ABSTRACT

Weight gain and type 2 diabetes have been noted with the use of some atypical antipsychotic medications. A number of interventions, both pharmacologic and nonpharmacologic, have been employed by nurses to help patients manage antipsychotic drug-induced weight gain. Pharmacologic strategies include the use of adjunctive medications (which increases the risk for drug-drug interactions) or medication switching. Nonpharmacologic strategies have been used to induce weight loss and to prevent weight gain. Several studies have shown that comprehensive nutrition and exercise education programs can be effective weight management tools for patients with schizophrenia. However, time constraints are often listed as one of the biggest obstacles for nurses to teach patients about healthy lifestyle interventions. Psychoeducational methods that seek to provide information in short “spurts” of time are being used to reinforce diet and exercise information and maintain motivation. In addition to weight management, risk factors for type 2 diabetes should be assessed in all patients taking atypical antipsychotic medications; this screening process should include evaluation for the metabolic syndrome. Moreover, nurses must monitor for the signs and symptoms of type 2 diabetes. This article offers practical information for nurses to use in providing weight management strategies for patients receiving antipsychotic medications. Examples include methods for visual and verbal teaching and responses to excuses. Risk factors for type 2 diabetes, common signs and symptoms of type 2 diabetes, and the metabolic syndrome are reviewed. (Adv Stud Nurs. 2004;2(3):101-109)

The nursing process traditionally follows the paradigm of assessment, diagnosis, planning, intervention, and evaluation. Overall, nurses regard patients and care planning through the framework of this process and usually approach the problem of antipsychotic drug–induced weight gain with the same strategy. Several health risks are associated with weight gain, including diabetes, dyslipidemia, osteoarthritis, heart disease, and certain types of cancers. Although the medical comorbidities are well known, many are not directly measurable in a nursing practice setting. Thus, nurses are faced with the challenge of educating patients on the long-term risks of weight gain without having “proof” to show the patient.

In order to identify patients at risk for these comorbidities and begin a treatment plan, baseline parameters must be established. These parameters should include blood pressure measurement, laboratory tests (ie, blood glucose and lipid levels), and body mass index (BMI), which is calculated using weight and height measurements (Figure 1). It is helpful to have a
BMI chart on the wall for the patient to see as well. Nurses can ask patients to find their BMI on the chart using their own height and weight information, thus reinforcing the “diagnosis” of overweight or obesity, both verbally and visually. After an accurate assessment, an appropriate plan for managing or preventing weight gain can be determined.

**Pharmacologic Strategies**

In the United States, there are 2 types of pharmacologic interventions used to manage antipsychotic drug-induced weight gain: (1) adding an adjunctive medication to induce weight loss or (2) switching medications. Although several adjunctive medications have been reported in the literature, only 3 are approved by the US Food and Drug Administration for weight loss: phentermine, sibutramine, and orlistat. Despite the popularity of adjunctive treatment, each additional medication also has an additional panel of side effects, which are often heightened in psychiatric patients. The risk of drug-drug interactions is also present; hence, nurses must completely review any concomitant medications for potential psychiatric and physical effects.

A second pharmacologic strategy involves switching the prescribed antipsychotic agent to one that is not associated with weight gain. In a recent 8-week study, Casey and colleagues noted significant weight loss among patients switched from olanzapine or risperidone to aripiprazole (Figure 2). Clearly, the degree of symptom control needs to be reassessed during a medication switch so that psychiatric stability is not compromised for the sake of preventing or reversing weight loss.

**Nonpharmacologic Interventions**

Nonpharmacologic interventions have been used to help patients lose weight they have gained and help patients prevent weight gain with known offending agents.

**Weight Loss Studies**

Several studies have shown weight loss among patients taking antipsychotic medications. Although there are variations in the exact nature of the programs utilized, all sought to implement changes in exercise and eating patterns. Wirshing and colleagues were among the first to report the benefits of nonpharmacologic interventions. In their study, patients were instructed to weigh themselves and report their weight to the nurse specialist at each visit (every 1 to 4 weeks). If this feedback did not keep weight gain to less than 10 lb, patients were asked to keep a detailed food diary for 1 week. If this failed to prevent weight gain or encourage
weight loss, patients were referred to a clinical nutritionist or the Wellness Center, which offered a comprehensive program on dietary and exercise habits with group support. As shown in Figure 3, weight loss was achieved among all of the antipsychotic medication–treated groups except those taking clozapine. More recently, Vreeland and colleagues reported a 12-week weight control program that incorporated nutrition, exercise, and behavioral interventions. Patients who participated in the program had a mean weight loss of 6 lb compared with a mean weight gain of 6.4 lb in the control group.3

Studies have also found the Weight Watchers® program to be effective in psychiatric patients. The results show average weight losses of 5 to 7 lb in 2 to 3 months (Table 1).4-6 Unfortunately, many psychiatric patients do not have the money to pay the fees for programs such as Weight Watchers, and travel to the meetings can itself be a significant challenge.

