

**Enhancing Quality and Utilization in Psychosis (EQUIP)**  
**Wellness Program for Patients with Severe Mental Illness**  
**MANUAL**

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## **Executive Summary**

The Wellness Program described in this manual was conceived as a direct result of the EQUIP research project (PI: Alexander Young, MD). The EQUIP project (“Evaluating Quality and Utilization in Psychosis”) was funded by the Department of Veterans Affairs Health Services Research and Development Service (VA HSR&D) to develop, implement and evaluate a collaborative care model for schizophrenia. EQUIP has been implemented at the Greater Los Angeles Healthcare System and the Long Beach Healthcare System in close collaboration with the VA Desert Pacific Mental Illness Research, Education and Clinical Center (MIRECC; [www.mirecc.org](http://www.mirecc.org)).

### **The EQUIP study**

The collaborative care model which is being tested in EQUIP is designed to improve treatment through assertive management of care, involvement and education of caregivers, and feedback of clinical information to clinicians. The model extends proven illness self-management approaches to family members and other caregivers, since these individuals are a critical component of successful treatment for schizophrenia. It creates a collaborative environment within which psychiatrists are responsible for guideline-concordant prescribing, and case managers are responsible for ensuring access to needed treatment services. By implementing a collaborative care model, the project targets key problems in care identified in previous studies of treatment quality in schizophrenia (failure to coordinate and monitor care for individual patients, lack of attention to illness self-management skills, and a minimal availability of clinical information).

By the study mid-point, EQUIP revealed that obesity (a common side-effect of newer antipsychotic medications) was a serious problem. At Long Beach, the mean BMI was 28.7 and 45% of patients met criteria for obesity. At GLA, the mean BMI was 27.4 and 35% of patients were obese. Although local managers, mental health clinicians, and nutritionists believed strongly in the need for targeted services for obesity, there were no treatment resources available at these sites. As a result, the EQUIP team developed this standardized protocol for wellness services specifically designed for patients with severe mental illness (SMI). Wellness program sessions rely heavily on material from two sections of the Solutions for Wellness Group Program<sup>1</sup>: (1) Fitness and Exercise and (2) Nutrition, Wellness, and Living a Healthy Lifestyle.

### **Key Individuals in the Wellness Program**

There are three key individuals who are the integral to the success of this Wellness Program: the patient’s treating clinicians (psychiatrist and case manager), the clinical staff running the wellness groups, and the nutritionist. Psychiatrists should be alerted to address weight problems in their medication treatment and to utilize guideline-concordant approaches to switch to a medication with less weight gain liability or add medications that can reduce weight gain. A treatment guideline synopsis used in EQUIP and a full literature review which immediately follow this Executive Summary can both be of help in deciding the best medication treatment regime to address weight issues. Case managers can assist in lifestyle changes and ongoing support and encouragement. The clinical staff running the groups provides psychoeducation and social support in a group format. Nutritionists, trained to work with this specialized population, can assist in running groups, provide ongoing consultation to clinicians and clinical staff, and provide individualized interventions for particular patients (including food diaries, meal planning, etc.).

## Treatment Guideline Synopsis for Weight Gain

Weight gain is the most important side-effect of the second generation antipsychotic medications. Being overweight places an individual at increased risk for diabetes, hyperlipidemia, morbidity and death. Given their high risk for obesity, all patients with schizophrenia should have their weight monitored. It is helpful to monitor Body Mass Index (BMI), which equals an individual's weight in kilograms divided by the square of their height in meters. A BMI calculator is available by clicking on [www.nhlbisupport.com/bmi/bmicalc.htm](http://www.nhlbisupport.com/bmi/bmicalc.htm). Normal BMI is between 18.5 and 25, overweight BMI between 25 and 30, and a BMI above 30 indicates obesity. People with a BMI between 19 and 22 live the longest.

Weight gain should be detected early so that action can be taken before the patient is very overweight. Antipsychotic medications differ in the severity with which they cause weight gain. The GREATEST potential for weight gain occurs with clozapine and olanzapine. These cause short-term weight gain that averages about 10 pounds, and long-term weight gain that can be much greater. MODERATE potential for weight gain occurs with risperidone, quetiapine, chlorpromazine and thioridazine. The LEAST potential for weight gain occurs with aripiprazole, ziprasidone, and other first generation antipsychotic medications.

Switching to an antipsychotic medication with less potential for weight gain is the most effective strategy. A number of pharmacologic strategies have been proposed that consist of adding an augmenting medication, such as topiramate or orlistat. This may be helpful in some patients. If a patient is taking a concomitant medication that causes substantial weight gain, such as valproate or paroxetine, one should consider discontinuing it.

A cornerstone of weight management is dietary control and exercise. Overweight patients should receive ongoing counseling regarding control of diet, plus consultation from a nutritionist. Simple approaches, such as low-carbohydrate diets, are likely to be more effective than complex approaches, such as calorie counting. A program for increasing activity and exercise should be strongly considered, with consultation from physical therapy and wellness programs.

### References & For More Information:

NIH information: [http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/profmats.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/profmats.htm)

BMI calculator & tables: <http://www.nhlbisupport.com/bmi/bmicalc.htm>

General information: <http://www.mirecc.org/resources.shtml>

## Overview of Weight Issues in Patients Treated for Psychosis

### Weight Gain Associated with Antipsychotic Medications

There have been several well-documented studies showing a strong correlation between antipsychotic medications and weight gain. A comprehensive comparison of the weight gain experienced by patients while taking various antipsychotic medications was compiled (see Table 1), using a meta analysis of 81 studies that included data on weight change in antipsychotic-treated patients.

Table 1. Mean weight gain at 10 weeks on a standard dose (Random Effects Model) <sup>2</sup>

Medication	Weight (in kg)
Clozapine	4.45
Olanzapine	4.15
Thioridazine	3.19
Chlorpromazine	2.58
Risperidone	2.10
Nonpharmacological control	1.33
Haldol	1.08
Fluphenazine	0.43
Ziprasidone	0.04
Molindone	-0.39
Placebo	-0.74

Most of the weight gain appears to occur during the first 6 months of treatment with an antipsychotic medication. However, there is still evidence of some weight gain, which may occur after this time period. Study data comparing approximate, longer-term (1 year) mean weight gain on atypical antipsychotic medications is shown in Table 2. <sup>3,4</sup>

Table 2. Mean weight gain at one year

Medication	Weight (in kg)
Olanzapine	6.5
Quetiapine	3.0
Risperidone	2.0
Ziprasidone	0.5

Weight gain has been strongly associated with the development of type II diabetes. The prevalence of both obesity and diabetes among patients suffering from schizophrenia is approximately 1.5-2.0 times higher than in the general population <sup>5</sup>, although some inpatients studies suggest that the prevalence of diabetes may be nearly 3 times higher than the general population from the same geographical area <sup>6,7</sup>.

