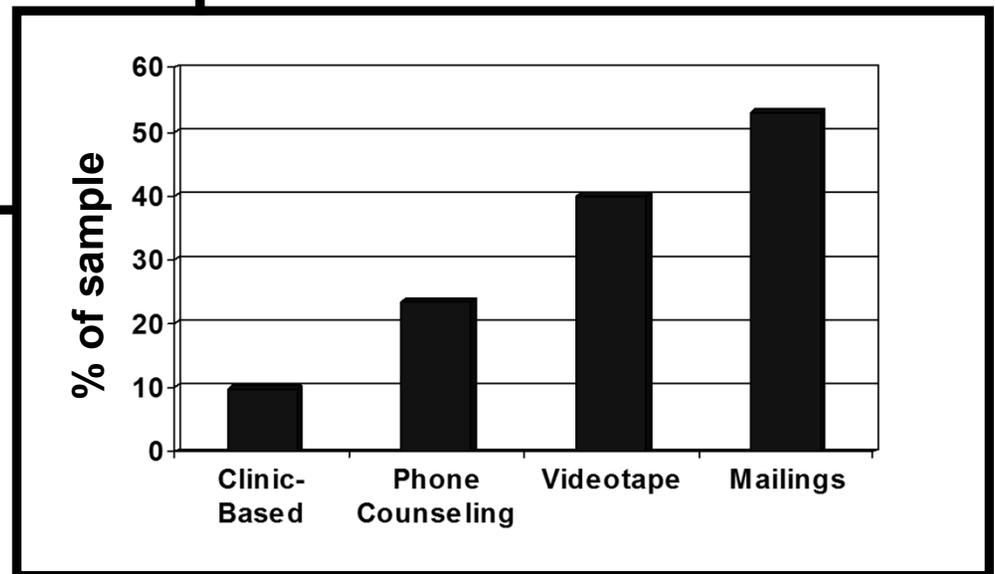
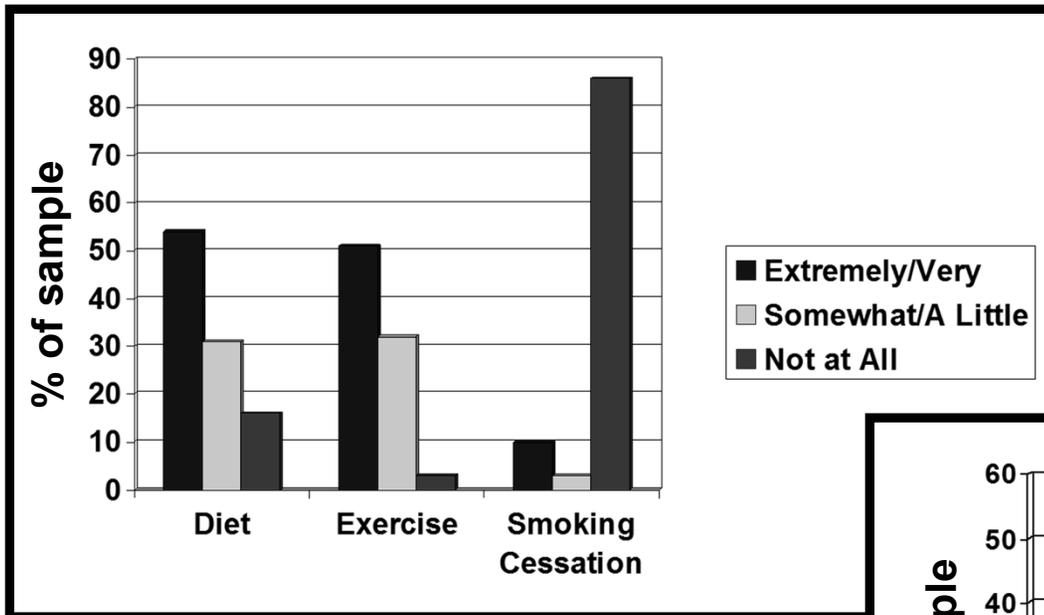
- Higher BMI ↑ odds of frailty by 12% (p=.003); higher PA ↓ odds of frailty by 10% (p <0.001) in 261 older BCS.

Bennett et al. Oncol Nurs Forum 40:E126, 2013



What Do We Know About Delivering Lifestyle Interventions to Cancer Survivors?