O’Keefe and colleagues studied the behaviors of 35 patients who had gained at least 20 lb from antipsychotic medications and proceeded to lose 10 lb or more.7 The most frequent interventions were regular meetings with a nutritionist (42.9%), self-directed diet (28.6%), and weight loss as a treatment goal (25.7%). At the point of maximum weight gain, patients had gained a mean of 64.73 lb over 53 months. At the point of greatest weight loss, they were 23.94 lb above their baseline weight. Their final weight at the end of the study was a mean of 32.65 lb above baseline weight.

**Preventing Weight Gain**

Many patients who experience significant weight gain with antipsychotic medications would like to avoid this side effect altogether. One of the challenges for nurses in inpatient settings is the limited time of exposure to patients; our average inpatient stay is 5 days. Wirshing and colleagues developed a 30-minute presentation to inpatients, emphasizing the importance of maintaining healthy weight, proper food choices, managing hunger, and beginning an exercise program. They found, however, that although the vast majority (70%) of patients expressed a desire to lose weight, only 33% ate meals in their own home, 30% are meals in a fast-food restaurant, and 60% said they rarely or never cooked.8 Nurses in the acute-care setting can use that opportunity to assess readiness to implement weight management strategies and the impediments to such strategies.

Time constraints during office visits are often quoted by healthcare professionals as one of the biggest obstacles to approaching the weight issue. Nguyen and colleagues showed that over 11 visits, the sum total of 27 minutes of discussion with the patient resulted in half the weight gain seen in patients who never dis-

---

**Figure 3. Behavioral Interventions Can Reduce Weight Gain from Antipsychotic Medications**

1 kg = 2.2 lb.

Patients were asked to proceed through a stepwise treatment plan if they gained more than 10 lb after starting antipsychotic medication. Behavioral treatments included weigh-ins, food diary, nutritionist consultation, and participation in the Wellness Center.

Data from Wirshing et al.7

---

**Table 1. Study Results with Weight Watchers® in Psychiatric Patients**

<table>
<thead>
<tr>
<th>University of Maryland</th>
<th>Fountain House</th>
<th>Yale University</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-week Weight Watchers</td>
<td>12-week Weight Watchers in a clubhouse setting</td>
<td>10-week Weight Watchers in controlled mental healthcare setting</td>
</tr>
<tr>
<td>and supervised exercise program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average weight loss, 7.31 ± 5.87 lb</td>
<td>Average weight loss, 2.78 kg</td>
<td>Average weight loss, 5.5 ± 3.5 lb</td>
</tr>
<tr>
<td>Men did better than women in this program</td>
<td>70% average weekly attendance rate</td>
<td></td>
</tr>
</tbody>
</table>

1 kg = 2.2 lb.
cussed weight. In this study, doctors outlined 8 points of healthy eating during a 5-minute discussion at the start of therapy: warning of appetite increase and potential weight gain, avoiding carbohydrates and fried fatty foods, drinking more water and diet sodas, eating more frequently but in smaller portions, snacking on healthy food, and walking 3 times per week. At each follow-up visit, patients were given a 2-minute reminder that emphasized eating smaller portions, avoiding fast foods, and walking. This verbal counseling strategy resulted in a weight gain of approximately 5 lb over the 3-month period.

Our group conducted a large study of 70 patients who were randomized at the initiation of antipsychotic therapy to receive either the Solutions for Wellness® program or standard care for 6 months. Solutions for Wellness involved a weekly 1-hour class for 4 months. The program is targeted at patients with schizophrenia and covered nutrition, fitness, and exercise. It included frequent group work and patient participation in these classes. Standard care included a weigh-in at each visit and verbal counseling by the research nurse and physician. Patients’ weight and BMI were measured and recorded monthly. At 4 months and 6 months (ie, 2 months after the program ended), those participating in the Solutions for Wellness program experienced virtually no weight gain and began to show weight loss, whereas those who received standard care gained up to 10 lb (Figure 4). Most surprising was the difference between men and women in the study (Figure 5).11

IMPLEMENTING LIFESTYLE MODIFICATION PRINCIPLES

Clearly, the presence of antipsychotic drug–induced weight gain should prompt immediate intervention. In the general population, the American Diabetes Association (ADA) and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) indicate that weight loss (5% to 10% of body weight) and physical activity (at least 30 minutes daily) should be the first-line intervention to prevent or delay diabetes. However, losing weight and exercising is difficult for just about everyone. Those who need to take antipsychotic medication face additional challenges. By making treatment recommendations simple and specific, the likelihood increases that strategies will be implemented.