Drug-induced hyperglycemia can be caused by insulin resistance, which in turn, may be due to weight gain, or by a direct effect on insulin-sensitive target tissues. Although much of the increase in diabetes in patients with schizophrenia may be due to weight gain, there is evidence that two medications in particular (Clozapine and Olanzapine), appear to cause higher fasting and postprandial insulin levels than patients treated with first generation antipsychotics, even after adjusting for body weight <sup>6</sup>.

In reviewing the available data on the atypical antipsychotic medications, it appears that Clozapine and Olanzapine consistently show an increased risk for diabetes <sup>5, 8-10</sup>. The risk for Risperdal and Quetiapine are less clear, as some studies suggest an increased risk, while others do not <sup>8-10</sup>. Ziprasidone and Aripiprazole has thus far not shown an increased risk for diabetes <sup>5</sup>.

In reviewing the available information regarding lipid abnormalities associated with antipsychotic medications, these abnormal lipids appear to correlate with the propensity of the medication to cause weight gain. Among the atypical antipsychotic medications, Clozapine and Olanzapine appear to be associated with the greatest increases in total cholesterol and Triglyceride levels, and with the greatest decrease in HDL cholesterol <sup>5</sup>. The information on LDL is more controversial, as some studies appear to show an increase in LDL with these two medications, while others do not <sup>5, 10</sup>. Risperidone and Quetiapine appear to have less negative impact on lipid profiles <sup>5, 10</sup>, and Ziprasidone and Aripiprazole appear to not have any significant impact on lipid profiles <sup>5</sup>.

As shown in this section, weight gain associated with some atypical antipsychotic medications, can be significant, and may be interrelated with other risks factors for CHD, such as diabetes and abnormal lipid profiles. The most weight gain appears to be associated with Clozapine and Olanzapine, and these medications are also associated (independently), with abnormal glucose metabolism. Patients suffering from obesity, diabetes, hyperlipidemia, or other complications of being overweight (as listed in the next section), or are gaining weight on their current medication(s), should be evaluated very carefully when choosing or changing an antipsychotic medication. First line medications in the above patient population, should be those associated with the least risk for weight gain. As reported earlier, most of the weight gain associated with atypical antipsychotic medications, appears to occur during the first 6 months of use. Therefore, when antipsychotic medications are to be used, weight management interventions should be employed at the onset of antipsychotic therapy.

### **Medical Consequences of Being Overweight**

Higher morbidity is associated with being overweight, and this increase rises as the body mass index (BMI) rises above 20 kg/m<sup>2</sup><sup>11</sup>. The health risks for obesity include hypertension, diabetes type II, coronary heart disease, congestive heart failure, CVA, gallbladder disease, osteoarthritis, sleep apnea, colon cancer, breast cancer, and endometrial cancer. The specific increase in risk for each of these disease entities will be further explored in this section.

Blood pressure increases progressively with higher BMI values in both men and women. The prevalence of high blood pressure in men with a BMI >30 is 2.1 times higher than in men with a BMI <25 (38.4% vs 18.2%) <sup>11</sup>. The prevalence of hypertension in women with a BMI >30 is 1.9 times higher than in women with a BMI <25 (32.2% vs. 16.5%) <sup>11</sup>. Hypertension is a significant risk factor for the development of cardiovascular disease, with all its associated complications (i.e., coronary heart disease (CHD), cardiovascular accident (CVA), congestive heart failure (CHF)).

The development of diabetes type II, has been associated with weight gain after the age of 18 in both men<sup>12</sup> and women<sup>13</sup>. The relative risk of diabetes increases by approximately 25% for each additional 1kg/m<sup>2</sup> increase in BMI above 22 kg/m<sup>2</sup><sup>14</sup>.

The risk of CHD and nonfatal myocardial infarction (MI) increase with increasing BMI levels. In the Nurses' Health Study, which controlled for age, smoking, parental history of CHD, menopausal status, and hormonal use, the risks for CHD were twice as high at BMIs between 25-28.9, and three times as high at BMIs at 29 or greater, as compared to BMIs less than 21<sup>15</sup>.

The risk of CHF increases with weight in a number of studies, including the Framingham Heart Study<sup>16</sup>. This stems from several possible physiological changes associated with weight gain, including alterations in cardiac structure and function. These changes, such as ventricular dilation and eccentric hypertrophy, can result in both diastolic and systolic dysfunction.

The risk of ischemic, but not hemorrhagic strokes, correlates with increasing BMI. The ischemic stroke risk is 75% higher in women with BMI >27, and 137% higher in women with a BMI >32, as compared with women having a BMI <21<sup>10, 17</sup>.

The risk of gallstones increases in both men and women. For example, in women, the risk of either gallstones or cholecystectomy is as high as 20 per 1,000 women per year with BMIs >40, as compared with 3 per 1,000 women per year with BMIs <24<sup>18</sup>.

The risk of osteoarthritis increases with body weight, and is significantly associated with increased pain in weight-bearing joints. For example, in a study of twin middle-aged women, it was estimated that for each kg of weight gain, the risk of developing osteoarthritis increases by 9-13%<sup>19</sup>.

Upper body obesity is a risk factor in the development of sleep apnea, and has been shown to be related to its severity. In particular, large neck girth is highly predictive of sleep apnea. Most people with sleep apnea have BMIs >30<sup>20</sup>. The medical consequences of sleep apnea include arterial hypoxemia, interrupted sleep, pulmonary hypertension, systemic hypertension, and cardiac arrhythmias.

There appears to be a correlation between obesity and colon, breast, and endometrial cancer. The increased risk of colon cancer is somewhat controversial, and so will not be reported here. In postmenopausal women, there is a direct correlation between obesity and breast cancer. A gain of more than 20 lbs from age 18 to midlife doubles the risk of developing breast cancer<sup>21</sup>. The risk of endometrial cancer is three times higher among women with BMIs >30kg/m<sup>2</sup> as compared with women having BMIs <25<sup>22</sup>.

It is now clear that the medical consequences of being overweight are extensive. Given the severity of these medical complications, more aggressive measures should be employed by health care providers toward the treatment and prevention of weight gain and obesity.