Mailed Survey Study 988 Breast & Prostate Cancer Survivors



RENEW

(Reach-out to ENhance Wellness in Older Survivors)

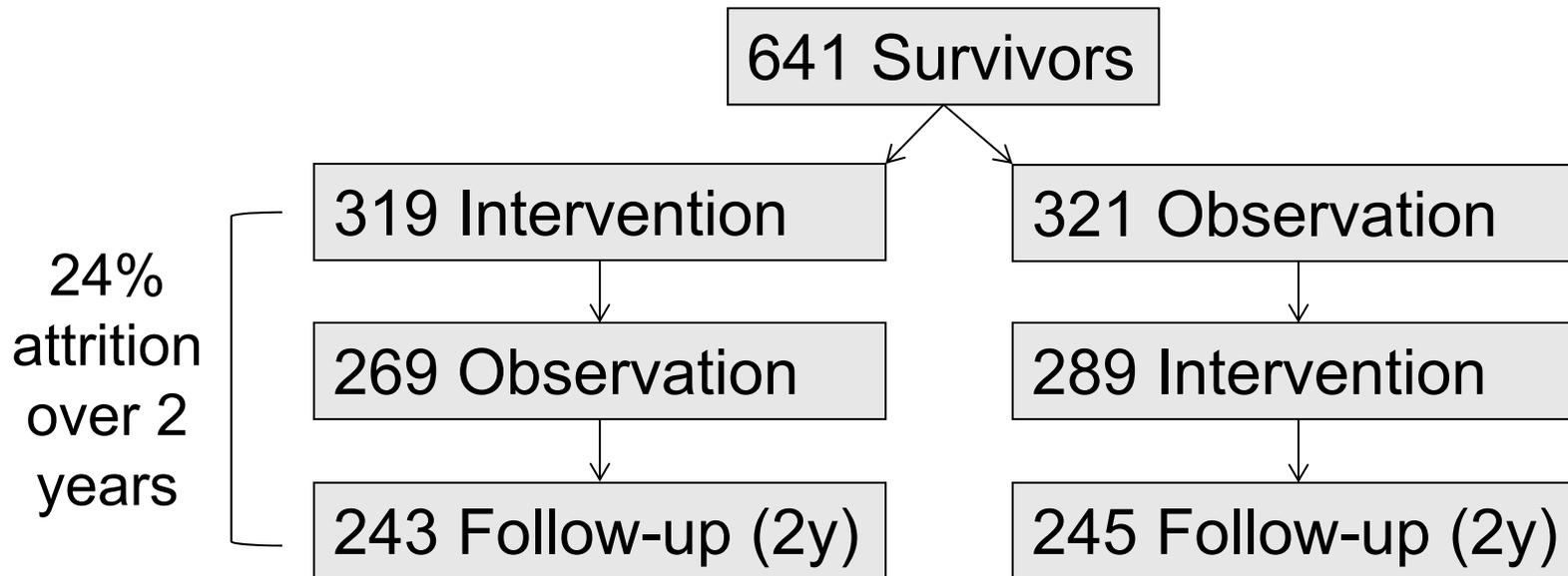


- RENEW (R01-CA106919)
- N=640
- Long-term Survivors of Breast, Prostate & Colorectal Cancers
- 11M Intervention Period – 2 year long-term follow-up
- 5 Tailored Mailings
- 15 Telephone Counseling Sessions
- 8 Telephone Prompts



