

## Feasibility and acceptability of a web-based dietary intervention with text messages for colorectal cancer (SUCCEED): a randomized pilot trial

Erin L. Van Blarigan, Stacey A. Kenfield, June M. Chan, Katherine Van Loon, Alan Paciorek, Li Zhang, Hilary Chan, Marissa Savoie, Andrea Grace Bocobo, Vivian Liu, Louis X Wong, Angela Laffan, Chloe E. Atreya, Christine Miaskowski, Yoshimi Fukuoka, Jeffrey A. Meyerhardt, Alan P. Venook

**Figure S1a.** Profile page of the SUCCEED intervention website.

Receive exclusive text messages from our team of experts! Our daily messages will help you adopt healthy eating habits and keep you motivated.

Text messages:  ON

When do you want to receive our messages? Evening ▾

Sweetened Beverages:  ON

Vegetables:  ON

Alcoholic Beverages:  ON







Processed Meats:  ON

Whole Grains:  ON


Fish:  ON

**Figure S1b.** Set Goals page of the SUCCEED intervention website.

### SET GOALS



#### Sweetened Beverages per week



Servings:


**SET GOAL**

Avoid sugar-sweetened beverages.  
Drink water or coffee with no sugar.

[See Recommendations >](#)


**Figure S1c.** Tracking page of the SUCCEED intervention website.

**TRACK**



< **March 27, 2018**

**Whole Grains**



Servings:

**SAVE**

You have met your goal of 1 serving of Whole Grains per day.

[View progress >](#)

**Figure S1d.** View Progress page of the SUCCEED intervention website.

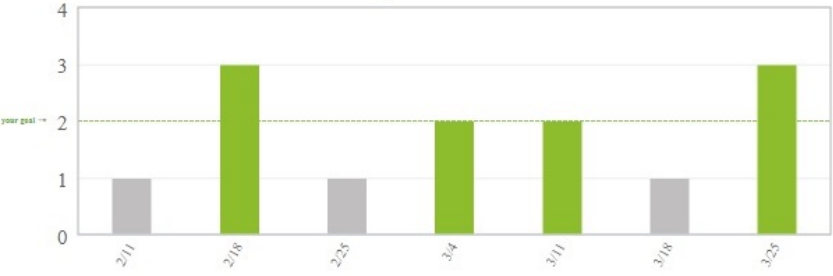
**VIEW PROGRESS**



**Fish**

Your goal: 2 or more servings per week

**Servings Per Week** day view >



Week	Servings	Goal Met
3.25.2018 - 3.31.2018	3	✓
3.18.2018 - 3.24.2018	1	
3.11.2018 - 3.17.2018	2	✓

**Table S1.** The first two weeks of text messages in a dietary intervention program for people with colorectal cancer. Participants were sent one message per day for 84 days (12 weeks).

**Day 1:** "(1/3) Welcome to the Succeed Study brought to you by UCSF. Each day, you'll receive a message from us. Customize your texts at [url]",  
"(2/3) If you have any questions, contact the SUCCEED study team at: [url] ",  
"(3/3) If you feel ill or get injured, call your doctor or 911. Please respond 'Y' to confirm that you received this message."

**Day 2:** "(1/2) Over the next 12 weeks, we recommend that you eat 5+ servings/day of vegetables, 3+ servings/day of whole grains, and 2+ servings/week of dark fish.",  
"(2/2) If you drink alcohol, do so in moderation. Avoid processed meats and sugar-sweetened beverages."

**Day 3:** "Making changes to your diet is hard. Start small and add more changes gradually."

**Day 4:** "Keep track of your hard work at [url]"

**Day 5:** "A diet high in red/processed meats, refined grains, potatoes, and sweets after colon cancer is associated with a 2-fold higher risk of recurrence and death."

**Day 6:** "Preparation is key to success! Use our meal planning guide to plan your meals at the start of each week: [url]"

**Day 7:** "Dedicate time each week to prep batches of vegetables and whole grains to have ready to go for meals and snacks."