### **Pharmacologic Approaches which May Assist with Weight Loss**

The use of medications for the treatment of obesity are generally recommended only as an adjunct to dietary measures, exercise, and behavioral modifications. Recently published APA practice guidelines on the treatment of patients with schizophrenia, recommend that in patients with a BMI>18.5, "an increase in BMI

of 1 BMI unit would suggest a need for intervention by monitoring weight more closely, engaging the patient in a weight management program, using an adjunctive treatment to reduce weight, or changing the antipsychotic medication.”<sup>23</sup>. Medications which may assist with weight loss, are recommended under the following circumstances:

1. In those patients with a BMI of  $> 30\text{kg/m}^2$ , or with a BMI of  $>27\text{kg/m}^2$  when combined with medical comorbidities (diabetes, CHD, hyperlipidemia, history of CVA, hypertension (HTN)).
2. Patients who have met the above criteria, and have not lost at least 8-10% of baseline weight after more than 6 months in spite of diet modification with an adequate exercise program<sup>24</sup>.

FDA approved medications which assist with weight loss generally fall into two main categories: Those that decrease food intake by suppressing appetite, and those that decrease nutrient absorption. Each category of medications will now be examined in more detail.

#### Medications which reduce appetite

Most appetite suppressants work by increasing anorexigenic neurotransmitters, such as serotonin, norepinephrine, and dopamine. Medications which increase serotonin only, notably, Fenfluramine and dexfenfluramine, were withdrawn from the market in the United States because of associations with valvular heart disease and pulmonary hypertension.

The most well studied noradrenergic medication used for weight loss to date is phentermine. This medication is approved by the FDA for short-term use only (i.e., less than 12 weeks for the treatment of obesity)<sup>25</sup>. The usual recommended dose of phentermine is 18.75-37.5mg PO QAM. The average amount of weight loss in the general population has been 4-20 lbs (2-10 kg) compared to placebo in the short term (6 months)<sup>25</sup>. The side effects of phentermine include insomnia, dry mouth, constipation, euphoria, palpitations, and hypertension. Unfortunately, phentermine is generally not recommended in patients suffering from schizophrenia, as its dopaminergic effects may worsen psychosis. Phentermine is contraindicated in patients suffering from hypertension, advanced cardiovascular disease, hyperthyroidism, glaucoma, and those having a history of substance abuse. Phentermine should not be used in patients taking MAOIs, guanethidine, tricyclic antidepressants, sibutramine, CNS stimulants, or EtOH<sup>25</sup>.

Sibutramine is a medication which inhibits norepinephrine reuptake, serotonin reuptake, and to a lesser extent, dopamine reuptake. It is approved by the FDA for long-term use for weight loss and weight maintenance in conjunction with dietary measures involving caloric restriction. The recommended dose for sibutramine is 5-15mg PO QD. In several studies, patients taking sibutramine while following a reduced calorie diet, lost 5-8 percent of their preintervention weight, as compared with 1-4 percent among patients receiving placebo<sup>26-29</sup>. Sibutramine appeared to help maintain reductions in weight as compared to placebo for at least a year in one study<sup>30</sup>. The side effects of sibutramine can include hypertension and tachycardia, although these appear to be mild. Other side effects include insomnia, headache, constipation, and dry mouth. Sibutramine is contraindicated in patients suffering from uncontrolled hypertension, severe hepatic dysfunction, severe renal impairment, narrow-angle glaucoma, coronary artery disease, arrhythmias, congestive heart failure, history of CVA, and those having a history of substance abuse. Sibutramine should

not be used in patients taking MAOIs, SSRIs, centrally active anorexiant, sumatriptan, dihydroergotamine, dextromethorphan, meperidine, pentazocine, fentanyl, tryptophan, and lithium<sup>25</sup>.

#### Medications that decrease nutrient absorption

Orlistat is a medication which binds to gastrointestinal lipases in the lumen of the small intestine, which prevents hydrolysis of dietary triglycerides into absorbable free fatty acids and monoacylglycerides. It is approved by the FDA for long-term use for weight loss and weight maintenance. Patients taking orlistat will excrete approximately one third of the dietary fat that is ingested, thereby reducing calorie absorption. The usual dose is 120mg PO TID within 1 hour of a meal. It is recommended that patients should also take a daily multivitamin at least 2 hours before or after taking orlistat, as this medication can reduce the absorption of fat-soluble vitamins. Patients taking orlistat lost approximately nine percent of their preintervention weight as compared with 5.8 percent of those who took placebo<sup>31</sup>. In longer-term studies (i.e., longer than one year), orlistat appeared to decrease diastolic blood pressure, lower fasting insulin levels, and reduce total cholesterol and LDL cholesterol, in a manner which was independent of weight loss<sup>32,33</sup>. The side effects of orlistat include fecal urgency, fecal incontinence, steatorrhea, and flatulence. These side effects led to discontinuation in approximately nine percent of patients, as compared with five percent taking placebo<sup>31</sup>. Orlistat is contraindicated in patients suffering from chronic malabsorption syndromes and in cholestasis. Orlistat should not be taken with cyclosporine, as this may impair its absorption.

#### Non-FDA approved medications/off-label use

Topiramate has been used as an anticonvulsant, and as a mood stabilizer. However, there have been a number of case reports involving patients with mental illness, who have lost weight with topiramate. The weight loss ranged from 7 to 33 kg over the course of 2 to 8 months<sup>34-38</sup>. Topiramate is usually started at 25mg PO BID and then titrated up to 400mg /day. The side effects of topiramate include cognitive slowing, sedation, dizziness, fatigue, leukopenia, and kidney stones. Topiramate should be used with caution in patients suffering from dementia or other cognitive impairments, and in patients who are taking other medications which have a propensity to cause bone marrow suppression, such as Carbamazepine. There have also been case reports involving Topiramate-induced leukopenia in patients taking Clozaril, although this data has not been as clearly demonstrated<sup>39</sup>.

Metformin is an oral hypoglycemic medication that has also been shown to have weight reducing effects in some patients. There has been one open-label study on the use of metformin for weight gain due to antipsychotic use. Metformin at 500mg PO TID was added to existing antipsychotic medications (olanzapine, quetiapine, risperidone, or valproic acid) in patients who had gained more than 10% of their baseline weight. In a period of 12 weeks, these patients showed a statistically significant decrease in BMI of 2.22kg/m<sup>2</sup> and an average weight loss of 2.93kg<sup>40</sup>.

