



# Reducing Food Insecurity through Personalized Interventions at the East Harlem Health Outreach Partnership

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## Abstract

**Background:** An individualized food insecurity protocol is defined as a comprehensive process of screening and set of interventions designed around the specific needs of an individual patient including but not limited to such factors as work schedule, place of living, and forms of identification. The aim of this project is to identify whether an individualized food insecurity protocol reduces food insecurity in the patients seen at the East Harlem Health Outreach Partnership (EHHOP), a student-run, attending-directed free clinic in East Harlem.

**Methods:** Twenty-one patients who had screened positive for food insecurity in the past year were enrolled in the study. Pre- and post-intervention scores based on responses to a modified version of the United States Department of Agriculture's Six-Item Short Form of the Food Security Survey were recorded, compiled as aggregate data, and compared using the Wilcoxon signed-rank test.

**Results:** The results of this study demonstrate that an individualized protocol was successful in reducing food insecurity ( $p = 0.005$ ). However, for certain groups, the protocol was not as effective, including patients with poor continuity of care and unstable living conditions.

**Conclusions:** These results showed that the individualized protocol was effective for many but not all participants. Patients may have compounding factors that require additional interventions to supplement this protocol. This protocol is low cost to implement and adaptable to other clinical settings.

## Introduction

The East Harlem Health Outreach Partnership (EHHOP) is student-run, attending-directed free clinic that provides primary care services for uninsured adult residents of East Harlem, New York. The clinic is set up as an interdisciplinary practice setting with medical students from Icahn School of Medicine at Mount Sinai working alongside allied health professionals from Mount Sinai Hospital comprised of social workers, physicians, and nurse practitioners. In spring of 2016, a preliminary survey of patients demonstrated a high prevalence of "food insecurity", as defined by United States Department of Agriculture (USDA) measures outlined below. This original survey was performed by medical students during clinical encounters in 2016 using the USDA Six-Item

Short Form of the Food Security Survey<sup>1</sup> to determine the level of food insecurity present on a scale of 1 to 5; an estimated 12% of the total patients at EHHOP were food insecure. A second and more robust survey that captured a larger and more representative group of the EHHOP patient population, administered by senior and junior medical students in June 2016, found that approximately 20% of EHHOP patients were food insecure. Furthermore, these surveys supplemented anecdotal evidence that food insecure patients were not being aided by general clinic referrals to food pantries and soup kitchens due to a host of psychosocial barriers including, but not limited to, (1) difficult work schedules, (2) mobility problems, (3) lack of identification, (4) unstable housing arrangements, (5) limited financial resources, (6) insufficient amount of food

provided, and (7) the type of food being provided (e.g. perishable groceries given to a patient with no means of cooking or storing them).

Previous studies have shown that food insecurity in non-senior adults (18 - 65 years old) is correlated with increased rates of mental health problems, diabetes, hypertension, and other adverse health outcomes.<sup>2,3</sup> Adequate treatment of food insecurity, however, has remained elusive and may not be as easy as simply connecting patients to resources as documented in previous studies. A 2019 study in a safety net diabetes clinic showed that “that screening for food insecurity followed by a list of food resources for those screening positive may not adequately address patient barriers to using community-based food resources”.<sup>4</sup> A prior study at the University of San Diego demonstrated significant rates of food insecurity in their student-run clinic populations and attempted to overcome the barrier to alleviating food insecurity by instituting a referral process to get patients enrolled in public benefits.<sup>5</sup> However, this study did not document actual improvement in food insecurity from the suggested referral system; rather, the effect was measured using referral completion as a proxy.<sup>5</sup>

Based on the prior surveys conducted in EHHOP and the current body of evidence in the literature, it is clear that food insecurity is a sizable and clinically important problem for our patient population that has prominent effects on both quality of life and well-being.<sup>6-8</sup> This project was designed to determine if an individualized food insecurity protocol, with food resource recommendations tailored to patients’ needs, could significantly lower directly measured food insecurity in the EHHOP patient population by more comprehensively addressing known psychosocial barriers to free and low-cost food access.

## Methods

### *Food Insecurity Screening and Intervention*

Starting in June 2016, two different student groups were employed to administer (1) a food insecurity screen, (2) a more robust food insecurity questionnaire for patients who tested positive, (3) a tailored intervention that specifically addressed individual obstacles to accessing community-based food resources (Figure 1).