**Day 8:** "Take a moment to review and update your diet goals for this week at [url]"

**Day 9:** "Make a healthy plate. Fill 1/2 with vegetables, 1/4 with whole grains, 1/4 with lean protein."

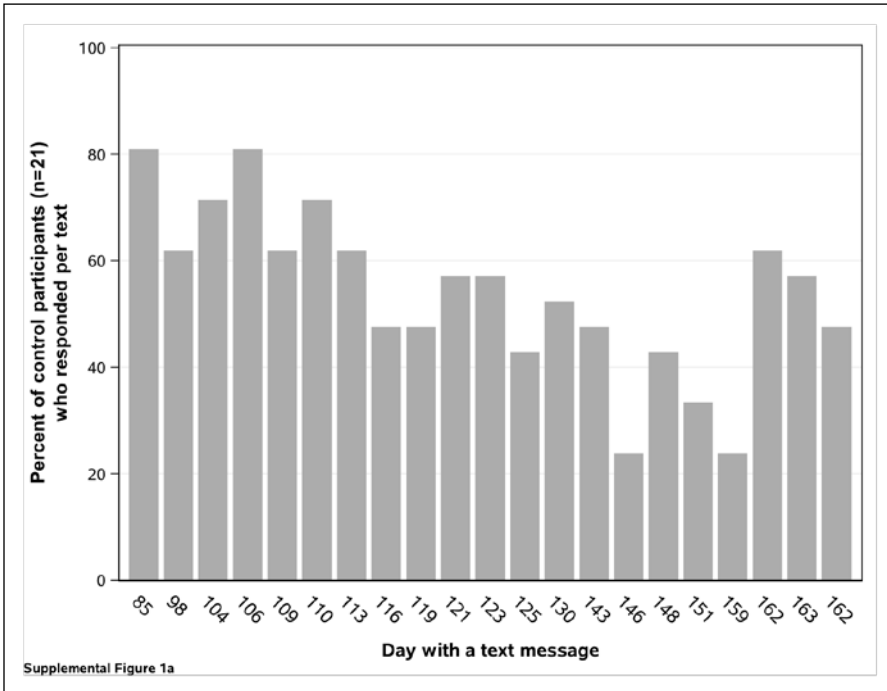
**Day 10:** "Use measuring cups and spoons and a kitchen scale to learn portion sizes. Soon you'll be a pro and can eyeball it!"

**Day 11:** "Looking for healthy beverage ideas? Try sparkling water with a splash of juice. Get more recipes for special occasions at: [url]"

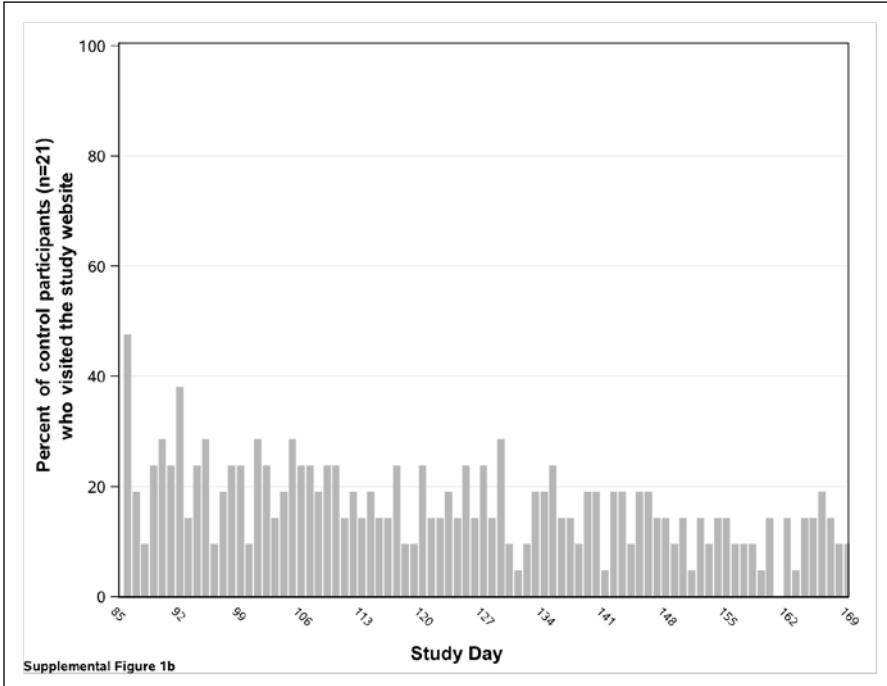
**Day 12:** "Choose whole over refined grains. A high glycemic load (high refined grains) is associated with a 2-fold higher risk of death among colon cancer survivors."

**Day 13:** "Sweetened beverages include soda, punch, lemonade or other fruit drinks, and sports drinks. Coffee, tea, or mixed alcoholic drinks can also have a lot of added sugar."

