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# A Remote Diet and Exercise Intervention for Surgical Patients With Prefrailty and Frailty During the COVID-19 Pandemic


**Abstract:** Objectives: *To facilitate the success of surgical patients with prefrailty and frailty in meeting diet and exercise goals in the context of the COVID-19 pandemic, and to encourage patient satisfaction with remote care.* Methods: *In the setting of the COVID-19 pandemic, surgical patients with prefrailty and frailty were offered remote visits with a geriatrician and a remote diet and exercise coaching program.* Results: *The coaching participants set a mean of 37 ( $\pm 15$ ) individualized dietary goals and 17 ( $\pm 11$ ) individualized exercise goals. 75% of the coaching participants met at least 65% of their dietary goals and 75% met at least 50% of their exercise goals. All patients met at least one diet goal and at least one exercise goal. Patients endorsed high levels of satisfaction with the program.* Discussion: *Diet and exercise interventions for surgical patients with prefrailty and frailty have potential for adaptation to remote formats. Such interventions may facilitate patients' meeting of individualized diet and exercise goals and may also encourage patient satisfaction.*

**Keywords:** Frailty; surgery; diet; exercise; COVID-19

## Introduction

Frailty is “a geriatric syndrome in which a patient is more vulnerable to stressors due to decreases in physical function and reserve.”<sup>1</sup> It has been found to be

Patients with prefrailty, or characteristics suggesting increased risk for frailty, may also be at increased risk of poorer outcomes.<sup>5-7</sup> Interventions for surgical patients with prefrailty and frailty may improve their perioperative courses and their longer-term frailty trajectories.<sup>4,8,9</sup> Interventions for these patients have addressed physical activity, nutrition,

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predictive of adverse outcomes, including disability, hospitalization, institutionalization, and mortality.<sup>2</sup> Patients with frailty are more vulnerable to stressors, such as surgery, and it has been found that surgical patients with frailty have an increased risk of postoperative complications, functional decline, readmissions, and mortality.<sup>3-7</sup>

memory/cognition, mental health, and combinations of these.<sup>4,8,9</sup>

The COVID-19 pandemic appears to have worsened the trajectories of patients with frailty.<sup>10,11</sup> Factors contributing to this may include social isolation, decreased physical activity, poor eating habits, decreased access to services/interventions, and COVID-19 illness

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itself.<sup>11</sup> Patients experiencing these factors may have decreased energy levels, declines in emotional health, decreased satisfaction with their healthcare, and worsened frailty statuses.

## Methods

### Context

The FIT SURG clinic is an IRB-approved quality improvement initiative in a large Veterans Affairs healthcare system that identifies surgical and interventional cardiology patients with prefrailty and frailty and provides relevant supports. Interventions provided prior to the COVID-19 pandemic included discussion of medical comorbidities and medications with a geriatrician, educational discussions about diet and exercise, provision of exercise books and materials, instruction on a structured home exercise program designed for patients with frailty, and referrals to dietitians, physical therapy, occupational therapy, recreation therapy, memory clinic, falls clinic, incontinence clinic, social work, and psychology.

Patients were identified as having prefrailty or frailty, and therefore being eligible for voluntary participation in the FIT SURG clinic, through preoperative geriatric assessments incorporating phenotypic and deficit accumulation approaches to frailty evaluation. Phenotypic frailty assessments were based on presence of unintentional weight loss, low grip strength, low gait speed, decreased energy level, and/or decreased activity level.<sup>12</sup> Presence of 0 out of these 5 parameters was considered to suggest robust status; presence of 1 or 2 parameters was considered to suggest prefrailty; and presence of 3, 4, or 5 of these parameters was considered to suggest frailty. In the deficit-accumulation evaluations for frailty, a 24-item Rockwood-inspired modified frailty index was used, incorporating comorbidities, functional abilities, and physical parameters.<sup>13</sup> Scores  $\leq .10$  were considered to suggest robust status, scores  $>.10$  and  $\leq .20$  were considered to suggest prefrailty, and scores  $>.20$  were considered to suggest

frailty. When there was a disagreement between the phenotypic frailty assessment and the deficit accumulation method as to whether the patient had robust status or prefrailty/frailty (7 patients), we referred to results from the BioSensics Frailty Meter, Clinical Frailty Scale, and/or clinician judgment in the setting of overall geriatric assessment for further determination of frailty status.<sup>14-17</sup>