Student clinicians who care for patients in the clinic under the direct supervision of an attending physician screened each patient for food insecurity at their medical appointments with the

following two statements which have been shown to be 97% sensitive, are the first two survey items of the USDA 12-question survey for food insecurity, and are supported by the American Academy of Pediatrics for family-based food insecurity screening at healthcare visits<sup>9,10</sup>:

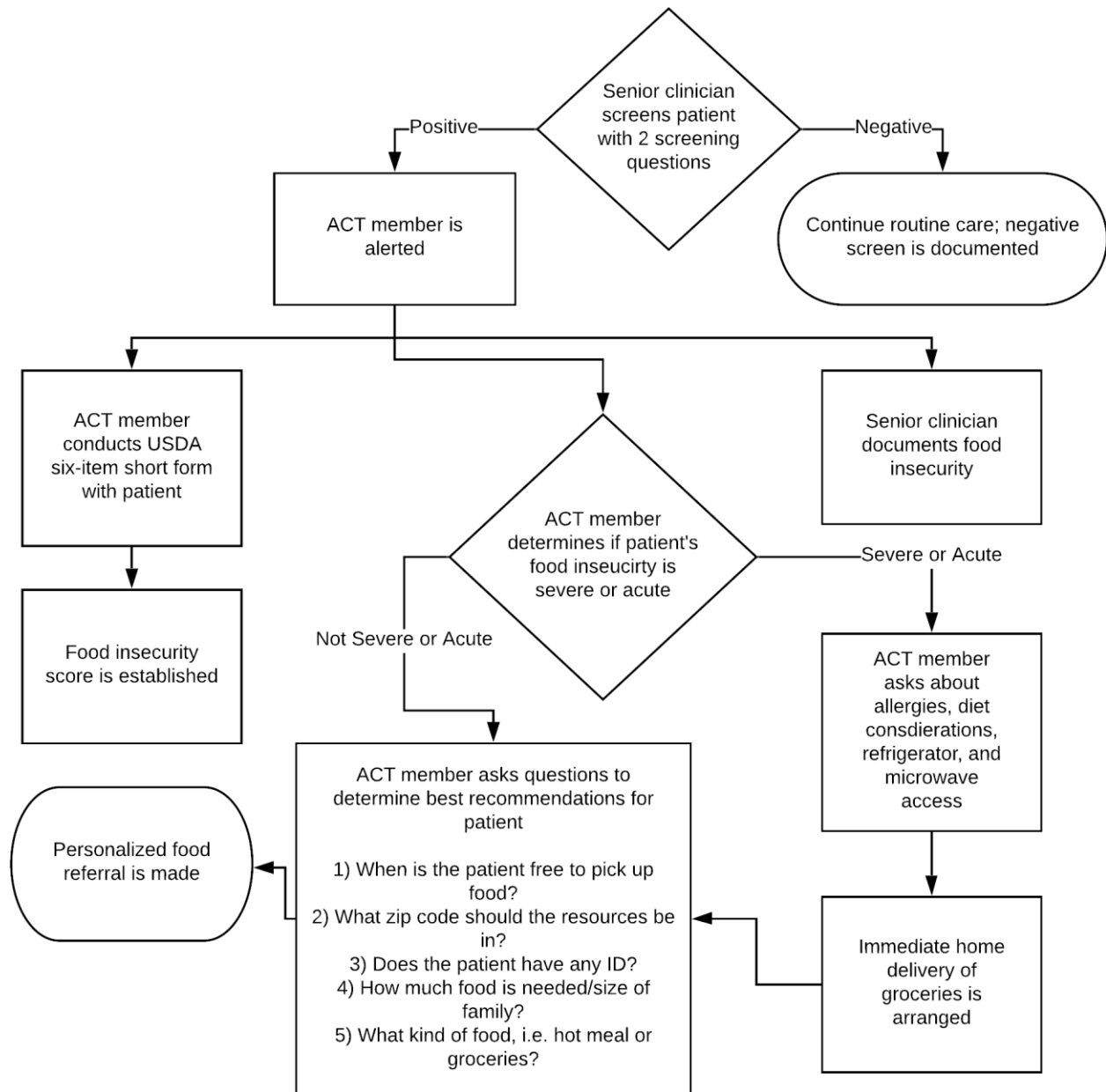
1. Within the past 12 months, we worried whether our food would run out before we got money to buy more.
2. Within the past 12 months, the food we bought just didn’t last and we didn’t have money to get more.

These first two questions were used to screen patients in or out of the protocol. If they responded “No” to both questions, care was continued without additional intervention. If the patient answered “Yes” to either or both of the prompts, the protocol was engaged and Access-to-Care Team (ACT) students, who are trained to advocate and link patients to hospital and community resources as a routine part of the EHHOP clinic, were alerted and administered the USDA Six-Item Short Form of the Food Security Survey to further characterize the patient’s food insecurity. The ACT student then provided the patient with personalized resources to access food using the tools described below and informed the clinical team of any recommendations.