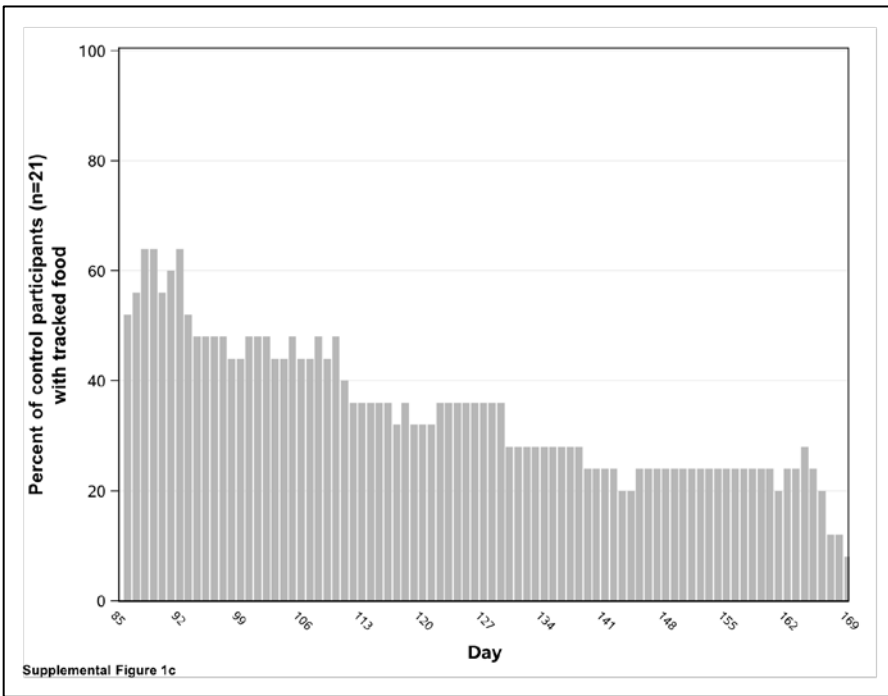
**Day 14:** "Hello. Do you know how you are going to get your 5+ servings of vegetables tomorrow? Text back 'Y' or 'N'.",  
"**y-yes**": "Great! Planning ahead is key to success!",  
"**n-no**": "Make a plan now for incorporating vegetables in your meals and snacks tomorrow. You can do it!"



**Figure S2a.** Percent of participants in control group who elected to receive the intervention from Weeks 12-24 (n=21) who responded to each text message that asked for a reply.



**Figure S2b.** Percent of participants in control group who elected to receive the intervention from Weeks 12-24 (n=21) who went to the study website, by study day.



**Figure S2c.** Percent of participants in control group who elected to receive the intervention from Weeks 12-24 (n=21) who tracked intake of the target food groups, by study day.

**Table S2.** Feedback from people with colorectal cancer on a 12-week daily text message program promoting healthy eating for colorectal cancer.<sup>1</sup>

**Frequency and Timing**

“They are good. They are just too early in the morning.”

“They were good, I would just add do them more often.”

“Maybe 2-3 texts a day will help me be more involved with the selection of what I eat.”

“feedback from family and friends may be more effective than texting. texting seemed too much and got lost”

“Morning is best. (I had opted for evening and by the time I received the message I was finished eating for the day).”

“I wouldn't have minded receiving text messages twice a day.”

“Daily is the right cadence”

“Keep the same.”

“More frequent, maybe three times per day.”

“Daily was good at the beginning. I think there should be periodic breaks for a few days to keep us from getting too tired of the daily messages.”

“Once a day is fine. What might be cool is to be able to schedule texts on demand, for example, if I'm going to a party, have the system ping me at 9:00pm and tell me to watch what I'm eating.”

I think one per day is fine. Any more and it would be too much.

leave as is, works perfect and at the right time in the morning.

probably one before lunchtime and another before dinner would help more

**Content**

“I found the messages very motivational. I could have used more direction with trying different grains and vegetables. I did increase my intake though.”

“More current statistics on diet and eating habits. Include URL for more detailed information that may be available on Internet.”

“I loved the encouragement and motivation. The daily reminders kept me accountable. Add links to diet edu or gov sites.”

“Maybe add a food-specific tip each day (like “Try adding sliced banana to your steel cut oatmeal.”) Or a link to a “Recipe of the Day” with shopping list. I found I was too lazy to go to the website and explore new recipes.”

“The content is basic information. Is there more you can provide, like making more in-depth recommendations?”

“Encourage a particular goal. For example, “today concentrate on eating 5 servings of vegetables””

“maybe include a really quick recipe in there.”

“send links to useful sites or pages. Te[x]ting is not always the best way of dealing with complex topics such as health.”

“The “scary” ones were the most effective for me, i.e., “consumption of sugared drinks on a daily increased recurrence of cancer by x%””

“Perhaps add links to articles about health”

“You should provide examples of diets, what someone would eat during the day. Not numbers of servings, but specific foods/recipes.”

“Not sure - they were good, but felt like I already knew (or was following) the advice. They seemed pretty focus on things I should be doing. Might be good/motivating to mix in more about why I should be doing it.”