### Intervention

In March of 2020, in the setting of the early stages of the COVID-19 pandemic, we initiated a new Plan-Do-Study-Act cycle in the FIT SURG project.<sup>18</sup> We recognized that new elective surgeries were being postponed due to the pandemic, that it was important to offer remote visits to established patients, and that our patients had been having limited engagement with the structured home exercise program we had been teaching them during clinic visits. We decided to proceed with offering an adapted version of our clinic involving remote visits with a geriatrician and the added availability of remote diet and exercise coaching visits with an experienced health coach. The geriatrician visits included discussion of COVID-19 precautions, review of medical problems and medications, assessment of statuses of geriatric syndromes, and offering relevant interventions, including remote diet and exercise coaching. Follow-up continued with the patients' established primary care providers, and the patients were aware that the FIT SURG visits were not intended to replace primary care.

Remote visits with the geriatrician were offered to FIT SURG patients who were waiting for elective surgeries or who were at least 30 days post-op after elective surgeries. Diet and exercise coaching was offered to patients who were identified by the geriatrician as having physical and cognitive statuses that were congruent with safe participation in remote coaching, without the need for involvement by a caregiver. Exclusion criteria included major neurocognitive disorders, extensive fall histories, unstable cardiac syndromes, severe obstructive cardiac disease,

proliferative diabetic retinopathy, and oxygen dependence. The clinic team was careful to be aware of and accommodate any specific nutrition or physical activity needs of patients, including any continued post-operative restrictions. We included patients of any age, as prefrailty and frailty have been associated with worse outcomes among patients over as well as under age 65, and out of concern that the conditions of the COVID-19 pandemic could worsen outcomes for a broad range of patients.<sup>5,6,19</sup>

The diet and exercise coach initially enrolled each participating patient in 16 weeks of coaching. The first 4 weeks had weekly coaching visits, and the remaining 12 weeks had coaching visits every other week. Due to positive feedback from patients about the program, patients' success in reaching individualized diet and exercise goals, and the continued need for remote interventions in the setting of the COVID-19 pandemic, the iterative step was taken of offering patients the opportunity to extend the program for an additional 8 weeks.

The diet coaching program was based on the Mediterranean diet, with the added option of setting goals related to sufficient protein intake. Examples of individualized diet goals included, "avoid drinking soda," "replace sweets with healthier options," "eat vegetables at least 3 times a week," "replace white bread with whole grain bread," and "replace fried foods with healthier options." Physical activity goals often involved walking in areas that allowed for social distancing, using equipment patients had at home (such as exercise bands that had been issued previously in clinic), and/or using home exercise videos provided by the coach. Examples included "go for walks at least three times a week," "use the exercise bands (as discussed) at least three times a week," and "go for bicycle rides at least two times a week." Gradual stepwise increases in the duration and frequencies of workouts were encouraged. Participants had contact information for the diet and exercise coach and the FIT SURG geriatrician, in

**Table 1.**

Demographics of coaching participants (n = 26).

	Number of Participants (Percentage)
<b>Gender</b>	
Male	25 (96.2%)
Female	1 (3.8%)
<b>Age</b>	
50–59 years	4 (15.4%)
60–69 years	13 (50.0%)
70–79 years	9 (34.6%)
<b>Race/Ethnicity</b>	
White/Non-Hispanic	10 (38.5%)
White/Hispanic	5 (19.2%)
Black/Non-Hispanic	10 (38.5%)
Black/Hispanic	1 (3.8%)
Asian/Pacific-Islander	0 (0%)
Native American	0 (0%)

case of any questions or concerns arising as they worked on meeting their health goals.

### Evaluation

With the permission of our IRB, the diet and exercise coach tracked patients' individualized goals and their progress toward meeting them in REDCap, a secure web application in which databases can be built and managed behind firewalls. This information was continually discussed with patients and was used for assessment of the program's effectiveness, which contributed to the decision to extend the duration of the diet and exercise coaching as described above. After the completion of the "extension" period of diet and exercise coaching, we administered a patient experience survey to the patients who had participated in the extended duration of coaching. The survey was not offered to the patients who had chosen not to complete the extension of

the coaching program, as we had received verbal feedback from some FIT SURG patients that although they enjoyed and appreciated the FIT SURG program, they felt that in the context of the pandemic they were receiving a high total volume of phone calls from our institution. (These patients had not specifically mentioned the coaching component of FIT SURG.) (Table 1).