ACT members were further trained as part of this study to provide patients an individually-tailored plan to address food insecurity. Their tools included a spreadsheet of local food pantries and kitchens that were stratified by convenience variables such as weekend and night hours, location, reduced identification requirements, amount of food provided in a week, limits on the length of time for utilization of a service, hot meals versus brown bag lunches/groceries, and other specialty criteria. The data in this spreadsheet was obtained by surveying local food pantries and kitchens over the phone with standardized language focused on these variables.

Additionally, ACT members were given access to a fund provided by the Mount Sinai Auxiliary Board which could be used to send a week-long supply of food, adjusted to family size, through a local delivery service to a patient’s home if the patient was found to have “severe food insecurity” or “acute food insecurity.” Severe food insecurity was defined by a low BMI score (<18) or food insecurity with poor mobility (i.e. homebound or significantly disabled). Acute food insecurity was a

**Figure 1.** Process Map of Intervention Study



ACT: Access-to-Care Team; USDA: United States Department of Agriculture; ID: identification

category reserved for patients who had not had a meal in two days or more. These definitions were determined with input from attending physicians and nutritionists working at EHHOP to address urgent cases. All patients receiving a grocery delivery or who were acutely or severely food insecure were additionally screened both for allergies and access to a microwave and

refrigerator. The groceries delivered were designed with input from patients and a licensed nutritionist employed by the EHHOP clinic and contained Heart Healthy, diabetic-friendly, soft food, and culturally appropriate options when required (see Appendix 1 for examples of grocery lists).

All patients who received a targeted intervention also engaged in individualized follow-up that occurred weekly both in person and over the phone from their ACT student to assess use of provided resources and to counsel on alterations as appropriate, which could include recommending additional food pantries/kitchens, ensuring delivery of groceries, and troubleshooting any problems the patients may have encountered in the process.

### *Evaluating Outcomes*

Patients were eligible for the study if they had documented food insecurity. Eligible participants were identified by EHHOP Electronic Medical Record (EMR) chart review for positive food insecurity screens within a year prior to the start of the study. All patients with EMR evidence of food insecurity were called and attempted to be enrolled. Additionally, patients new to the clinic that were revealed to have food insecurity in their intake visit were also included in the study. The enrollment period lasted for 3 months for both patients with newly discovered food insecurity and for reaching out, reassessing, and enrolling historically food insecure patients. Patients were excluded if they terminated care at EHHOP. Consent was obtained over the phone using standard Mount Sinai consent language and the use of interpreters as needed. No compensation was provided for participation.

From October to December of 2016, enrolled patients were called and asked a series of questions using a modified version of the USDA Six-Item Short Form of the Food Security Survey to establish pre- and post-intervention scores (Appendix 2). The calls to establish the pre-intervention scores were made within 1 week of enrollment and asked the patients to answer the questions based on their experience prior to receiving help. The post-intervention calls were made within 3 months of the patients being enrolled. The USDA Six-Item Short Form was modified slightly for the purposes of this study; specifically, the time frame was changed from 12 months to 30 days to better account for the effect of the intervention. Each participant produced two scores on a Likert scale of 0 to 5, with 0 being “no food insecurity” and 5 being “severe food insecurity”. The composites of these scores were then analyzed using a Wilcoxon signed-rank test to determine if there was a statistical difference between the pre-intervention and post-intervention score distributions. A Wilcoxon signed-rank test was

chosen because the population could not be assumed to be normally distributed and the data was paired. This test was conducted using SPSS statistical software version 22.

Based on informal qualitative analysis of the narratives collected during surveys of enrolled patients, several possible themes emerged that may have potentially impacted the effectiveness of the intervention. These themes included housing stability and consistency of clinical care. Post hoc analysis of the data was then conducted by splitting the participants into cohorts stratified by the aforementioned themes—a participant was sorted into the “unstable living situation” cohort by having documentation of one or more incidences living in a shelter, halfway home, or other non-permanent living situation, or being homeless within 6 months of the intervention. A participant was sorted into the “poor consistency-of-care” cohort if he/she had missed 2 or more appointments within 6 months of the intervention. These sub-groups (stable versus unstable living situation and poor versus good consistency-of-care) were then analyzed using a Wilcoxon signed-rank test to determine if there was a statistical difference between the pre- and post-intervention scores after controlling for those respective factors.

This research was approved by the Institutional Review Board of the Icahn School of Medicine at Mount Sinai.

## **Results**

Forty-two patients were found to be eligible to participate in the intervention and 21 were enrolled. Of the 21 patients enrolled in the study, 12 (57%) were female and 9 (43%) were male. All of the patients in the study were adults between the ages of 25 and 74 with a mean age of 47 years (Table 1).