The first step in managing antipsychotic drug–induced weight gain is to reduce daily caloric intake. A 500-kcal per day reduction equals 1 lb of weight loss per week. Specific illustrations of ways to decrease caloric intake may be helpful. For example, a can of soda is 140 kcal; by removing 2 cans of soda per day, 280 kcal will be removed from the diet, resulting in a weight loss of 0.5 lb per week. The food pyramid can also be used to teach portion control. A chart may be useful for patients to check off the number of servings they have each day (Figure 6). This type of chart...
can be hung on the refrigerator and makes it easy for the patient to keep track of food intake. Portion size for the different food groups needs to be emphasized and can be taught using visual cues—3 to 4 oz of meat is about the size of the palm of a hand, 1 oz of cheese is about the size of a thumb, 1 cup is about the size of a baseball. Reading food labels is also essential, especially as the serving container can be very misleading regarding number of portions included.

Dealing with hunger and nocturnal cravings are common problems in patients with schizophrenia. One useful tactic is to divide the daily food allowance into 6 smaller meals per day, including a bedtime snack. This strategy may help to prevent nighttime binges. Increasing water intake can also promote a feeling of fullness. The addition of sugar-free juice mixes to the water can make consumption more inviting. The other advantage to these types of drinks is their low price (about $0.09 to $0.11 per serving).

Controlling diet is only one piece of overall weight management; exercise and physical activity must also be considered. There are many obstacles to increasing physical activity among patients with mental illness (eg, symptoms, financial limitations, and self-imposed excuses). Table 2 offers some possible responses to common excuses for inactivity. Walking is probably the most effective and easiest to incorporate exercise for the mentally ill. It is a no-cost exercise that can be done virtually any time of the year. As with food, patients need to be given simple and specific instructions for duration. For example, the nurse can tell the patient to walk from his or her house to a landmark and back, such that the distance will equal 2 miles; or, patients should walk for 15 minutes, then turn around and return. Mentally ill patients often are not good judges of distances, so the concept of 2 miles needs to be given in terms they understand. Patients should also understand that they need to walk briskly (ie, being slightly out of breath, pretending like they are late for a meeting). An afternoon stroll is not the type of exercise needed for losing weight. The Sidebar

### Table 2. Overcoming Excuses for Inactivity

<table>
<thead>
<tr>
<th>The patient says...</th>
<th>You respond...</th>
</tr>
</thead>
</table>
| I’m too tired, need to relax. | • Exercise can actually help you relax by relieving stress. This, in turn, makes you feel good.  
• It can also boost your energy and make you feel less tired. You’ll probably find you’ll sleep better too! |
| Exercise is boring. | Try a variety of activities and chose one that is fun and sociable.  
• Options such as line dancing, mall walking clubs, or shooting hoops are great ways to meet people, be active, and have fun!  
• Vary your walking route to keep it fun. |
| No time...I’m too busy. | • Just a total of 30 minutes, most days of the week, can make a real difference to your health.  
• You don’t have to do it all at once; try 2 sessions of 15 minutes. |
| I won’t have any clothes that fit if I lose weight! | • Go to a local clothes closet.  
• Go to resale or thrift stores.  
• Find sales at low-cost department stores. |
below offers specific examples of both sporting activities and common chores that can qualify as moderate physical activity. As with other forms of patient education, however, the examples should be specific and concrete (e.g., walk up and down the stairs 10 times at 4:30 PM; do 3 sets of 10 squats during the commercial breaks of a favorite television show; walk in place for 20 minutes at 11:00 AM). Nurses can also write a “prescription” (give written directions) for the exercise, reinforcing its importance and giving the patient an information sheet with the specific instructions.