The side effects of metformin include nausea, vomiting, diarrhea, and lactic acidosis. Lactic acidosis is estimated to occur at a rate of 3 cases per 100,000 patient-years of exposure. Metformin should be used with caution in patients with a history of EtOH abuse, and is contraindicated in patients with hepatic dysfunction, renal insufficiency, congestive heart failure, and pulmonary disease, due to a higher risk of lactic acidosis<sup>41</sup>.

Amantadine is an antiviral and anti-Parkinsonian medication, that acts by stimulating dopamine release, and by inhibiting dopamine reuptake. In a recent study, patients who had experienced an average weight gain of 15 lbs while being treated with Olanzapine, were then treated with amantadine 100-300mg/day for a 12 week period. The average weight loss at week 4 was 1.1 kg, and 2.2 kg by the end of the study<sup>42</sup>. Amantadine

should be used with caution in schizophrenic patients, as this medication can be associated with worsening psychosis.

Nizatidine is an H<sub>2</sub> antagonist, which may assist with weight loss by reducing appetite or by suppression of gastric acid secretion<sup>43</sup>. A prospective, randomized, double blind study was conducted to evaluate the potential for nizatidine to limit the amount of weight gain in patients receiving olanzapine. It was found that patients receiving nizatidine at 300mg BID gained 25% less weight over 16 weeks as compared with the placebo group (3.9kg vs 4.8kg). However, this difference was not statistically significant<sup>44</sup>.

#### General comments regarding pharmacotherapy for weight loss

It is recommended that medications used for weight loss be used singly rather than in combination. Combination drug therapy may increase the risk of adverse events. These medications should only be used as part of a comprehensive program that includes behavior therapy, dietary measures, and an increase in physical activity. After starting medications, patients need to return for follow-up in 2-4 weeks, then once a month for the first 3 months, and then once every 3 months for the first year. During these visits, it is important to monitor their weight, blood pressure, pulse, and for the appearance of any adverse side effects.

Herbal medications, although highly popular, are not recommended as part of a weight loss program. These preparations have unpredictable amounts of active ingredients, and unpredictable amounts of other additives, which may cause serious side effects.

## Wellness Sessions

### Assessment and Referral to the Wellness Program

Assessment of a patient should include the evaluation of two components: Body mass index (BMI) or waist circumference, and risk factors or medical comorbidities.

#### Body Mass Index

BMI is a measurement of an individual's weight in relation to their height and is commonly used to determine desirable body weights. To estimate BMI, multiply the individual's weight (in pounds) by 703, and then divide by the height (in inches) squared. This approximates BMI in kilograms per meter squared ( $\text{kg}/\text{m}^2$ ) (Appendix A). There is evidence to support the use of BMI in risk assessment since it provides a more accurate measure of total body fat compared with the assessment of body weight alone.

#### Waist Circumference

Excess abdominal fat is an important, independent risk factor for disease. The evaluation of waist circumference to assess the risks associated with obesity or overweight is supported by research reviewed in this manual. The risk of medical complications, particularly heart disease, increases when body fat is distributed around the waist, especially in the abdomen. The measurement of waist-to-hip ratio provides no advantage over waist circumference alone. This measurement is particularly useful in patients who are categorized as normal or overweight.

#### Risk Factors or Comorbidities

Overall risk must take into account the presence of certain other risk factors. These include things like smoking, physical inactivity, family history of premature heart disease, high blood pressure, high LDL or "bad" cholesterol, low HDL or "good" cholesterol, and high blood glucose. Some diseases or risk factors associated with obesity place patients at a high absolute risk for subsequent mortality; these will require aggressive management. Other conditions associated with obesity are less lethal but still require treatment.

Referral to the wellness program is indicated for a patient with any of the following:

1. BMI of 25 to 29, who have two or more additional risk factors
2.  $\text{BMI} \geq 30$
3. Waist measurements of 40" or more for males, and 35" or more for females

The patient's psychiatrist or case manager can refer the patient to the program by contacting the clinical staff in charge of the program. At the time of referral, the patient's psychiatrist or case manager should confirm that the following labs have been completed in the last three months (and if not they should be ordered at the time of referral): Lipid profile, which includes total cholesterol, LDL, HDL, and Triglycerides, and a Heme A1C.

At the time of the referral, the clinical staff from the Wellness Program will direct the patient's psychiatrist to the Treatment Guideline Synopsis (page 4 of this manual) and Tables 1 and 2 in the literature review (page 5 of this manual) regarding weight gain associated with antipsychotic medications. Psychiatrists will be asked to consider a medication switch to an antipsychotic with less weight gain potential or, as a secondary response, to add a medication for weight (e.g., Toprimate).

**Important Notes for the Wellness Sessions:**

Wellness program sessions rely heavily on material from the two sections of the Solutions for Wellness Group Program<sup>1</sup>: (1) Fitness and Exercise and (2) Nutrition, Wellness, and Living a Healthy Lifestyle. Several of the wellness session below will refer you to pages in the patient manual sections of this group program.

There are separate instructor's notes to guide your use of the patient manual. The Instructor's Notes and Patient Manual for the two sections of the Solutions for Wellness Group Program can be found at [http://www.treatmentteam.com/health\\_fitness/health\\_fitness.jsp](http://www.treatmentteam.com/health_fitness/health_fitness.jsp) in the left column under Solutions for Wellness Program. Note that the page numbers referred to in the wellness session section below are the numbers that are centered at the bottom of the patient manual page, not the page number of the pdf document. Throughout the wellness session section below there are additional passages to guide and educate instructors on the session topic, although this information will not be directly used in session.

Sessions are improved significantly by review and preparation prior to each class. Sessions are also improved by providing each participant a copy the pages of the patient manual to be covered during that session. Participants can keep their pages of the patient manual or you may develop a notebook for each of them that you bring to the sessions each week.

Sessions are likely to last about 45 minutes and should be scheduled at least weekly. There are a total of 16 sessions. Patients can enter the program at any time---they need not wait until Session 1 begins. Patients should continue until they have completed the full 16 sessions. Patients can repeat the program as needed.

Helpful skills for instructors:

There are several strategies that are helpful for effective education with this population and these include<sup>45</sup>.

1. Engage participants by having them read aloud.
2. Direct majority of questions to participants by name (say name then ask question).
3. Summarize frequently.
4. Involve each person about the same number of times.
5. Identify, write on board, discuss, and repeat main goal and points of session.
6. Provide positive feedback for relevant participation. Re-direct irrelevant comments.
7. Give concrete examples that apply to participants' lives. Encourage participants to provide examples.
8. Apply all 5 teaching strategies (see it, hear it, say it, write it, use it).
9. Use adult tone of voice. Do not "talk down" to participants.
10. Use handouts.
11. Use immediate prompting for inattentive participants.