The number of patients that screened positive for food insecurity (score  $\geq 2$ ) after the intervention ( $n = 9$ ) was half that of pre-intervention levels ( $n = 18$ ). The results of the Wilcoxon signed-rank test showed a significant decrease in the post-intervention food insecurity scores as compared to the pre-intervention scores ( $p = 0.005$ ).

When the groups were controlled for living conditions, the difference in pre- and post-intervention scores persisted in the stable living situation ( $p = 0.008$ ) but disappeared in the unstable living situation group ( $p = 0.317$ ) (Figure 2). Ad-

**Table 1.** Demographics and Raw Food Insecurity Scores

Characteristic	N = 21
Age, mean years (SD)	46.7 (11.1)
Female, n (%)	12 (57.1)
Unstable living situation, n (%)	6 (28.6)
Poor consistency-of-care, n (%)	4 (19.1)
Pre-intervention scores	
mean (SD)	3.6 (1.7)
median (IQR)	4 (3-5)
Post-intervention scores	
mean (SD)	2.0 (2.2)
median (IQR)	1 (0-4)

SD: standard deviation; IQR: interquartile range

ditionally, when the groups were controlled for consistency-of-care, the difference in pre- and post-intervention scores in the good consistency-of-care group persisted and was significant ( $p = 0.005$ ) but was lost in the poor consistency-of-care group ( $p = 1$ ) (Figure 3).

### Discussion

This study demonstrated that a personalized approach to resolving food insecurity lowered levels of food insecurity by 50% in our study population. The mechanism of this intervention focused on acknowledging and appropriately accounting for patient-specific barriers to accessing food resources including identification requirements, hot meals versus brown bag lunches/groceries, weekend and night hours, and location and providing each identified patient with a specific ACT member to follow up and guide them through this process. By creating this robust and personalized protocol, EHHOP was able to partner with its patients to improve their access to food resources.

However, this study also revealed that despite the overall success of this intervention, there were certain populations for which it was not demonstrably helpful. These groups, specifically those with unstable housing and poor consistency-of-care, did not benefit from the personalized intervention protocol. We hypothesize that this lack of benefit is a sign that the protocol in its current form is successful mostly when the patient's food insecurity is a relatively isolated problem and that the protocol fails if the food insecurity exists in the context of a larger, more complicated set of socioeconomic barriers including housing instability

and poor clinical follow-up. This suggests that the protocol could be improved by adding an extra layer of screening and support for patients that fall into these vulnerable groups and subsequently performing a follow-up study to determine the efficacy of these additions. Such changes could include involving social workers, building partnerships with shelters around the city, or more aggressive follow-up. That being said, we did witness some success even with patients who did fall into these categories (Appendix 3).