### Statistical Analysis

The diet and exercise goals were summarized by descriptive statistics including mean, standard deviation, median, and range (Table 2).

### Results

The diet and exercise coach offered the coaching program to 47 patients, and 26 of these patients chose to participate in it. At the end of the initial 16-week period of coaching, 19 patients chose to participate in the extension of the

program for an additional 8 weeks. The mean age of FIT SURG patients who participated in diet and exercise coaching was 67 years, and the range of ages was 54 to 76 years. Twenty-five patients were male and 1 patient was female. All patients had prefrailty or frailty as determined by preoperative geriatric assessments incorporating phenotypic and deficit accumulation approaches to evaluation for frailty, as described above. Five patients were in the preoperative period when they completed the coaching program, and 21 patients were in the post-operative period. All patients in the post-operative period were at least 30 days post-op, and many were 90 days or more post-op at the time of their first coaching session. All post-operative patients were within the first year after surgery. All surgeries were elective, and included orthopedic (10), general (8), urologic (5), thoracic (2), and vascular (1) surgeries. The most common surgeries were joint replacements (9), abdominal surgeries (8), and prostatectomies (3). In accordance with patient preference, most coaching visits were conducted by telephone and the remainder by video. No falls, unexpected medical visits, or other adverse events were reported in association with patients' exercise.

The coaching participants set a mean of 37 ( $\pm 15$ ) individualized dietary goals and 17 ( $\pm 11$ ) individualized exercise goals (Table 2). 75% of the participants met at least 65% of their dietary goals, and half of them met at least 75% of their dietary goals. 75% of the coaching participants met at least 50% of their individualized exercise goals, and half of them met at least 58.9% of their exercise goals. All patients met at least 1 diet goal and at least 1 exercise goal.

The FIT SURG geriatrician frequently discussed the diet and exercise coaching process with patients, and in these discussions all patient feedback on the coaching process was entirely positive. In the patient satisfaction survey that was administered to participants who completed the extended, 24-week duration of coaching (as described in "Methods" above), all patients either

**Table 2.**

Coaching participants' accomplishment of diet and exercise goals.

	Mean ± SD	Median	Range
Number of diet goals	37 ± 15	40	10–60
Diet goals met (%)	71.6 ± 16.6	75	10–93.3
Diet goals partially met (%)	15.7 ± 6.7	16.0	3.3–25.8
Diet goals not met (%)	12.7 ± 16.3	7.1	0–80
Number of exercise goals	17 ± 11	14	1–39
Exercise goals met (%)	60.0 ± 26.0	58.9	0–100
Exercise goals partially met (%)	11.6 ± 13.3	7.4	0–50
Exercise goals not met (%)	28.5 ± 24.9	24.6	0–100

strongly agreed (75%) or agreed (25%) that the information received during the coaching visits was useful. All patients either strongly agreed (69%) or agreed (31%) that the health coach had improved their VA experience as they practiced social distancing. All patients either strongly agreed (81%) or agreed (29%) that the coaching program helped them feel that they had social support during the COVID-19 pandemic. In the survey, patients expressed higher levels of engagement and satisfaction with telephone than video visits. All patients either agreed (62.5%) or strongly agreed (37.5%) that they enjoyed the telephone visits. 25% of patients expressed strongly agreeing or agreeing that they liked the video visits, while 19% were neutral regarding this, and 56% indicated that it was not applicable to them.

### Conclusion

The COVID-19 pandemic has brought new challenges and stressors for surgical patients with prefrailty and frailty, posing concerns for their short-term as well as longer-term outcomes. In the experience of our quality improvement program for surgical patients with prefrailty and frailty, the use of remote diet and exercise coaching was feasible and safe. Most patients met at least half of their

individualized diet and exercise goals, and all patients met at least 1 diet goal and at least 1 exercise goal. Patients expressed higher levels of engagement and satisfaction with telephone than video visits, but 25% of patients did use and like the video format. Overall, patients expressed high levels of satisfaction with health coaching, with all patients endorsing that it improved their VA experience and helped them feel that they had social support as they practiced social distancing during the pandemic.

### Authors Contributor

Shriya Airen (Medical Student at University of Miami Miller School of Medicine) made valuable contributions in the editing process.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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