All sessions begin with:

- Attendance
- Weigh in by all participants
- Sharing with participant where he falls on colored coded BMI chart (Appendix A), where green indicates ideal BMI, yellow indicates overweight BMI, and orange indicates obese BMI.
- Knowledge assessment (when indicated) (Appendix B)
- Quick review of main points of previous session

All sessions end with:

- Repeat knowledge assessment (when indicated)

Tools needed for sessions:

- White board or chalk board
- Handouts of readings and knowledge test questions to be covered
- Pens/pencils
- Food models are helpful for some sessions
- Nutrition in the Fast Lane (booklet from Lilly) is used in session 12

**Session 1:**

**Goal: Increase knowledge about health problems associated with poor diet**

**Knowledge assessment questions: None for today**

Use page 4 and page 6 of the Nutrition and Wellness section of the Solutions for Wellness manual (Health Problems Associated with a Poor Diet)

**Sessions 2 and 3:**

**Goal: Increase knowledge about Food Pyramid and Portion Sizes**

**Knowledge assessment questions: 1-3 (only test on the section covered on that day)**

Use pages 9-11 of the Nutrition and Wellness section of the Solutions for Wellness manual (Food Pyramid and Portion size)

Helping members understand portion/serving sizes is of utmost importance. Supplying people with concrete, visual examples such as measuring cups, spoons, and food models (obtained from National Dairy Council) can be extremely helpful in increasing their understanding of recommended serving sizes. An excellent pocket guide to food portions using everyday objects as examples of serving sizes is provided in Appendix C.

When reading food labels and counting calories, one must be careful to note the serving size that the figures are based on since there is often more than one serving included in a single package.

It is necessary to emphasize the importance of making wise food choices and to focus on portion control regardless of where they meals are eaten (e.g., restaurant, Board and Care, parent's or friend's home, or when alone). Saying no to a second helping being offered at a Board & Care or choosing medium rather than

a super-sized portions at fast food restaurants are examples of simple steps one can begin to take in order to take better control of their diet.

**Session 4:**

**Goal: Increase knowledge regarding foods to be increased: Fiber**

**Knowledge assessment question: 4**

Use pages 15-16 of the Nutrition and Wellness section of the Solutions for Wellness manual (Choose a Diet with Plenty of Grain Products, Vegetables, and Fruits)

**Session 5:**

**Goal: Increase knowledge regarding foods to be increased: Water**

**Knowledge assessment questions: 5-7**

Use page 23-24 of the Nutrition and Wellness section of the Solutions for Wellness manual (The Role of Water in Good Nutrition)

The importance of water as part of a healthy diet cannot be overstressed. Keeping one's body well hydrated is essential for it to function properly. Since water has no caloric value, it is not considered to be an energy source, but we could not digest or absorb the foods that we eat or eliminate the body's digestive waste without it. Our bodies are made up of 65 percent water, and it takes an average of eight to ten cups to restore the water that we lose during the course of a day. Water is restored through drinking liquids (preferably those without caffeine, alcohol, or too much sugar), and through the foods we eat. Fruits and vegetables contain anywhere from 80 to 95 percent water, meats are made up of 50 percent water; and grains (e.g., oats and rice) can have as much as 35 percent water. Drinking extra water while trying to lose weight can also help you eat less because it gives you the sensation of feeling full.

**Session 6:**

**Goal: Increase knowledge regarding the importance of exercise**

**Knowledge assessment question: None for today**

Use the last two paragraphs of page 14 of the Nutrition and Wellness section of the Solutions for Wellness manual (Balance the Food You Eat with Physical Activity – Maintain or Improve Your Weight). The paragraph starts with "People with mental illness.....". Also use page 3 of the Fitness and Exercise section of the Solutions for Wellness manual (Common Roadblocks Preventing People from Exercising).

Discuss realistic goals for starting to increase exercise.

**Session 7:**

**Goal: Increase knowledge regarding foods to be decreased: Fat and Cholesterol**

**Knowledge assessment questions: 8-10**

Use paragraph one on page 7 (Heart Disease and Stroke) and use pages 17-18 both in the Nutrition and Wellness section of the Solutions for Wellness manual (Choose a Diet Low in Fat, Saturated Fat, and Cholesterol)

Note: The Food Pyramid on page 9 is likely to be referred to in this class. You may want to make multiple copies of it to use in this class.

Fats, which provide 9 calories of energy per gram, are the most concentrated of the energy-producing nutrients. This is why our bodies need so little fat in order to function properly. To understand the problem with a diet that is high in saturated fat, one must first understand its link to cholesterol. Our bodies need cholesterol in order to function properly. Cholesterol helps build cell membranes, protect nerve fibers, and helps produce vitamin D and certain hormones. But since the body produces all the cholesterol it needs in the liver and small intestine, we do not need to add cholesterol to our diet.

Foods that are high in saturated fat (animal fats) such as eggs, dairy products, and meats, also contain high amounts of cholesterol. When we eat these foods, we increase the level of a cholesterol carrying substance in our blood that can be harmful to our health. Because of this, saturated fats, present in foods like beef, ice cream, yellow cheeses, and doughnuts should make up no more than 10 percent of our daily caloric intake. It is thought that most Americans get anywhere from 15 to 50 percent of their daily calories from fats alone. Health experts consider a diet that derives more than 30 percent of its calories from fat to be unsafe, increasing the risk of heart disease. Monounsaturated fats (found in olive, peanut, and canola oils) appear to have the best effect on lowering cholesterol. Polyunsaturated fats (found in items like margarine, sunflower, soybean, corn, and safflower oils) are considered to be healthier than saturated fats, but if consumed in excess of more than 10 percent of daily caloric intake, can also be harmful by having a negative effect on good cholesterol.

### **Session 8:**

#### **Goal: Starting Exercise**

**Knowledge assessment questions: None for today**

Use pages 28-29 of the Fitness and Exercise section of the Solutions for Wellness manual (Getting Started with an Exercise Program).