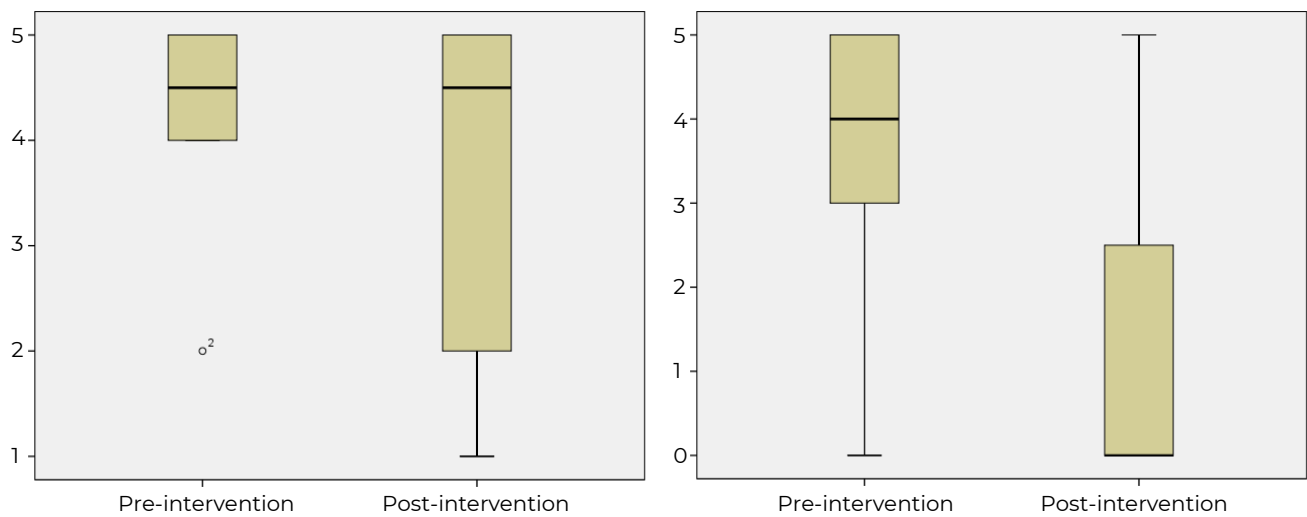
### Implications for Practice

This intervention is low cost (<\$500 for all 21 patients enrolled), easy to implement, and easily modified for local need. The only cost associated with the intervention described in this study is for the grocery deliveries for acutely or severely food insecure patients, which only accounted for 19% of the enrolled patients in the study (4 of 21). Instituting the protocol for each acutely or severely food insecure patient cost, on average, \$80 per patient. There were some patients for whom more than one emergency food delivery was required, generally patients with more complicated socioeconomic situations as described above, and for whom food insecurity was persistent, but those patients were followed by the ACT team indefinitely and continued to receive support and care as appropriate. The benefit identified in this study is derived not from developing internal resources but from a thoughtful, patient-centered process that focuses on successfully connecting patients with existing community resources. As such, this process is generally applicable, and could be replicated in any community clinic that aims to implement a high-yield partnership with local food resources for disenfranchised persons. Additionally, this type of intervention fits naturally into "high labor, low resource" clinical settings which is characteristic of many student-run free clinics (i.e. a setting with many free volunteers but little financial capital). It is the hope of the authors that this study will spur other student-run clinics to explore similar options for addressing food insecurity and other critical issues for patients with the same community-centered and patient specific focus.

### Future Research

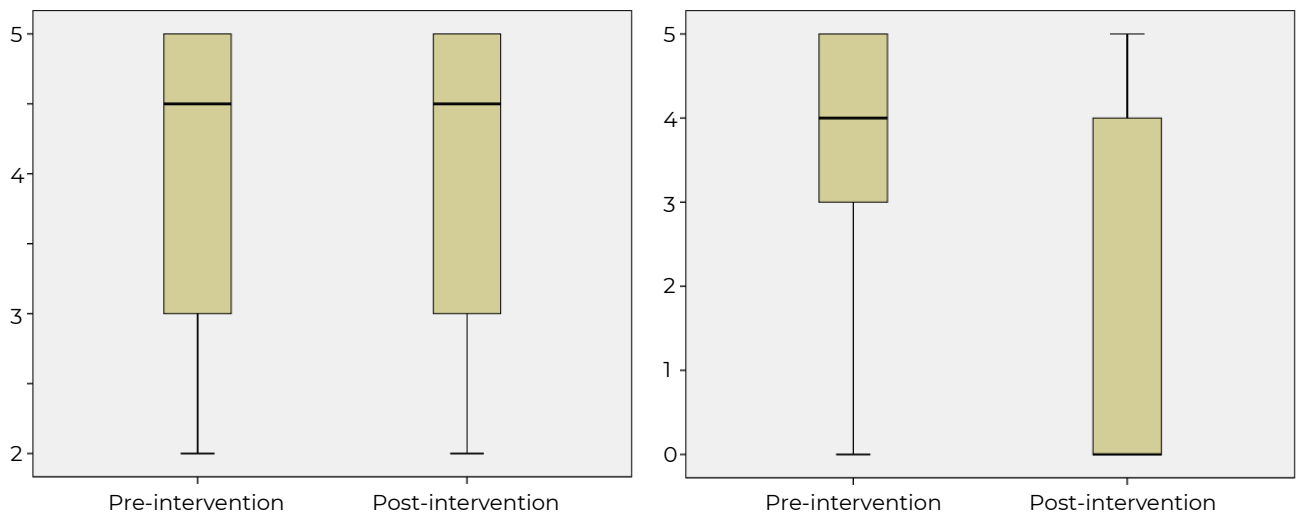
Possible future research could include an assessment of the longevity of the benefit of this intervention and measure food insecurity scores a

**Figure 2.** Pre- and Post-Intervention Food Insecurity Scores from Stable Living Situation Cohort (Left) and Unstable Living Situation Cohort (Right)



$\sigma^2$ : outlier

**Figure 3.** Pre- and Post-Intervention Food Insecurity Scores from Poor Consistency-of-Care Cohort (Left) and Good Consistency-of-Care Cohort (Right)



year, two years, or more distant from the original screen. Moreover, it would be meaningful to repeat this study but tie the food insecurity scores to measures of other chronic diseases of prevalence in the patient population, like depression or hypertension, posing the underlying question of whether improved food security impacts other aspects of health. Finally, the next logical step in this research is to attempt to replicate it at a

larger scale. A multicenter study of student-run clinics either regionally or nationally would strengthen the results of this work and speak to the replicability of this model.