### Identifying Risk Factors for Type 2 Diabetes

In January 2003, the ADA and the NIDDK published their joint physician statement on the prevention and delay of type 2 diabetes. They identified the risk factors for type 2 diabetes, among which is the presence of overweight and obesity. The criteria for impaired fasting glucose, another risk factor, was recently changed. In November 2003, the Expert Committee on the Diagnosis and Treatment of Diabetes lowered the threshold for impaired fasting glucose level, from 110 mg/dL to 100 mg/dL. So, a fasting glucose level between 101 mg/dL and 125 mg/dL is now considered to be impaired and is a risk factor for diabetes (Table 3). Other risk factors are easily determined during a routine history (see Sidebar, page 107). Every nurse should be familiar with them. The ADA offers an online diabetes risk test (www.diabetes.org), which can be taken online or printed.

Nurses also need to assess for the signs and symptoms of type 2 diabetes, many of which can masquerade as medication-induced side effects. For example, fatigue and blurred vision are commonly associated with psychotropic agents but can also be early indicators of type 2 diabetes. Other signs and symptoms of diabetes include weakness, polyuria, nocturia, excessive thirst, and recent weight loss. If patients present with these known signs and symptoms, the nurse should immediately consider the presence of diabetes and not automatically attribute them to prescribed medications.

### Table 3. Diagnostic Thresholds for Diabetes and Impaired Glucose Tolerance

<table>
<thead>
<tr>
<th>Glucose Level (mg/dL)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Fasting plasma glucose upper limit of normal</td>
</tr>
<tr>
<td>126</td>
<td>Fasting plasma glucose diagnostic of diabetes*</td>
</tr>
<tr>
<td>140</td>
<td>Random plasma glucose suggests need for further evaluation</td>
</tr>
<tr>
<td>200</td>
<td>Random plasma glucose diagnostic of diabetes†</td>
</tr>
</tbody>
</table>

*With confirmation on a subsequent day.
†With symptoms, requires confirmation on a separate day unless severely hyperglycemic.
Data from Genuth et al.12
RECOGNIZING METABOLIC COMPLICATIONS

There are several common laboratory tests used to screen for metabolic complications with which nurses need to be familiar. These include fasting plasma glucose (normal, 65 to 99 mg/dL), fasting insulin (normal, 6.0 to 27.0 µU/mL), glycosylated hemoglobin or HbA1c (normal, ≤6%), and fasting lipids (normal: high-density lipoprotein [HDL] cholesterol, ≥35 mg/dL; triglycerides, ≤250 mg/dL). Of note, HbA1c levels are not diagnostic of type 2 diabetes; these levels should be used only for clinical evaluation and monitoring in people who have a diagnosis of diabetes. Nurses should understand the laboratory values and tests needed to screen for metabolic disturbances and should monitor these levels at regular intervals to evaluate the effects of behavioral and pharmacologic interventions.

The metabolic syndrome was recently defined by the Third Adult Treatment Panel of the National Cholesterol Education Program. It is defined by low levels of HDL cholesterol, abdominal obesity, high triglyceride levels, hypertension, and impaired glucose tolerance (see Table 1 in Dr Petty’s article, page 86). This may be modified in the near future to reflect the new ADA definition of impaired glucose tolerance (ie, <100 mg/dL) and perhaps new information on lipid levels. For the healthcare professional, it is important to realize that the metabolic syndrome is not visually observable. It must be assessed for, and it is often a precursor to type 2 diabetes.

CONCLUSION

Patients with schizophrenia are at increased risk for obesity, diabetes, dyslipidemia, cardiovascular disease, and medical illness. The metabolic adverse effects of some atypical antipsychotic medications may impose additional medical burden on this high-risk population. Recognition and management of metabolic problems are important areas in the overall care of our patients. Psychiatric nurses can provide simple and specific instructions and examples to increase the chances of success in minimizing metabolic side effects and assess for these metabolic disorders at every visit.

Risk Factors for Type 2 Diabetes

- First-degree relative with diabetes
- Overweight (BMI ≥25 kg/m²)
- ≥45 years of age
- Habitual physical inactivity
- Member of a high-risk ethnic population
  – African American, Latino, Native American, Asian American, Pacific Islander
- Previously identified prediabetes (impaired fasting glucose or impaired glucose tolerance)
- Hypertension (≥140/90 mm Hg)
- HDL cholesterol ≤35 mg/dL and/or triglycerides ≥250 mg/dL
- History of gestational diabetes or delivery of infant weighing >9 lb
- Acanthosis nigricans
- Polycystic ovarian syndrome
- History of vascular disease

BMI = body mass index; HDL = high-density lipoprotein.