### **Session 9:**

#### **Goal: Increase knowledge regarding foods to be limited: Sugars**

**Knowledge assessment questions: 11-12**

Use paragraphs 2 and 3 on page 7 (High Blood Pressure and Diabetes) and use page 19 both in the Nutrition and Wellness section of the of Solutions for Wellness manual (Choose a Diet Moderate in Sugars)

Simple sugars (those that are refined from naturally occurring sugars and then added to processed foods) require little digestion and are quickly absorbed by the body. This process wreaks havoc on our bodies and triggers a series of unhealthy events. The body's rapid absorption of simple sugars elevates the levels of glucose in the blood, which in turn triggers the release of the hormone insulin. The presence of insulin in the bloodstream helps bring excess glucose levels under control, but after about an hour or two, blood glucose levels may fall so low that the body makes up for it by releasing anti-insulin hormones. This surge of chemicals can leave a person feeling irritable and nervous.

Many processed foods not only contain high levels of added simple sugars, but they also tend to be high in fat and lacking in the vitamins and minerals that are naturally found in complex carbohydrates. Because of this, nutritionists often refer to these types of foods as “junk foods”, or as foods containing “empty calories”. In the typical American diet, only 40-50 percent of total calories come from carbohydrates, nearly half of which come from processed foods filled with simple sugars. Experts recommend that these foods make up no more than 10 percent of our diet because of their lack of nutritional value. Foods rich in complex carbohydrates (an excellent source of energy) should make up roughly 50 percent of our daily calories.

One of the first steps toward helping improving one’s diet would be to limit one’s daily intake of foods high in refined sugar and saturated fats. Limiting foods such as sodas, candy bars, fried foods, high fat salad dressings, fast foods high in saturated fats, chips, nuts, etc, can only stand to lower one’s risk for problems like heart disease and certain cancers. Suggest substituting with diet sodas, drinking more water, eating more fruits and vegetables, and substituting salsa, fat free or low-fat condiments. Asking people to eliminate fatty and processed foods altogether is unreasonable and a sure-fire way to set them up for diet failure. Helping them set expectations that they can strive toward and likely achieve, will increase the likelihood that they will be able to develop changes in their diet that they will adhere to long after the group has ended.

**Session 10:**

**Goal: Increase walking as an exercise**

**Knowledge assessment question: None for today**

Use pages 22-23 (Walking – an Ideal Exercise) and page 31 (When to Stop Exercising) both of the Fitness and Exercise section of the Solutions for Wellness manual.

**Session 11:**

**Goal: Learn ways to control hunger**

**Knowledge assessment question: None for today**

Use page 32 of the Nutrition and Wellness section of the Solutions for Wellness manual (Controlling Your Hunger)

Helping participants learn to pay attention to hunger and satiety cues may be a bit difficult due to their intangible nature. Prompt members to pay attention to whether they are eating because they are truly hungry or for some secondary gain, such as to combat boredom, feeling sad, lonely. Real hunger should not occur for at least 4 hours after a good-sized meal and 2 hours after a snack. This is also an opportune time to talk about the degree of satiety one should feel after eating a meal versus a snack.

**Session 12:**

**Goal: Increase knowledge regarding foods to be limited: Salt and Sodium; Discuss Fast Food restaurants**

**Knowledge assessment question: 13**

Use page 20 of the Nutrition and Wellness section of the Solutions for Wellness manual (Choose a Diet Moderate in Salt and Sodium); Also use Lilly Fast Food restaurant booklet: Nutrition in the Fast Lane (refer participants to the columns for fat, sugars, sodium)

Taking into account the fact that fast food places are so accessible and convenient in today's society, as part of their wellness program Eli-Lilly has come out with a condensed, user-friendly guide to the various fast food chains' menus that includes caloric values and nutritional information for each of the items listed. A review of this handout can be useful for those who frequently eat out. Pointing out choices at restaurants that provide "better" menus can help provide members with useful tools to help in their decision-making and meal planning.

**Session 13:**

**Goal: Discuss expectations for changing your eating and exercise lifestyle**

**Knowledge assessment questions: None for today**

Many times an all-or-nothing view of success is what gets in the way of making progress towards one's goals. Certain key points should be stressed in order to help members realize that trying to change something as ingrained and complex as one's diet and exercise routine is a difficult and lifelong process:

- 1) In the beginning, set easy, obtainable, and measurable goals.  
This will boost confidence and increase motivation.
- 2) Set the right expectations. Expect to slip-up along the way.  
Expecting to do it all perfect from the beginning can create an atmosphere that is not only unrealistic, but also not conducive to success. Expecting and admitting to yourself where you have failed is an important part of growing as you head toward your goal.
- 3) Practice damage control.  
When you do slip-up, it is important to recognize this early. Don't be too harsh on yourself, and don't throw it all away. Try to get back on track as quickly as you can so as not to delay or sabotage the progress you have already made.
- 4) Reward yourself along the way.  
Find healthy pleasures and substitutes for eating. If you have a craving for sweets, try eating a piece of fresh fruit first. If you still have the craving after 5-10 minutes, go ahead and indulge a little in a sweet snack. Drinking a lot of water (naturally flavored with lemon for example) throughout the day can help keep hunger urges at bay.
- 5) Be patient.  
Remember that it is a life-long process to change one's eating habits and get comfortable with regular exercise. Little changes at a time are big successes. Many bad habits may need to be unlearned before they can be replaced with newer, healthier ones.
- 6) Be forgiving.  
These are difficult tasks to undertake, but ones that will ultimately hold huge rewards as you begin to look and feel better about yourself.

**Session 14:**

**Goal: Increase knowledge about the importance of avoiding alcohol**

**Knowledge assessment questions: 14-15**

Use page 22 of the Nutrition and Wellness section of the Solutions for Wellness manual (Avoid Alcohol).

With extra time, review the importance of increasing water intake (pages 23-24 of the Nutrition and Wellness section of the Solutions for Wellness manual).

**Session 15:**

**Goal: Fitting Exercise into Daily Routine**

**Knowledge assessment questions: None for today**

Use pages 34-35 (Fitting Exercise into Your Daily Routine) of the Fitness and Exercise section of the Solutions for Wellness manual.

**Session 16:**

**Goal: Review and summary**

**Knowledge assessment questions: None for today**

**Following today's session:** Have participant's psychiatrist or case manager repeat these labs: Lipid profile, which includes total cholesterol, LDL, HDL, and Triglycerides, and a Heme A1C.

Discuss participants' progress in weight, exercise, and knowledge (both as a group and individually). Review problem areas and participant questions.

End with pages 38 of the Nutrition and Wellness section of the Solutions for Wellness manual (A Final Word) and page 38 of the Fitness and Exercise section of the Solutions for Wellness manual (Some Final Words).