#### Limitations of the Study

This study was limited by a small sample size, short follow-up period, and inability to directly correlate improved food insecurity status with

other health outcomes. Additionally, this study was conducted at a single student-run free clinic that operates on a primary care home model which may limit its applicability to other models that operate on a transitional or urgent care only basis. A final limitation of this study was the limited enrollment of eligible patients. Only 50% of eligible patients for the study were actually enrolled. Barriers to enrollment included access to phones, as questionnaires were administered over the phone, and inability to take time away from work to participate in the study. Additionally, the survey was conducted at a time when our patients felt particularly vulnerable and fearful due to pervading anti-immigrant political rhetoric which also contributed to low enrollment.

### Disclosures

The authors have no conflicts of interest to disclose.

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## **Appendix 1.** Examples of Grocery Lists and Recipes for Emergency Food Deliveries

### **Heart Healthy/Diabetic Diet Package:**

3-4 pieces boneless skinless chicken breasts  
1 lb ground turkey

1 dozen large white eggs  
8 oz reduced fat cheddar cheese

8 count whole wheat tortillas  
42 oz 1-minute Quaker oats  
1 box Uncle Ben's whole grain ready rice

14 oz frozen broccoli cuts  
2 green bell peppers  
2 cucumbers  
1 head romaine lettuce  
3 large plum tomatoes  
1 large red onion

8 oz organic frozen blueberries  
1 bunch bananas (5-7)

### **Example meals with ingredients from package:**

#### **Breakfast**

**Breakfast Burrito:** 2 eggs, 2 ounces reduced fat cheddar cheese-grated, 1/2 cup chopped green bell pepper, 1/4 cup chopped onion, 1 whole wheat tortilla, (hot sauce, salsa, salt and pepper as desired)

1. In a skillet, add cooking spray (or olive oil or butter) followed by chopped onion and green bell pepper
2. Whisk 2 eggs in a bowl, add to skillet once onions are translucent (clear) and peppers are soft
3. Scramble eggs in skillet until fluffy
4. Add grated cheese to whole wheat tortilla, followed by egg/vegetable mixture
5. Add seasoning and sauce as desired
6. Roll up tortilla and enjoy!

**Banana Berry Oatmeal:** 1/2 cup oats, 1 cup water (or milk if available), 1 banana sliced, 3/4 cup frozen blueberries

1. Add oatmeal, sliced banana, and water to microwave-safe bowl, stir
2. Microwave following instructions on oatmeal container
3. Once finished cooking, add frozen blueberries (add cinnamon or 1 tablespoon honey if available or desired), stir and enjoy!

#### **Lunch/Dinner**

**Grilled Chicken Salad Wrap:** 1 cup chopped romaine lettuce, 1 chicken breast, 1 cup chopped green bell pepper, 1 chopped tomato, 1/2 cup chopped onion, 1/4 cucumber chopped, 1 whole wheat tortilla, 1/4 cup reduced fat cheddar cheese

1. In a skillet, add cooking spray (or olive oil or butter) followed by chicken breast, cook for about 5-6 minutes on each side, or until white inside
2. Combine lettuce, cucumber, green bell pepper, tomato, onion in a bowl, toss with olive oil, vinegar,



or salad dressing as desired/available

3. Slice chicken breast and add to bowl
4. Empty contents of salad bowl onto tortilla, sprinkle grated reduced fat cheese on top
5. Roll up and enjoy!

**Chicken and Rice:** 1 chicken breast, 1/2 cup chopped green bell pepper, 1 chopped tomato, 1/2 cup chopped onion, 3/4 cup dry brown rice (1 1/4 cup cooked)

1. In a skillet, add cooking spray (or olive oil or butter) followed by chopped onion, cook until onions are clear
2. In a separate pot, cook rice following instructions provided on rice container
3. Slice raw chicken breast
4. Add chicken slices to skillet, cook for 4 minutes
5. Add tomato and green pepper, cook mixture until chicken is done (white on the inside) and vegetables are soft, add additional olive oil or cooking spray as needed
6. Mix cooked chicken and vegetables with brown rice in a bowl, add seasonings or hot sauce/salsa as desired
7. Plate and serve

**Turkey Burger Wrap:** 6 oz raw turkey meat, 1 egg, 1/4 chopped onion, 1/4 cup chopped green bell pepper, 1 whole wheat tortilla, 1/4 cup grated reduced fat cheddar cheese, 1/2 cup romaine lettuce, 1/2 cup frozen broccoli, 1 sliced plum tomato

1. In a bowl, combine raw turkey meat, onion, green pepper and raw egg- mix well and form into a patty
2. Preheat oven to 350 degrees F
3. In a skillet, add cooking spray (or olive oil or butter), cook turkey burger patty for 5-6 minutes on each side or until done
4. On a baking sheet, spray with cooking spray or drizzle with olive oil, add 1 cup frozen broccoli, add salt and pepper to taste (add chopped garlic is desired/available), cook for about 10 minutes or until fork tender
5. Once turkey burger is done, add to tortilla
6. Add sliced tomato, shredded cheese, and chopped lettuce to tortilla, wrap
7. Plate wrap and serve broccoli as a side dish, enjoy!