Study Schema

Recruited Survivors through Self-Referral and Cancer Registries

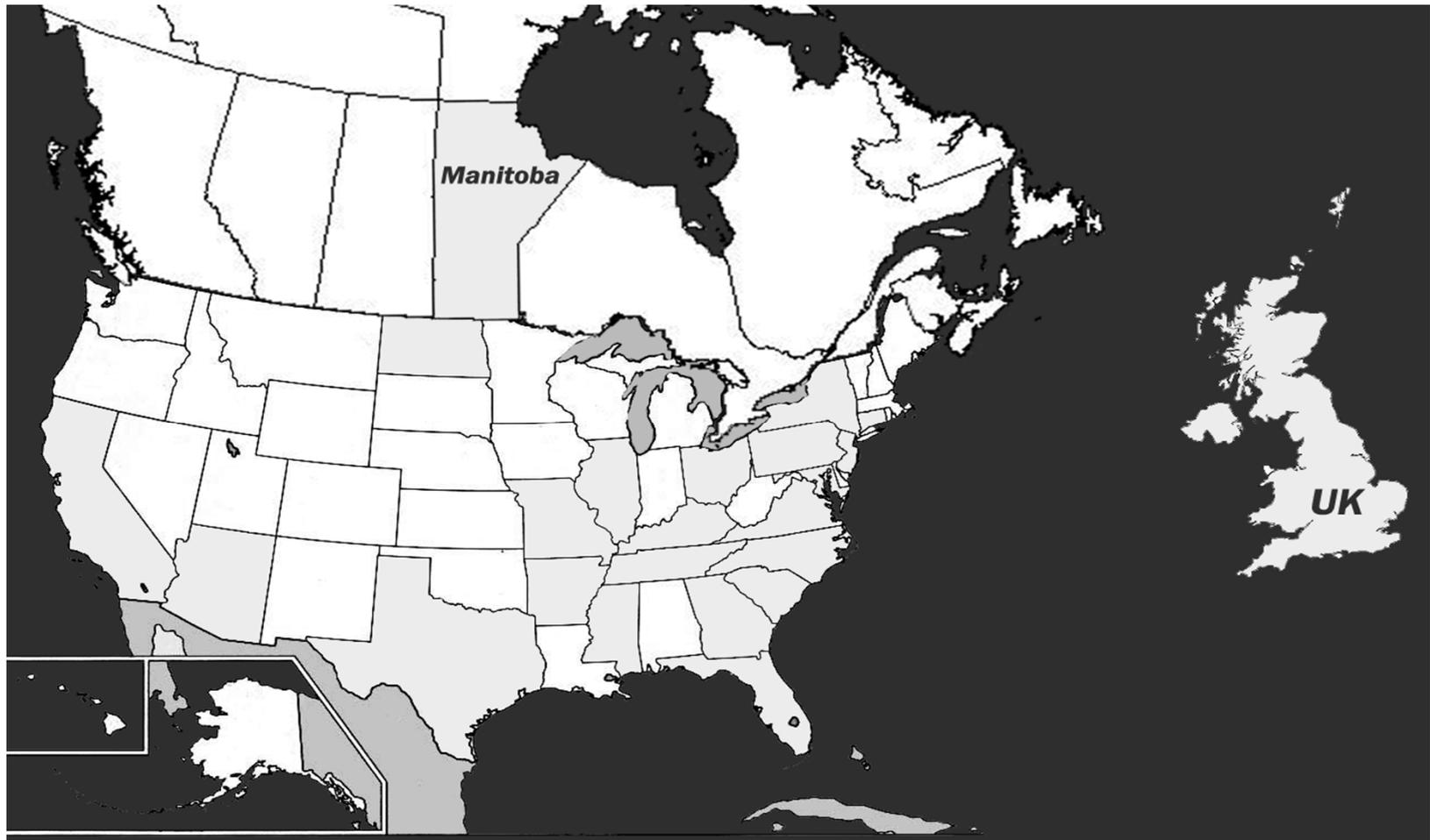


intent to treat analysis

RENEW Intervention Materials



Geographic Distribution of Participants Accrued for the RENEW Trail (n=641)

