

## Supplementary Online Content

Association of survival with adherence to the American Cancer Society Nutrition and Physical Activity Guidelines for Cancer Survivors after colon cancer diagnosis: findings from the CALGB 89803/Alliance trial. Published online April 12, 2018. *JAMA Oncology*. doi:10.1001/jamaoncol.2018.0126

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This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1. Food items included in the ACS Nutrition and Physical Activity Diet Sub-score**

<b>Category</b>	<b>Items</b>
<b>Fruits</b>	Raisins (1 oz. or small pack) or grapes; prunes (7 prunes or ½ cup); bananas (1); cantaloupe (1/4 melon); avocado (1/2 fruit or ½ cup); applesauce (1/2 cup); fresh apples or pears (1); oranges (1); grapefruit (1/2); strawberries, fresh, frozen or canned (1/2 cup); blueberries, fresh, frozen or canned (1/2 cup); peaches, apricots, or plums (1 fresh, or ½ cup canned);
<b>Vegetables</b>	Tomatoes (1); tomato sauce (1/2 cup) e.g., spaghetti sauce; salsa, picante or taco sauce (1/4 cup); tofu or soybeans (3-4 oz.); string beans (1/2 cup); broccoli (1/2 cup); cabbage or cole slaw (1/2 cup); cauliflower (1/2 cup); Brussels sprouts (1/2 cup); carrots, raw (1/2 carrot or 2-4 sticks); carrots, cooked (1/2 cup) or carrot juice (2-3 oz.); corn (1 ear or ½ cup frozen or canned); peas or lima beans (1/2 cup fresh, frozen or canned); mixed vegetables (1/2 cup); beans or lentils, baked or dried (1/2 cup); dark orange (winter) squash (1/2 cup); eggplant, zucchini or other summer squash (1/2 cup); yams or sweet potatoes (1/2 cup); spinach, cooked (1/2 cup); spinach, raw as in salad (1/2 cup); kale, mustard, or chard greens (1/2 cup); iceberg or head lettuce (serving); romaine or leaf lettuce (serving); celery (4" stick); green peppers (3 slices or ¼ pepper); onions as a garnish or in a salad (1 slice); onions as a vegetable, rings or soup (1 onion)
<b>Whole Grains</b>	Whole grain cold breakfast cereal (1 cup); cooked oatmeal/cooked oat bran (1 cup); other cooked breakfast cereal (1 cup); dark bread (slice), including wheat pita bread; brown rice (1 cup); other grains, e.g., bulgar, kasha, couscous, etc. (1 cup); oat bran, added to food (1 tbs.); other bran, added to food (1 tbs.); wheat germ (1 tbs.)
<b>Refined Grains</b>	Non-whole grain cold breakfast cereal (1 cup); white bread (slice), including pita bread; bagels, English muffins, or rolls (1 whole); muffins (regular) or biscuits (1); white rice (1 cup); pasta, e.g., spaghetti, noodles, etc. (1 cup); pancakes or waffles (3 pieces); crackers, triscuits, wheat thins (5)
<b>Red and Processed Meats</b>	Bacon (2 slices); beef or pork hot dogs (1); salami, bologna, or other processed meat sandwiches; processed meats, e.g., sausage, kielbasa, etc. (2 oz. or 2 small links); hamburger, lean or extra lean (1 patty); hamburger, regular (1 patty); beef, pork, or lamb as a sandwich or mixed dish, e.g., stew, casserole, lasagna, etc.; pork as a main dish, e.g., ham or chops (4-6 oz.); beef or lamb as a main dish, e.g., steak, roast (4-6 oz.)
<b>Alcohol</b>	Beer, regular (1 glass, bottle, can); light beer, e.g., Bud Light (1 glass, bottle, can); red wine (4 oz. glass); white wine (4 oz. glass); liquor, e.g., whiskey, gin, etc. (1 drink or shot)

