**Appendix F. Study Characteristics Table**

Table F-1. Study characteristics table for SMI comparative effectiveness reviewa

| **Study**  **Country**  **Randomized Patients (N)** | **Patient Characteristics** | **Intervention** | **Comparator** | **Outcomes**  **Timing** | **Effectiveness  Rating**  **Funding** | **Study Quality:**  **Hard Outcomes**  **Soft Outcomes** |
| --- | --- | --- | --- | --- | --- | --- |
| Alvarez-Jimenez, 2006[1](#_ENREF_1)  Europe  61 | Mean age: 26.8  Female N: 15  Male N: 46  Nonwhite: NR  Schizophrenia N: 61  Bipolar N: NR  Other N: NR | Early behavioral intervention:  10–14 weekly or twice weekly individual therapy sessions following a flexible but manualized program, provided by a master's-level psychologist, focused on education, motivation, and skills training to enhance control over factors associated with antipsychotic weight gain. | Enhanced usual care "designed to provide patients with the same physical care that is offered in a comprehensive early psychosis program." | BMI  Weight (kg)  3 months, 4 months, 6 months, 12 months, 24 months | Mixed (4)  Marques de Valddecilla Public Foundation– government | Good  NA |
| Assuncao, 2006[2](#_ENREF_2)  South America  54 | Mean age: 35.2  Female N: 22  Male N: 32  Nonwhite: 18  Schizophrenia N: 54  Bipolar N: 0  Other N: 0 | Nizatidine 600 mg/day  All participants were continued on their pretrial dose of olanzapine (5-20 mg/day). | Placebo  All participants were continued on their pretrial dose of olanzapine (5-20 mg/day). | Weight (kg)  Total Cholesterol (mg/dl)  LDL (mg/dl)  Discontinuation due to adverse event  "Treatment emergent adverse event"  Psychiatric Symptom Severity: BPRS  4 weeks, 8 weeks, 12 weeks | Efficacy (2)  Industry | Good  Good |
| Atmaca, 2003[3](#_ENREF_3)  Europe  35 | Mean age: 27.9  Female N: 14  Male N: 21  Nonwhite: NR  Schizophrenia N: 35  Bipolar N: N:NR  Other N: NR | Nizatidine 300 mg/day  All participants were continued on their pretrial dose of olanzapine. | Placebo  All participants were continued on their pretrial dose of olanzapine. | BMI  Weight (kg)  Psychiatric Symptom Severity: PANSS  Any adverse event  8 weeks | Efficacy (0)  Not reported or unclear | Fair  Fair |
| Atmaca, 2004[4](#_ENREF_4)  Europe  28 | Mean age: 30.2  Female N: 12  Male N: 13  The sex of the 3 participants who did not complete the study was not reported.  Nonwhite: NR  Schizophrenia N: 28  Bipolar N: NR  Other N: NR | Quetiapine 300 - 750 mg/day (mean dose 479 mg/day) + nizatidine 300 mg/day | Quetiapine 300 - 750 mg/day (mean dose 493 mg/day) + placebo | BMI  Weight (kg)  Psychiatric Symptom Severity: PANSS  Leptin levels  2 months | Efficacy (0)  Not reported or unclear | Fair  Fair |
| Ball, 2011[5](#_ENREF_5)  US  36 | Mean age: 47.0  Female N: 11  Male N: 25  Nonwhite: 11  Schizophrenia N: 36  Bipolar N: NR  Other N: NR | Atomoxetine 120 mg/day  All participants attended weekly group counseling, exercise sessions 3 times per week, and 10 weeks of Weight Watchers.  All participants were continued on their pretrial dose of clozapine or olanzapine. | Placebo  All participants attended weekly group counseling, exercise sessions 3 times per week, and 10 weeks of Weight Watchers.  All participants were continued on their pretrial dose of clozapine or olanzapine. | Weight (kg)  LDL (mg/dl)  9 weeks, 24 weeks, 6 months | Mixed (4)  Government, Industry | Fair  Fair |
| Borba, 2011[6](#_ENREF_6)  US  20 | Mean age: 51.1  Female N: 7  Male N: 13  Nonwhite: 2  Schizophrenia N: 20  Bipolar N: NR  Other N: NR | Ramelteon 8 mg/day  All participants were continued on their pretrial medications. | Placebo  All participants were continued on their pretrial medications. | BMI  Weight (kg)  HbA1c (%)  Total cholesterol (mg/dl)  LDL (mg/dl)  2 months | Efficacy (0)  Government, Industry | Fair  NA |