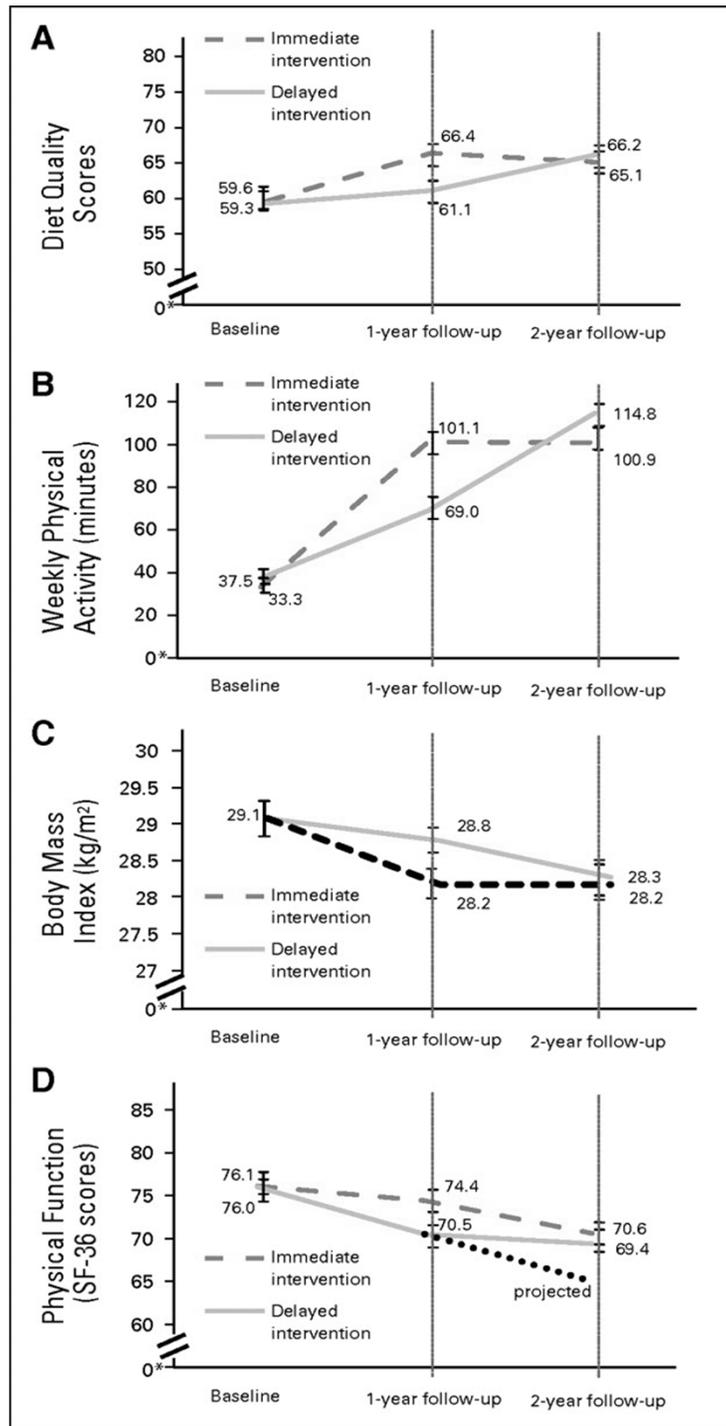


RENEW Study Sample Characteristics (n=641)

Age	73.1 (5.1) (range 65-87)
% Male	45%
% Caucasian	89%
Education	33% \leq HS 30% Some College 37% \geq College Grad
Type of Cancer	45% Breast 41% Prostate 14% Colorectal
% Cancer Registry	92%
Years since Dx	8.6 (2.7) (range 5-26)
# of Comorbidities	2 (1.2)
Current Smoker	6%
Physical Function (SF 36)	75.7 (18.9) (range 10-100)

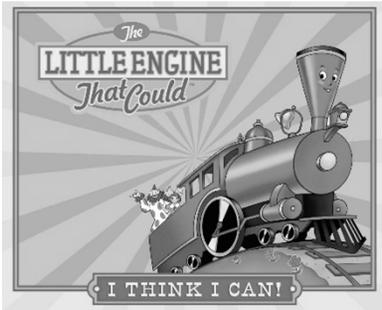
Results

	Δ Intervention Arm Mean (SE)	Δ Wait List Control Arm Mean (SE)	P- value
SF-36 Physical Function	-2.55 (1.07)	-5.39 (1.01)	.034
Basic Lower Extremity – LLF	+0.41 (0.71)	-2.11 (0.67)	.005
Adv. Lower Extremity – LLF	+0.44 (0.60)	-2.55 (0.61)	.015
Strength Exercise (min/w)	+22.2 (2.8)	+0.5 (3.0)	<.0001
Strength Exercise (session/w)	+1.4 (2.6)	+0.2 (2.5)	<.0001
Endurance Exercise (min/w)	+43.1 (5.7)	+26.1 (6.3)	<.0001
Endur. Exercise (session/w)	+1.6 (3.9)	+0.5 (4.1)	.005
F&V Intake (servings/d)	+1.48 (0.16)	+0.15 (0.12)	<.0001
Saturated Fat Intake (g/d)	-3.64 (0.61)	-1.19 (0.55)	.002
Healthy Eating Index	+7.1 (0.9)	+1.4 (0.8)	<.0001
Weight (kg)	-2.45 (0.22)	-1.03 (0.2)	<.0001
BMI	-0.82 (0.07)	-0.035 (0.08)	.0002
Quality-of-Life (Total SF-36)	+0.91 (0.86)	-2.17 (0.90)	.025