## References

1. Ryan SW, Littrell KH, Sowers C, Peabody CD. *Solutions for wellness*. Indianapolis, IN: Eli Lilly; 2000.
2. Allison DB, Mentore JL, Heo M, et al. Antipsychotic-induced weight gain: a comprehensive research synthesis. *Am J Psychiatry*. Nov 1999;156(11):1686-1696.
3. Kinon BJ, et al. Data on file. *Janssen Pharmaceutica, Pfizer Inc*. 1998.
4. Jones. Data on file. *Janssen Pharmaceutica, Pfizer Inc*. 1999.
5. Barrett E, Mensing C, Horbowicz J, Siminerio L. Passing the torch at the international diabetes Federation. *Diabetes Care*. Apr 2004;27(4):1015-1016.
6. MacFarlane IA, Gill GV, Finnegan D, Pinkney J. Diabetes in a high secure hospital. *Postgrad Med J*. Jan 2004;80(939):35-37.
7. Ryan MC, Collins P, Thakore JH. Impaired fasting glucose tolerance in first-episode, drug-naive patients with schizophrenia. *Am J Psychiatry*. Feb 2003;160(2):284-289.
8. Gianfrancesco FD, Grogg AL, Mahmoud RA, Wang RH, Nasrallah HA. Differential effects of risperidone, olanzapine, clozapine, and conventional antipsychotics on type 2 diabetes: findings from a large health plan database. *J Clin Psychiatry*. Oct 2002;63(10):920-930.
9. Wirshing DA, Boyd JA, Meng LR, Ballon JS, Marder SR, Wirshing WC. The effects of novel antipsychotics on glucose and lipid levels. *J Clin Psychiatry*. Oct 2002;63(10):856-865.
10. Gianfrancesco F, White R, Wang RH, Nasrallah HA. Antipsychotic-induced type 2 diabetes: evidence from a large health plan database. *J Clin Psychopharmacol*. Aug 2003;23(4):328-335.
11. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults--The Evidence Report. National Institutes of Health. *Obes Res*. Sep 1998;6(Suppl 2):51S-209S.
12. Chan JM, Rimm EB, Colditz GA, Stampfer MJ, Willett WC. Obesity, fat distribution, and weight gain as risk factors for clinical diabetes in men. *Diabetes Care*. Sep 1994;17(9):961-969.
13. Colditz GA, Willett WC, Stampfer MJ, et al. Weight as a risk factor for clinical diabetes in women. *Am J Epidemiol*. Sep 1990;132(3):501-513.
14. Colditz GA, Willett WC, Rotnitzky A, Manson JE. Weight gain as a risk factor for clinical diabetes mellitus in women. *Ann Intern Med*. Apr 1 1995;122(7):481-486.
15. Willett WC, Manson JE, Stampfer MJ, et al. Weight, weight change, and coronary heart disease in women. Risk within the 'normal' weight range. *Jama*. Feb 8 1995;273(6):461-465.
16. Hubert HB, Feinleib M, McNamara PM, Castelli WP. Obesity as an independent risk factor for cardiovascular disease: a 26-year follow-up of participants in the Framingham Heart Study. *Circulation*. May 1983;67(5):968-977.
17. Rexrode KM, Hennekens CH, Willett WC, et al. A prospective study of body mass index, weight change, and risk of stroke in women. *Jama*. May 21 1997;277(19):1539-1545.
18. Stampfer MJ, Maclure KM, Colditz GA, Manson JE, Willett WC. Risk of symptomatic gallstones in women with severe obesity. *Am J Clin Nutr*. Mar 1992;55(3):652-658.
19. Cicuttini FM, Baker JR, Spector TD. The association of obesity with osteoarthritis of the hand and knee in women: a twin study. *J Rheumatol*. Jul 1996;23(7):1221-1226.
20. Loubé DI, Loubé AA, Mitler MM. Weight loss for obstructive sleep apnea: the optimal therapy for obese patients. *J Am Diet Assoc*. Nov 1994;94(11):1291-1295.
21. Huang Z, Hankinson SE, Colditz GA, et al. Dual effects of weight and weight gain on breast cancer risk. *Jama*. Nov 5 1997;278(17):1407-1411.

22. Schottenfeld D, Fraumeni JF. *Cancer Epidemiology and Prevention*. New York: Oxford University Press; 1996.
23. Lehman AF, Lieberman JA, Dixon LB, et al. Practice guideline for the treatment of patients with schizophrenia, second edition. *Am J Psychiatry*. Feb 2004;161(2 Suppl):1-56.
24. Services USDoHaH. Practical Guide to the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. *National Institutes of Health*. Available at: [http://www.nhlbi.nih.gov/guidelines/obesity/ob\\_gdlns.pdf](http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf). Accessed February, 2004.
25. Yanovski SZ, Yanovski JA. Obesity. *N Engl J Med*. Feb 21 2002;346(8):591-602.
26. Fanghanel G, Cortinas L, Sanchez-Reyes L, Berber A. A clinical trial of the use of sibutramine for the treatment of patients suffering essential obesity. *Int J Obes Relat Metab Disord*. Feb 2000;24(2):144-150.
27. Fujioka K, Seaton TB, Rowe E, et al. Weight loss with sibutramine improves glycaemic control and other metabolic parameters in obese patients with type 2 diabetes mellitus. *Diabetes Obes Metab*. Jun 2000;2(3):175-187.
28. Ryan DH. Use of sibutramine and other noradrenergic and serotonergic drugs in the management of obesity. *Endocrine*. Oct 2000;13(2):193-199.
29. Bray GA, Blackburn GL, Ferguson JM, et al. Sibutramine produces dose-related weight loss. *Obes Res*. Mar 1999;7(2):189-198.
30. McMahon FG, Fujioka K, Singh BN, et al. Efficacy and safety of sibutramine in obese white and African American patients with hypertension: a 1-year, double-blind, placebo-controlled, multicenter trial. *Arch Intern Med*. Jul 24 2000;160(14):2185-2191.
31. Heck AM, Yanovski JA, Calis KA. Orlistat, a new lipase inhibitor for the management of obesity. *Pharmacotherapy*. Mar 2000;20(3):270-279.
32. Davidson MH, Hauptman J, DiGirolamo M, et al. Weight control and risk factor reduction in obese subjects treated for 2 years with orlistat: a randomized controlled trial. *Jama*. Jan 20 1999;281(3):235-242.
33. Sjostrom L, Rissanen A, Andersen T, et al. Randomised placebo-controlled trial of orlistat for weight loss and prevention of weight regain in obese patients. European Multicentre Orlistat Study Group. *Lancet*. Jul 18 1998;352(9123):167-172.
34. Dursun SM, Devarajan S. Clozapine weight gain, plus topiramate weight loss. *Can J Psychiatry*. Mar 2000;45(2):198.
35. Littrell KH, Petty RG, Hiligoss NM, Peabody CD, Johnson CG. Weight loss with topiramate. *Ann Pharmacother*. Sep 2001;35(9):1141-1142.
36. Gordon A, Price LH. Mood stabilization and weight loss with topiramate. *Am J Psychiatry*. Jun 1999;156(6):968-969.
37. Norton J, Potter D, Edwards K. Sustained weight loss with topiramate. *American Journal of Psychiatry*. 1997;38(Suppl 3):58.
38. Chengappa KN, Levine J, Rathore D, Parepally H, Atzert R. Long-term effects of topiramate on bipolar mood instability, weight change and glycemic control: A case-series. *European Psychiatry*. 2001;16:186-190.
39. Behar D, Schaller JL. Topiramate leukopenia on clozapine. *Eur Child Adolesc Psychiatry*. Feb 2004;13(1):51-52.
40. Morrison JA, Cottingham EM, Barton BA. Metformin for weight loss in pediatric patients taking psychotropic drugs. *Am J Psychiatry*. Apr 2002;159(4):655-657.
41. Bailey CJ, Turner RC. Metformin. *N Engl J Med*. Feb 29 1996;334(9):574-579.