| Brar, 2005[7](#_ENREF_7)  US  71 | Mean age: 40.3  Female N: 42  Male N: 29  Nonwhite: 36  Schizophrenia N: 71  Bipolar N: 0  Other N: 0 | 20 manualized behavioral therapy sessions, twice weekly for 6 weeks followed by weekly for 8 weeks, covering diet, nutrition, exercise, and self-monitoring of behavioral changes. | Usual care | BMI  Weight (kg)  Systolic blood pressure (mmHg)  Diastolic blood pressure (mmHg)  14 weeks | Efficacy (1)  Industry | Fair  Fair |
| Brown, 2011[8](#_ENREF_8)  US  89 | Mean age: 44.6  Female N: 54  Male N: 35  Nonwhite: 35  Schizophrenia N: NR  Bipolar N: NR  Other N: NR | Recovering Energy Through Nutrition and Exercise for Weight Loss (RENEW): weekly individual visits for 12 weeks followed by monthly individual visits and weekly phone calls for the following 3 months. Sessions focused on weight loss strategies including social support, goal setting, skills training, and compensatory strategies for cognitive impairments. | Usual care | Weight (lb)  3 months, 6 months | Efficacy (1)  Government, Industry | Fair  Fair |
| Bustillo, 2003[9](#_ENREF_9)  US  30 | Mean age: 34.5  Female N: 6  Male N: 24  Nonwhite: 15  Schizophrenia N: 30  Bipolar N: NR  Other N: NR | Olanzapine 10 mg/day plus fluoxetine 20-60 mg/day (mean dose 56 mg/day) | Olanzapine 10 mg/day plus  placebo | Weight (kg)  Psychiatric Symptom Severity: PANSS-Positive Symptoms  Psychiatric Symptom Severity: HAM-D  Adverse Event: Extrapyramidal symptoms  4 months | Efficacy (2)  Government, Industry | Fair  Fair |
| Carrizo, 2009[10](#_ENREF_10)  South America  61 | Mean age: 38.9  Female N: NR  Male N: NR  Nonwhite: 50  Schizophrenia N: 52  Bipolar N: 2  The numbers for diagnoses are based on the number of individuals who completed the trial, which was 54. 61 were randomized  Other N: NR | Metformin 500-1000 mg/day  All participants continued taking their pretrial clozapine, although it was unclear if dosing was changed during the trial. Mean starting dose of clozapine for intervention arm was 180 mg/day. | Placebo  All participants continued taking their pretrial clozapine, although it was unclear if dosing was changed during the trial. Mean starting dose of clozapine for placebo arm was 207 mg/day. | BMI  Weight (kg)  HbA1c (%)  Systolic blood pressure (mmHg)  Diastolic blood pressure (mmHg)  Psychiatric Symptom Severity: BPRS  7 weeks, 14 weeks | Efficacy (1)  Government, Industry | Fair  Fair |
| Cavazzoni, 2003[11](#_ENREF_11)  US  175 | Mean age: NR  Female N: NR  Male N: NR  Nonwhite: NR  Schizophrenia N: 169  Bipolar N:NR  Other N: NR  175 randomized, 169 completed and analyzed. | This was a 3-arm trial with 2 active arms.  Arm 1: Pretrial dose of olanzapine plus nizatidine 300 mg/day  Arm 2: Pretrial dose of olanzapine plus nizatidine 600 mg/day | Pretrial dose of olanzapine + placebo | Weight (lb)  Psychiatric Symptom Severity: BPRS  1, 2, 3, 4, 5, 6, 8, 12, and 16 weeks | Efficacy (1)  Industry | Fair  Poor |
| Deberdt, 2008[12](#_ENREF_12)  US  133 | Mean age: 44.0  Female N: NR  Male N: NR  Nonwhite: NR  Schizophrenia N: 133  Bipolar N: 0  Other N: 0 | Antipsychotic switching:  FROM olanzapine 10-20 mg/day  TO quetiapine 300-800 mg/day | CONTINUE olanzapine 10-20 mg/day  Comparators were continued on olanzapine although the dose of olanzapine could be changed during the trial. | BMI  Weight (kg)  HbA1c (%)  Total cholesterol (mmol/L)  LDL (mmol/L)  1, 2, 3, 5, 7, 10, 12, 16, 18, 22, and 24 weeks | Mixed (5)  Industry | Fair  Fair |
| Elmslie, 2006[13](#_ENREF_13)  Australia/New Zealand  60 | Mean age: 42.0  Female N: 49  Male N: 11  Nonwhite: NR  Schizophrenia N: NR  Bipolar N:60  Other N: NR | Carnitine L-tartrate 15 mg/kg/day | Placebo control | BMI  Weight (kg)  Waist circumference change (cm)  26 weeks | Mixed (3)  Private foundation | Good  Good |