### **Diabetic Diet 1-day menu example with 13 servings of carbohydrate:**

**Breakfast:** 1 orange (1 carbohydrate serving), 1/2 cup bran cereal (1 carbohydrate serving), 1 cup fat-free milk (1 carbohydrate serving), 1 slice whole wheat toast (1 carbohydrate serving), 1 teaspoon margarine

**Lunch:** 2 ounces turkey breast, 2 slices rye bread (2 carbohydrate servings), 1 teaspoon margarine, 1 cup broth-based soup (1 carbohydrate serving), 1 lettuce and tomato salad, 1 tablespoon light salad dressing, 6 ounces artificially sweet yogurt (1 carbohydrate serving), 1 can diet soft drink

**Dinner:** 3 ounces baked chicken, 1/2 cup potatoes (1 carbohydrate serving), 1/2 cup green bean, 2 teaspoons margarine, 1 tossed salad, 1 tablespoon light salad dressing, 1 cup fat-free milk (1 carbohydrate serving), 1 small apple (1 carbohydrate serving)

**Snack:** 1 tablespoon nuts, 1/2 cup ice cream (1 carbohydrate serving), 1 1/4 cup strawberries (1 carbohydrate serving)

### Soft Diet Package:

1 lb ground turkey  
16 oz jar natural creamy peanut butter

1 dozen large white eggs  
8 oz reduced fat cheddar cheese  
32 oz light and fit nonfat vanilla yogurt

1 loaf 100% whole wheat bread  
1 can small red beans  
1 can black beans  
42 oz 1 minute Quaker oats  
1 box Uncle Ben's whole grain ready rice

16 oz frozen mixed vegetables  
10 oz frozen chopped spinach  
14 oz frozen broccoli cuts  
2 medium yams  
3 large plum tomatoes

8 oz organic frozen blueberries  
2 navel oranges  
1 bunch bananas (5-7)

### Example Meals with ingredients from package:

#### Breakfast

**Banana Berry Peanut Butter Oatmeal:** 1/2 cup oats, 1 cup water (or milk if available), 1 banana sliced, 3/4 cup frozen blueberries, 1 tablespoon peanut butter

1. Add oatmeal, sliced bananas, and water to microwave-safe bowl, stir
2. Microwave following instructions on oatmeal container
3. Once finished cooking, add frozen blueberries and peanut butter (add cinnamon or 1 tablespoon honey if available or desired), stir and enjoy!

**Yogurt and Fruit Parfait:** 1 cup vanilla yogurt, 1 sliced banana, 1 cup frozen blueberries

1. Defrost blueberries overnight in refrigerator
2. Combine 1 cup yogurt with sliced banana and add blueberries (can add 1 tablespoon honey if available or desired), enjoy!

**Veggie and Cheese Scramble:** 2 eggs, 1/4 cup reduced fat cheddar cheese-grated, 1 chopped tomato, 1/2 cup frozen spinach, 1/4 cup chopped onion (add peppers, salsa, hot sauce, salt and pepper as desired)

1. In a skillet, add cooking spray (or olive oil, vegetable oil, or butter) followed by onion, tomato, and spinach
2. Whisk 2 eggs in a bowl, add to skillet once onions are translucent (clear) and peppers are soft
3. Scramble eggs in skillet until fluffy
4. Plate the scramble and sprinkle with grated reduced fat cheddar cheese
5. Add seasoning or hot sauce/salsa as desired

## Lunch/Dinner

**Beans and Rice:** 1 cup beans, 1/2 cup frozen spinach, 1 chopped tomato, 1/2 cup grated cheese, 1/2 cup chopped onion, 3/4 cup dry brown rice (1 1/4 cup cooked)

1. In a skillet, add cooking spray followed by chopped onion, cook until onions are translucent (clear)
2. In a separate pot, cook rice following instructions provided on rice container
3. Add beans, tomato, and spinach, cook mixture until beans are hot and vegetables are soft, add additional olive oil or cooking spray as needed
4. Mix beans and vegetables with brown rice in bowl
5. Plate and sprinkle with grated cheese over the top, add seasonings or hot sauce/salsa as desired

**Turkey Burger with Mixed Vegetables and Sweet Potato Chips:** 6 oz raw turkey meat, 1 egg, 1/2 cup spinach, 1/2 cup mixed vegetables, 1 chopped tomato, 1/4 chopped onion, 1 sliced yam

1. In a bowl, combine raw turkey mean, onion, spinach, tomato, and raw egg- mix well and form into a patty
2. Preheat oven to 350 degrees F
3. On a baking sheet, spray with cooking spray or drizzle with olive oil, place sliced yams on sheet in a single layer, season with salt and pepper as desired, drizzle olive oil or spray cooking spray over top- cook for 10-15 minutes or until soft
4. In a skillet, add cooking spray, olive oil, or butter, cook turkey burger patty for 5-6 minutes on each side or until done
5. In a microwave-safe bowl, cook mixed vegetables for 1-2 minutes or until hot
6. Plate turkey burger, mixed vegetables, and sweet potato chips and enjoy!