**eTable 2. Description of ACS Nutrition and Physical Activity Guidelines for Cancer Survivors score**

Recommendation	Possible Points
<p>“Achieve and maintain a healthy body weight”</p> <ul style="list-style-type: none"> <li>If overweight or obese, limit consumption of high-calorie foods and beverages and increase physical activity to promote weight loss.</li> </ul>	<p><b>0-2</b></p> <p>0: BMI <math>\geq 30</math> kg/m<sup>2</sup>            1: BMI 25 - &lt;30 kg/m<sup>2</sup>            2: BMI 18.5 - &lt;25 kg/m<sup>2</sup></p>
<p>“Engage in regular physical activity”</p> <ul style="list-style-type: none"> <li>“Aim to exercise at least 150 minutes per week.”</li> </ul>	<p><b>0-2</b></p> <p>0: &lt;8.75 MET-h/wk            1: 8.75 - &lt;17.5 MET-h/wk            2: <math>\geq 17.5</math> MET-h/wk</p>
<p>“Achieve a dietary pattern that is high in vegetables, fruits, and whole grains. Follow the ACS Guidelines on Nutrition and Physical Activity for Cancer Prevention”<sup>a</sup></p> <ul style="list-style-type: none"> <li>“Limit consumption of processed meat and red meat”</li> <li>“Eat at least 2.5 cups of vegetables and fruits each day (<math>\geq 5</math> servings/day)”</li> <li>“Choose whole grains instead of refined grain products”</li> </ul>	<p><b>0-2<sup>1</sup></b></p> <p>0-3 points corresponding to quartiles of red and processed meat intake, reverse scored</p> <p>0: &lt;5 servings/day, 1: <math>\geq 5</math> servings/day plus            1 or 2 points for being in the 2<sup>nd</sup> or 3<sup>rd</sup> tertile of number of unique fruits and vegetables eaten per month</p> <p>0-3 points corresponding to quartiles of percent of grains that are whole</p>
<p>“Alcoholic drinks up to one or 2 drinks per day (for women and men, respectively) can lower the risk of heart disease, but higher levels do not offer additional benefits”<sup>b</sup></p>	<p><b>0-2</b></p> <p>0: &gt;1 drink/d for women, &gt;2 drinks/d for men            1: Non-drinker            2: &gt;0 – 1 drink/d for women, &gt;0 to 2 drinks/d for men</p>

Abbreviations: BMI, body mass index; MET, metabolic equivalent task value.

<sup>a</sup> Dietary factors, including fruits and vegetables, whole grains, and red and processed meat, were summed and individuals with 0-2 diet points were given 0 points, 3-6 points were given 1 point, and 7-9 points were given 2 points. For the Alternate score including fish and sugar-sweetened beverages, individuals with 0-5 points were given 0 points, 6-10 points were given 1 point, and 11-15 points were given 2 points.

<sup>b</sup> Alcohol was not included in the main 2012 guidelines, but is described in the text and data suggest the ACS guidelines score with alcohol may be associated with lower cancer mortality.<sup>9,21</sup>

**eTable 3. Alternative post-diagnostic ACS Guidelines Scores in relation to overall and disease-free, and recurrence-free survival among 992 colon cancer patients**

	ACS Guidelines Score with alternative BMI cut-points <sup>a</sup>					<i>P</i> -trend <sup>b</sup>
	0-1	2	3	4	5-6	
No. at risk	138	232	285	204	133	
<b>Overall mortality</b>						
Events	49	86	86	51	27	
Model 1 HR (95% CI) <sup>c</sup>	1.00	1.00 (0.69, 1.45)	0.73 (0.50, 1.05)	0.64 (0.42, 0.97)	0.43 (0.26, 0.72)	<0.001
Model 2 HR (95% CI) <sup>d</sup>	1.00	0.96 (0.66, 1.39)	0.71 (0.49, 1.04)	0.61 (0.40, 0.93)	0.43 (0.26, 0.72)	<0.001
<b>Cancer recurrence or death from any cause (disease-free survival)</b>						
Events	59	103	111	66	39	
Model 1 HR (95% CI) <sup>c</sup>	1.00	1.10 (0.80, 1.52)	0.91 (0.66, 1.25)	0.74 (0.52, 1.05)	0.61 (0.41, 0.92)	<0.001
Model 2 HR (95% CI) <sup>d</sup>	1.00	1.04 (0.75, 1.43)	0.90 (0.66, 1.24)	0.73 (0.51, 1.04)	0.60 (0.40, 0.91)	0.002
<b>Cancer recurrence (recurrence-free survival)</b>						
Events	51	87	100	61	36	
Model 1 HR (95% CI) <sup>c</sup>	1.00	1.10 (0.78, 1.55)	0.98 (0.70, 1.38)	0.81 (0.56, 1.18)	0.68 (0.44, 1.04)	0.02
Model 2 HR (95% CI) <sup>d</sup>	1.00	1.00 (0.70, 1.42)	0.95 (0.68, 1.34)	0.77 (0.53, 1.13)	0.64 (0.42, 0.99)	0.01

Abbreviations: ACS, American Cancer Society; BMI, body mass index; HR, hazard ratio; CI, confidence interval.