“More advise on how to work in vegetables/grains into breakfast and snacks, menu ideas”

“There was a pretty good blend of educational, motivation and suggestive content. Not much in negative reinforcement (e.g. eat better or you will relapse; do you really want to go thru chemo again?) Wonder what a psychologist would say about the mix of content given the goal is to change deeply rooted bad behaviors”

“When information is provided, maybe include a link to additional information

"Maybe adding more of a coping with ____ cravings aspect instead of eating/consuming this, try this healthier alternative..."
"Adding links to messages (e.g. consuming healthy fats does this for your body, etc)."
"Maybe more suggestion of different foods and recipes."
"with some emojis would make them more fun to read. make it more fun, including some pictures"
<b>Tailoring/Personalization</b>
"Messages more focused on the particular demographic of the recipient, messages seemed aimed at people with leisure time for shopping and preparing multi-person meals – not so helpful to working singles."
"The language was impersonal."
"New information. What was sent wasn't new for me so wasn't very motivational."
"Have it be done by a person, not a computer, with responses available."
"I don't eat sweetened beverages or processed and red meats so it would be great to tailor some of the messages if I select what I am already good at."
"RESPOND TO MY TEXT"
"include some messages of encouragement that I'm meeting goals"
<b>Interactive Texts</b>
"I liked the limited interactivity of it. It gave me the freedom to interact without feeling the burden of judgement."
"I enjoyed the mix of informational texts along with those that polled you. The polling questions made me feel more engaged and i would take time to reflect on the changes I was making or areas I needed to put more effort into."
"I liked the content and the variety – such as facts, challenges and quizzes."
"I like answering questions and getting immediate feedback."
<b>Complimentary</b>
"Perfect as is."
"Pretty much on target."
"I like them and they are helpful so I really cant think of any good reason to change it."
<b>Negative</b>
"Doesn't work for me."

<sup>1</sup> Participants were asked the following open-ended questions: "How can we improve the content of the text messages?" and "What feedback do you have about the text messages? Anything you think we should change?"

**Table S3.** Anthropometrics and metabolic circulating biomarkers at baseline and 12 weeks among individuals with colorectal cancer participating in a digital health dietary intervention.

	Median [IQR]				Difference in means (95% CI) <sup>1</sup>
	Intervention		Controls		
	Enrollment	Absolute change	Enrollment	Absolute change	
N <sup>2</sup>	25	22	23	20	
Body mass index (kg/m <sup>2</sup> )	26.9 [24.4,29.5]	0.2 [-0.1 ,0.5]	25.5 [22.8,32.1]	0.1 [-0.4, 1.4]	-0.3 (-1.0, 0.4)
Weight (pounds)	161 [142,193]	2 [-1.6, 3.7]	176 [134,219]	2.1 [-1.4, 5.8]	-2.1 (-5.9, 1.8)
Waist circumference (cm) <sup>3</sup>	38 [31,41]	-1 [-2, 2.5]	35 [33,44]	-0.1 [-1, 1.5]	-1.3 (-5.2, 2.6)
Systolic blood pressure (mmHg)	126 [115,136]	-5 [-9, 7]	124 [113,138]	3 [-3, 8]	-7 (-14, 1)
Diastolic blood pressure (mmHg)	73 [66,82]	-1 [-5, 4]	75 [70,87]	2 [-5, 7]	-2 (-9, 6)
C-reactive protein (mg/L)	1.4 [0.6,2.7]	-0.2 [-0.6, 0.2]	0.8 [0.4,2.8]	0 [-0.5, 0.6]	-1.1 (-2.5, 0.2)
Hemoglobin A1c (%)	5.6 [5.2,5.7]	-0.1 [-0.2, 0.1]	5.4 [5.2,5.6]	0 [-0.1, 0.1]	-0.1 (-0.2, 0.1)
Fasting glucose (mg/dL)	96 [87,99]	0.5 [-7.5, 6.5]	89 [85,99]	2 [-2, 10]	-2.5 (-8.4, 3.4)
Total cholesterol (mg/dL)	212 [188,239]	-13 [-19, 7]	199 [167,240]	-4 [-15, 12]	-4 (-20, 12)
High-density lipoprotein (mg/dL)	65 [56,73]	0.5 [-3, 3]	68 [53,80]	0 [-6, 5]	0.7 (-4.2, 5.7)
Low-density lipoprotein (mg/dL)	122 [102,147]	-13 [-23, 7]	95 [77,127]	5 [-7, 18]	-16 (-40, 7)
Triglycerides (mg/dL)	102 [83,118]	-17 [-26, 7]	85 [68,126]	5 [-24, 29]	-18 (-45, 9)

<sup>1</sup> Difference in means is intervention group minus the control group.

<sup>2</sup> Two participants (both randomized to control arm) opted not to go to LabCorp at enrollment. At 12 weeks, 21 intervention participants had data on BMI, weight, waist, and glucose; 18 control participants had data on BMI, weight, waist, systolic blood pressure, diastolic blood pressure; and 19 control participants had data on glucose levels.

<sup>3</sup>Waist circumference was taken at the umbilicus with paper tape measures.