Key Points

- Assess for comorbidities of weight gain and diabetes with baseline measurements of blood pressure, blood glucose levels, cholesterol levels, and BMI.
- Place a BMI chart on the wall and have the patient find his or her own BMI, helping to reinforce the diagnosis.
- Weight management should be an aspect of treatment when patients are receiving medications with weight gain as a known side effect.
- Weight loss and weight gain prevention programs that teach nutrition and exercise have been shown to be beneficial.
- Make nutrition and exercise recommendations simple and specific.
- Write the recommendations down. Write a “prescription” for exercise.
- Nurses should know the risk factors for diabetes and assess for the signs and symptoms in all patients taking antipsychotic medications.
- Signs and symptoms of type 2 diabetes are often confused with medication side effects.
- The metabolic syndrome is often a precursor to diabetes and should also be assessed for.

DISCUSSION

ENSURING PATIENTS UNDERSTAND THE RECOMMENDATIONS

Dr Margolis: I’m very impressed with the specificity of your recommendations and the effectiveness of
the behavioral intervention in your study. However, most schizophrenic patients don’t understand much, so how are they able to follow these types of directions?

**Ms Littrell:** That’s why the recommendations are very concrete, very specific. And our instructions are all written down. I would never teach patients like I am teaching other nurses. It all has to be written down in language that they can understand. Our materials are essentially written at a 5th-grade level. Some of our patients who became ill while they were in college say, “Wow, this is so simplistic.” And I reply, “Wow, do you do it?” So, writing down the plan is helpful in terms of addressing the underlying cognitive deficit in people with schizophrenia; word recognition and reading remain intact. These are the only areas where they don’t show cognitive impairment. So, if literacy is not a problem, then write it down. Also, this is not specific to patients who are on atypical antipsychotic medications. In patients who are on older medications, the decanoates, this work has been replicated in a number of centers around the United States as well as in a couple of other countries.

**Dr Petty:** This is absolutely crucial for our understanding of why so many programs have not worked. We have 3 ways of learning: verbal, visual, and kinesthetic. Within the verbal method, ability to read is maintained. Their visual and kinesthetic abilities for learning remain. We have found, for example, that if you are discussing portion sizes, have the patient hold it in their hand [eg, a baseball to show 1 cup]. That is very helpful.

**Ms Littrell:** When we invested a lot of money in the food models from the American Dietetic Association, the patients still didn’t get it. You need to actually weigh and measure food and show them, for example, what 10 grapes look like. A serving of grapes is not a whole stem. We know that in at least 10 domains, our patients are moderately to severely impaired. Three standard deviations from the norm is a major impairment. If any of us were 3 standard deviations from the norm, we couldn’t do our jobs, we couldn’t find our way into this room. Harvey and Keefe noted that the only 2 areas in which our patients did not show impairment were word recognition/reading and long-term factual memory.13 So, for me, that made a lot of sense as to why my patients can tell me whom they went to the prom with when they were 16 years of age but they don’t remember the name of the doctor they saw in the mental health center last week.

**Dr Petty:** We also use perimeter shopping. If you walk into the supermarket and turn right, and just keep walking what do you see? The vegetables, the dairy section—the healthy food. You avoid all of the junk food.

**Ms Littrell:** Those kinds of activities are helpful, but not often possible in state hospitals.

### Motivating Patients

**Dr Petty:** We have found that patients become empowered and motivated once we put them on the neural medicines, because they now understand the enormity of what they are facing. I remember one patient in particular, who was just “waiting for the rapture.” This patient was diabetic and developing retinopathy. I said, “Well it’s not going to do you much good if you can’t see it, is it?” When we switched his medication to an atypical antipsychotic drug, his cognition improved and he is now adherent to the lifestyle changes. He is caring for himself. But this is not a single case; this is something we have been describing and looking into in great detail.

**Dr Margolis:** These strategies can make an enormous impact on general psychiatric nursing care, not just with use of antipsychotic medications.

**Ms Littrell:** The majority of medications that we use in psychiatry (mood stabilizers, many antidepressants) have weight gain as a liability. For the most part, psychiatric patients are on multiple medications at the same time. I don’t know anybody that is on antipsychotic monotherapy in our facility. So, we have the impact of multiple psychiatric medicines, and in people with medical comorbidities who may be on other medications, the potential for weight gain can be enormous.

### REFERENCES


4. Ball MP, Coons VB, Buchanan RW. A program for treating
olanzapine-related weight gain. Psychiatr Serv. 2001;52(7):967-969.