<sup>a</sup> BMI was scored as follows: 0 points for  $\geq 35$ , 1 point for 18.5 to 22.9 or 30-34.9, 2 points for 23-29.9 kg/m<sup>2</sup>.

<sup>b</sup> *P*-trend calculated by modeling the median of each category as a continuous term.

<sup>c</sup> Cox proportional hazards regression model adjusted for age, sex, and total caloric intake.

<sup>d</sup> Cox proportional hazards regression model adjusted for variables in Model 1 plus T-stage, number of positive lymph nodes, baseline performance status, treatment arm, smoking, and aspirin use.

**eTable 4. ACS Guidelines Score Components after diagnosis in relation to overall survival among 992 colon cancer patients**

	Least concordant with guidelines		Most concordant with guidelines	
<b>BMI (kg/m<sup>2</sup>)</b>	<b>≥30</b>	<b>25-29.9</b>	<b>18.5-24.9</b>	
Median, kg/m <sup>2</sup>	33.5	27.4	23.0	
No. at risk	344	363	285	
Events	115	93	91	
HR (95% CI) <sup>a</sup>	1.0 (ref.)	0.59 (0.44, 0.80)	0.96 (0.70, 1.31)	
<b>Physical activity (MET-h/wk)</b>	<b>&lt;8.75</b>	<b>8.75-17.4</b>	<b>≥17.5</b>	
Median, MET-h/wk	2.7	12.0	32.2	
No. at risk	560	181	251	
Events	195	42	62	
HR (95% CI) <sup>a</sup>	1.0 (ref.)	0.64 (0.45, 0.92)	0.58 (0.42, 0.81)	
<b>Diet Sub-score Components</b>				
<b>Fruit and vegetable intake, servings/d</b>	<b>&lt;5</b>	<b>≥5</b>		
Median, servings/d	1.7	5.1		
No. at risk	899	93		
Events	267	32		
HR (95% CI) <sup>a</sup>	1.0 (ref.)	0.60 (0.38, 0.94)		
<b>Fruit and vegetable variety, <sup>b</sup>tertile</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	
Median, number of unique vegetables and fruits/month	21.7	28.2	33.4	
No. at risk	333	331	328	
Events	117	95	87	
HR (95% CI) <sup>a</sup>	1.0 (ref.)	0.73 (0.54, 0.99)	0.85 (0.62, 1.17)	
<b>Percentage of whole grains, <sup>c</sup>quartile</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>
Median, %	11.2	36.5	55.7	76.7
No. at risk	249	247	249	247
Events	93	81	63	62
HR (95% CI) <sup>a</sup>	1.0 (ref.)	0.98 (0.70, 1.36)	0.72 (0.50, 1.03)	0.65 (0.45, 0.94)
<b>Red and processed meat intake, quartile</b>	<b>Q4</b>	<b>Q3</b>	<b>Q2</b>	<b>Q1</b>
Median, servings/d	1.6	1.0	0.7	0.4
No. at risk	250	248	248	246
Events	61	78	78	82
HR (95% CI) <sup>a</sup>	1.0 (ref.)	1.42 (0.98, 2.05)	1.41 (0.95, 2.10)	1.72 (1.15, 2.58)
<b>Alcohol (drinks/d)</b>	<b>&gt;2 for men &gt;1 for women</b>	<b>None</b>	<b>&gt;0 to 2 for men &gt;0 to 1 for women</b>	
Median, drinks/d (men)	2.9	0	0.3	
Median, drinks/d (women)	1.6	0	0.1	
No. at risk	88	350	554	
Events	30	118	151	
HR (95% CI) <sup>a</sup>	1.28 (0.81, 2.01)	1.0 (ref.)	0.87 (0.66, 1.14)	

Abbreviations: ACS, American Cancer Society; BMI, body mass index; HR, hazard ratio; CI, confidence interval; MET-h/wk, metabolic equivalent task hours per week.

<sup>a</sup> Cox proportional hazards regression model adjusted for age, sex, total caloric intake, T-stage, number of positive lymph nodes, baseline performance status, treatment arm, smoking, aspirin use, and other ACS score components. Diet sub-score components are additionally adjusted for one another.

<sup>b</sup> Fruit and vegetable variety was defined as the number of unique fruits and vegetables consumed per month.

<sup>c</sup> Proportion of whole grains was defined as the proportion of all grains consumed that were whole. 2 patients consumed no grains and were assigned 100%.