Baseline to 2-year changes in the immediate- vs delayed-intervention arms

Intervention is Replicable and Durable



Other Lessons Learned

- Mediation analyses suggest that self-efficacy is a robust mediator of behavior change Mosher CE et al. Psycho-Oncol 2008;17:1014
- Participation in telephone counseling significantly related to improvements in physical function, mental health, and weight loss Winger JG et al. Ann Behav Med 2014;48:235
- Latent class analyses show that less obese survivors with physical function scores of 65+ and higher self-efficacy for exercise show greatest gains in physical functioning Morey M et al. Cancer 2015;121:4433
- Structural equation modeling shows that improvements in physical functioning are negatively impacted by symptom burden, but also are significantly related to weight loss, increased physical activity and diet quality Kenzik KM et al. J Geriatr Oncol 2015; 6: 424

Getting Beyond the Stigma



June 18, 2013 AMA declared obesity a disease

5–A's

Ask:

- Have you heard about the relationship between body weight and cancer?
- Have you tried to lose weight recently?

Advise:

- Orient to BMI chart, show where they are currently, assess weight goals

Assess:

-

Assist:

-

Arrange:

-

Normal Weight

Overweight

Obese

BMI

19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

Height

Body Weight (pounds)

4'10	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
4'11	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
5'0	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
5'1	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
5'2	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
5'3	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
5'4	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
5'5	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
5'6	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
5'7	122	128	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
5'8	126	132	138	144	150	158	164	171	177	184	190	197	203	210	216	223	230
5'9	130	136	142	148	154	162	169	176	182	189	196	203	209	216	223	230	236
5'10	134	140	146	152	158	167	174	181	188	195	202	209	216	222	229	236	243
5'11	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
6'0	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
6'1	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
6'2	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272

Patient 1:
35 y/o stage II BC
5'4" 140 lbs

Normal Weight

Overweight

Obese

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Height	Body Weight (pounds)																	
4'10	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	
4'11	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	
5'0	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	
5'1	100	105	110	115	120	125	127	132	137	143	148	153	158	164	169	174	180	185
5'2	103	108	113	118	123	128	131	136	142	147	153	158	164	169	175	180	186	191
5'3	106	111	116	121	126	131	135	141	146	152	158	163	169	175	180	186	191	197
5'4	109	114	119	124	129	134	140	145	151	157	163	169	174	180	186	192	197	204
5'5	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	
5'6	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	

Patient 2:
65 y/o stage II BC
5'2" 175 lbs

175

Any weight loss would be good...you might see health benefits with a loss of 6 lbs (3%)

At what weight do you feel your best?

What's your lowest weight in the past 5-years?

What's your lowest weight during adulthood?

6'1	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
6'2	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272

5-A's

Ask:

- Have you heard about the relationship between body weight and cancer?
- Have you tried to lose weight recently?

Advise:

- Orient to BMI chart, show where they are currently, assess weight goals

Assess:

- Readiness to pursue weight loss

Assist:

-
-
-
-

Arrange:

-

Assess Readiness to Pursue Weight Loss Regimen

- Have you ever tried losing weight before?
- How successful were you?
- How do you feel about working to get your weight down now, by watching what you eat and exercising more?
- If patient is not ready – plant message regarding importance – reassess during future appointments

5–A's

Ask:

- Have you heard about the relationship between body weight and cancer?
- Have you tried to lose weight recently?

Advise:

- Orient to BMI chart, show where they are currently, assess weight goals

Assess:

- Readiness to pursue weight loss

Assist:

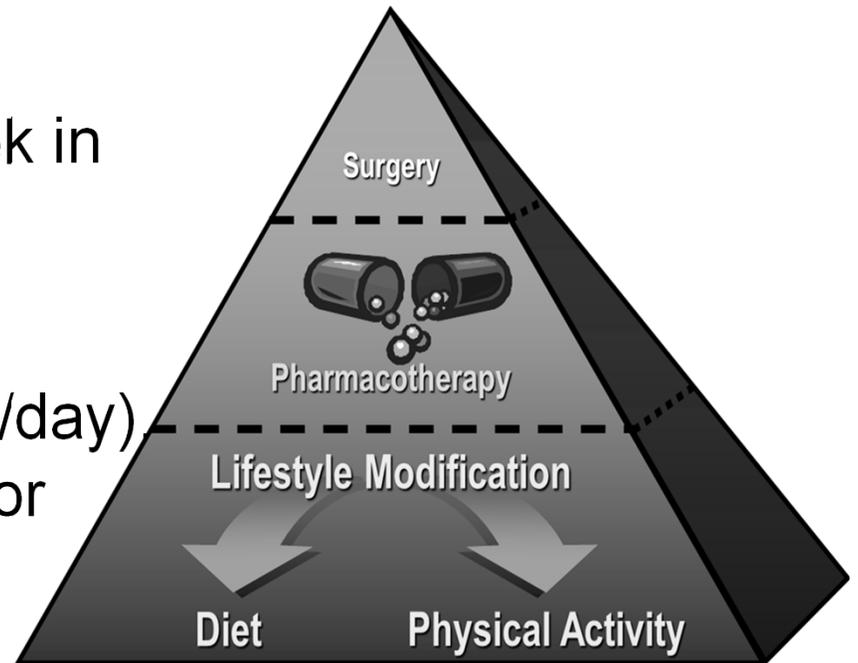
- Set a start date and incremental goals
- Provide brochures, point to select websites
- Promote foods low in kcal and high in nutrients (raw vegetables); limit foods high in kcal and low in nutrients (high sugar or fat) - regular soft drinks, fried foods, added fats and sugars, chips, desserts.
- Environmental control/Behavioral modification: minimize food cues, purposeful eating, etc.

Arrange:

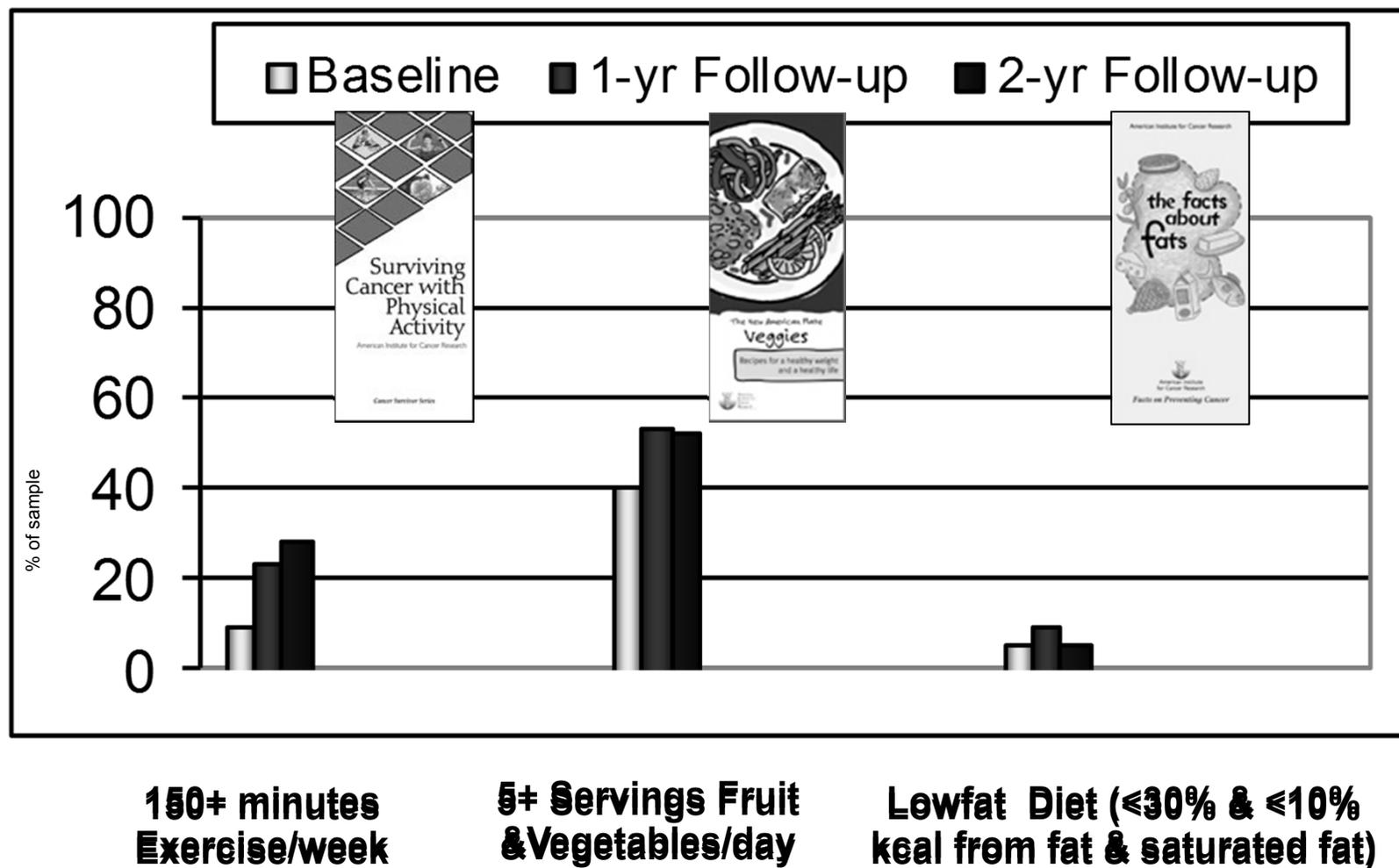
- Refer to registered dietitian, primary care physician, or specialist (bariatric medicine if Class II/III obese)