## Soft Diet 1-day menu example:

**Breakfast:** 1/2 cup orange juice, 1/2 cup well-moistened dry cereal with 1/4 cup milk, 1 scrambled egg with 1 tablespoon cheese, 1 moistened biscuit, 1 cup low-fat milk

**Lunch:** 1 cup beef stew with vegetables- moist, 1 slice bread with 1 teaspoon butter to moisten, 1/2 cup canned fruit salad, 1/2 cup pudding, 1 cookie- moistened, 1 cup low-fat milk

**Dinner:** 1/2 cup potato soup made with milk, 1 slice bread with 1 teaspoon butter to moisten, 3 oz chicken- moist, 1/2 cup soft-cooked rice, 1/2 cup green beans, 1 cheese wedge, 1 slice apple pie with moist crust with 1/4 cup ice cream, 1 cup low-fat milk

## **Appendix 2.** Modified USDA Six-Item Short Form of the Food Security Survey

"The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you or your household in the past 30 days?

- Often True
- Sometimes True
- Never True
- Don't Know

"We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you or your household in the past 30 days?

- Often True
- Sometimes True
- Never True
- Don't Know

In the past 30 days, did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough food?

- Yes
- No
- Don't Know

If you answered yes to the last question, how many days did this happen?

- (Record number of days)
- Don't know

In the 30 days, did you ever eat less than you felt you should because there wasn't enough money for food?

- Yes
- No
- Don't Know

In the 30 days, were you ever hungry but didn't eat because there wasn't enough money for food?

- Yes
- No
- Don't Know

(Record Score)

Scoring – Each positive response is a point.

0 – 1 – High Food Security

2 – 4 – Low Food Security

5 – Very Low Security

**Appendix 3.** Case Study in Implementation of the Individualized Food Insecurity Protocol

Martina is an 85-year-old woman with osteoporosis, a body-mass index less than 18, malnutrition, gait instability with a history of falling, cataracts, anemia, chronic hepatitis C, and generalized anxiety disorder who reports “a hard time getting around.” She walks without assistive devices but is frail and does not leave her home unaccompanied. Her daughter is her sole caregiver and source of income. Her daughter has unsteady employment as a housekeeper and nanny and as a result has difficulty supporting herself and her mother. Martina and her daughter were recently threatened with eviction. Their current apartment is infested with mice and mold. Due to mobility issues, Martina has missed several previous follow-up appointments. Furthermore, her daughter oftentimes has difficulty picking up medications from the pharmacy due to long work hours.

Individualized Food Insecurity Protocol: Martina’s Experience:

- At a routine follow-up appointment with a clinical team, Martina answered “Yes” to the following 2 questions.
  1. *Within the past 12 months, we worried whether our food would run out before we got money to buy more.*
  2. *Within the past 12 months, the food we bought just didn’t last and we didn’t have money to get more.*
- She was then assessed by an Access-to-Care Team (ACT) Case Manager for food insecurity via the USDA Six-Item Short Form of the Food Security Survey; she was determined to be food insecure.
- The ACT Case Manager then assessed different variables that would affect Martina’s ability to access food at local food pantries and inputted these variables into the individualized food insecurity protocol tool
  - *Martina did not have any form of identification (Figure A1), and she needed access to a food pantry that would be open late, as her daughter would only be able to pick up food after work.*
- Martina’s daughter began receiving weekly groceries from the Community Kitchen and Food Pantry, one of the options that met all of Martina’s complex psychosocial needs
- With enough food on the table, Martina was able to gain a substantial amount of weight rapidly, increasing her weight from 96 to 115 lbs.

**Figure A1.** Utilizing Individualized Food Insecurity Protocol to choose only food pantries that do not require ID or proof of household

	Organization Name	Zip Code	Weekend hours	Weekday Hours	Evening Hours	Require ID/Proof of Household	Specialty Criteria (Qualification for food services)	Hot meal	Food pantries
4	Community Kitchen and Food Pantry	10026	No	Yes		No	Yes	Yes	
6	All Souls Church	10029	No	Yes		No	Yes	No	