42. Baruch R, Poulin M, Thakur A, Karangianis J, Raskin J. Amantadine induces weight loss in patients treated with olansapine. *Schizophrenia Research*. 2002;53(3 Suppl 1):159.
43. Sacchetti E, Guarneri L, Bravi D. H(2) antagonist nizatidine may control olanzapine-associated weight gain in schizophrenic patients. *Biol Psychiatry*. Jul 15 2000;48(2):167-168.
44. Breier A, Tanaka Y, Roychowdhurym S, Clark WS. Nizatidine for the prevention of olanzapine-associated weight gain in schizophrenia and realated disorders-a randomized controll double-blind study. Paper presented at: 41st New Clinical Drug Evaluation Unit, 2001; Phoenix, AZ.
45. Schiefler P. Partnership for recovery: (Available from Center for Excellence in Psychiatry, University Behavioral Healthcare, 151 Centennial Avenue, Suite 1500, Piscataway, NJ, 08854); 2002.

## Appendix A

### BMI Index Table

Find height on left-hand side, move to the right until you come to weight, look at the top row for the corresponding BMI.

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Height (inches)	Weight (pounds)																
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287

BMI	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Height (inches)	Weight (pounds)																		
58	172	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258
59	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267
60	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276
61	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285
62	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295
63	203	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304
64	209	215	221	227	234	238	244	250	256	262	267	273	279	285	291	296	302	308	314
65	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324
66	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334
67	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344
68	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354
69	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365
70	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376
71	257	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386
72	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397
73	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408
74	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420
75	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431
76	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443

## Appendix B

### Knowledge Assessment

#### Sessions 2 and 3:

1. Why must we eat?
  - a. To be socially accepted
  - b. To gain fuel and energy to make our bodies run
  - c. To maintain unhealthy eating habits
  - d. None of the above
  
2. How many servings of fruits and vegetables do we need each day?
  - a. 1-3
  - b. 2-4
  - c. 3-5
  - d. 6-11
  
3. How many servings of meats do we need each day?
  - a. 1-3
  - b. 2-4
  - c. 3-4
  - d. 5-6

#### Session 4:

4. Why is fiber important?
  - a. Maintains proper bowel movement
  - b. Naturally alleviates constipation
  - c. Very filling
  - d. All of the above

#### Session 5:

True or False:

- \_\_\_\_\_ 5. Including water in your diet is not important.
6. What is the recommended amount of water we should drink each day?
    - a. 6 glasses
    - b. 8 glasses
    - c. 10 glasses
    - d. 12 glasses
  
  7. How much water is recommended when we participate in regular exercise?
    - a. 6-8 glasses
    - b. 3-5 glasses
    - c. 9-13 glasses
    - d. 15-20 glasses

**Session 7:**

8. Extra cholesterol is obtained from:
- a. Egg yolks
  - b. Meat
  - c. Higher fat milk products
  - d. All of the above

True or False:

- \_\_\_\_\_ 9. The body does not make all the cholesterol it requires.
- \_\_\_\_\_ 10. We should never eat foods that contain fat.

**Session 9:**

11. Which of the following is the best definition of diabetes?
- a. A diet consisting of too much sugar
  - b. A diet that helps you to lose weight
  - c. A medical condition where the body cannot break down sugar in the blood
  - d. All of the above
12. A major problem arising from eating a diet high in sugar is:
- a. Tooth decay
  - b. Sticky fingers
  - c. Bad breath
  - d. All of the above

**Session 12:**

13. How much salt does the average person need?
- a. 24 mg per day
  - b. 240 mg per day
  - c. 2,400 mg per day
  - d. 24,000 mg per day

**Session 14:**

14. Consumption of alcohol can lead to:
- a. Increased risk of stroke
  - b. Heart disease
  - c. Damage to the liver
  - d. All of the above

True or False:

- \_\_\_\_\_ 15. Alcohol and coffee are good sources of fluids.

**Knowledge Assessment – Answer Key**

1. b
2. b
3. b
4. d
5. F
6. b
7. c
8. d
9. F
10. F
11. c
12. a
13. c
14. d
15. F

## Appendix C

### Portion Size Guide

<b>Portion Guide</b>	
Serving of pasta or rice (½ cup)	1 cupped hand/baseball
Serving of green salad (1 cup)	2 cupped hands
Serving of meat (3 oz)	Deck of cards
Serving of salad dressing (2 Tbsp)	Small thumb
Ice cream	One scoop
Butter/margarine (1 tsp)	Tip of your thumb
Grapes, cherries, berries (1 cup)	Handful
Medium fruit (banana, orange, apple)	Whole piece
Bread	1 slice
Crackers	4-6 small crackers
French fries	10 French fries
Cheese (1 oz)	2 dominos
Hard roll (1.5 oz)	Bar of soap
Nuts (1 oz)	2 shot glasses full
Chocolate (1 oz)	Package of dental floss
Sour cream (¼ cup)	Golf ball
Oil (1 tsp)	thimble