General Guidelines

- Loss of as little as 3% of body weight associated with health benefit
- Weight loss of up to 2 pounds/week in adults (go slower in younger AND older populations)
- Energy restriction(1200–1800 kcal/day) increased physical activity, behavior modification
- No recommendation regarding distribution of carbohydrate, fat and protein (Thomson C et al. *Nutr Cancer* 2010; Thompson H et al. *Breast Cancer Res* 2012).
- Self-monitoring: Weighing everyday, keeping a food and exercise log/journal, electronic devices



FRESH START (Breast & Prostate Cancer Survivors): Attainment of Goal Behavior of Attention Control Arm (n=272)



Christy et al. J Am Diet Assoc 111:1844, 2011
Ottenbacher et al Support Cancer Care 20: 2483, 2012

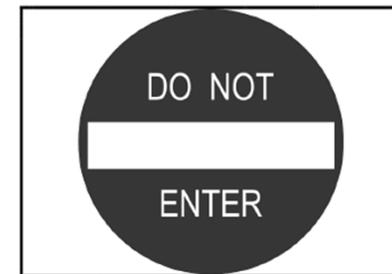
* <=30% total, <=10% sat. fat

End of the Cancer Journey: Advanced Disease – End of Life

1: Screen

2: Set Goals:

- Maintain a healthy weight
- Preserve lean body mass
- Minimize nutrition-related side effects: nausea, diarrhea
- Manage Cachexia
 - NSAIDS, Megestrol Acetate
 - Diet-related Interventions
 - Physical Activity



Acknowledgments

RENEW

R01-CA106919/P20-NR07795 and the Mary Duke Biddle and
Susan G. Komen Foundations

Miriam Morey, PhD

Harvey J. Cohen, MD

Carl Pieper, PhD

Denise Snyder, MS, RD

Richard Sloane, MS, MPH

Bercedis Peterson, PhD

Kelly Kenzik, PhD

Catherine Mosher, PhD

Jospeh Winger, PhD

Valeda Stull

Pamela Eberle Wiley, MS, RD

Jennifer Laheta, M.Ed.

Nyamka Williams, M.Ed.

Pennsylvania State University

Terri Hartmann, PhD, RD

Paige Miller, MS

Diane Mitchell, MS, RD

To all our study participants!



Conclusions

- Nutritional screening and intervention are important throughout the cancer journey and can positively influence clinical outcomes, and quality and quantity of life
- Nurses can play an important role in assessing and intervening to improve the nutritional status of the older cancer survivor. Several resources are available.

Resources

- American Cancer Society: www.cancer.org
- American Dietetic Association: www.eatright.org
- American Institute for Cancer Research:
www.aicr.org
- Centers for Disease Control:
www.cdc.gov/HealthyLiving
- LIVESTRONG <http://www.livestrong.com/myplate/>
- National Center for Complementary & Integrative Health: <https://nccih.nih.gov/health>

Case study

Henry is a 74-year old man recently dx'd with metastatic prostate cancer. Ht: 6'0" Wt: 240; sedentary. Meds: Lovastatin, Coumadin, HCTZ, and Rosiglitazone. Scheduled for ADT. He has been online and started taking "Prostate Health" (contains zinc, selenium, copper, cranberry powder, saw palmetto, beta sitosterol, and lycopene), and calcium and vitamin D. He is very anxious and wants to know what else he should take.