| Evans, 2005[14](#_ENREF_14)  Australia/New Zealand  51 | Mean age: 34.2  Female N: 29  Male N: 22  Nonwhite: NR  Schizophrenia N: 38  Bipolar N: 8  Other N: 5 | Nutrition education: 6 planned, 1 hour contacts including education on diet, nutrition, physical activity, and exercise and assistance in goal setting, provided every 2 weeks by an accredited practicing dietitian. | Usual care | BMI  Weight (kg)  3 months, 6 months | Efficacy (1)  Industry | Poor  Poor |
| Fleischhacker, 2010[15](#_ENREF_15)  Europe, Africa  207 | Mean age: 39.0  Female N: 73  Male N: 134  Nonwhite: 10  Schizophrenia N: 207  Bipolar N: 0  Other N: 0 | Aripiprazole 5–15 mg/day; mean dose = 11.1 mg/day  All participants were continued on their prestudy dose of clozapine throughout the trial. | Placebo  All participants were continued on their prestudy dose of clozapine throughout the trial. | BMI  Weight (kg)  Total Cholesterol (mg/dl)  LDL (mg/dl)  Discontinuation due to adverse event  All-cause mortality  HRQOL/Physical function: Subjective Well Being Under Neuroleptics Scale score  2, 4, 6, 8, 10, 12, 14, and 16 weeks | Mixed (3)  Industry | Good  Good |
| Forsberg, 2008[16](#_ENREF_16)  Europe  41 | Mean age: 41.0  Female N: 16  Male N: 25  Nonwhite: NR  Schizophrenia N: NR  Bipolar N: NR  Other N: NR | Multimodal lifestyle intervention of 70 group visits over 12 months, with activities including fitness exercises, practice buying and preparing food, learning to monitor heart rate, and activity scheduling. Participants received 50% subsidy on entrance and rental fees at sports centers. | Once weekly art class for 12 months. | BMI  Weight (kg)  HbA1c (%)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  Smoking cessation  Number of participants meeting criteria for Metabolic syndrome  13.5 months | Mixed (4)  Government, Private foundation | Fair  NA |
| Gillhoff, 2010[17](#_ENREF_17)  Europe  50 | Mean age: 48.0  Female N: 23  Male N: 27  Nonwhite: NR  Schizophrenia N: NR  Bipolar N: 50  Other N: NR | Multimodal lifestyle intervention including weekly fitness training, 7 psychotherapeutic/educational sessions, and 4 cooking and nutrition classes over the course of 5 months. | Wait list / Usual Care | BMI  Weight (kg)  HbA1c (%)  Total cholesterol (mmol/L)  LDL (mmol/L)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  5 months, 11 months | Efficacy (2)  Industry | Fair  NA |
| Graham, 2005[18](#_ENREF_18)  US  21 | Mean age: NR  Female N: 9  Male N: 12  Nonwhite: 5  Schizophrenia N: 18  Bipolar N: 3  Other N: 0 | Amantadine up to 300 mg/day (no further dosing details given) + 12 weekly sessions of healthy lifestyle education program and 3 month membership to gym or commercial weight loss program | Placebo + 12 sessions of healthy lifestyle education program and 3 month membership to gym or commercial weight loss program | BMI  Weight (lb)  1 month, 2 months, 3 months | Mixed (3)  Government, Industry | Poor  NA |
| Hoffmann, 2012[19](#_ENREF_19)  US, Europe, Asia, Middle East, Mexico  199 | Mean age: 38.5  Female N: 79  Male N: 120  Nonwhite: 112  Schizophrenia N: 199  Bipolar N: NR  Other N: NR | This was a 3-arm trial with 2 active arms.  Arm 1: Pretrial dose of olanzapine plus metformin 1000-1500 mg/day, followed by amantadine 200 mg/day if metformin was ineffective  Arm 2: Pretrial dose of olanzapine plus amantadine 200 mg/day, followed by metformin 1000-1500 mg/day if amantadine was ineffective | Pretrial dose of olanzapine only | BMI  Weight (kg)  HgA1c (%)  Total cholesterol (mmol/L)  LDL (mmol/L)  Discontinuation due to adverse event  Psychiatric Symptom Severity: BPRS  Psychiatric Symptom Severity: CGI  Psychiatric Symptom Severity: MADRS  22 weeks | Mixed (3)  Industry | Poor  Poor |
| Karagianis, 2009[20](#_ENREF_20)  US, Canada, Europe, Mexico  149 | Mean age: 39.0  Female N: 68  Male N: 81  Nonwhite: 71  Schizophrenia N: 106  Bipolar N: 41  Other N: 2 | Antipsychotic-switching:  FROM standard tablets of olanzapine 5-20 mg/day  TO orally disintegrating olanzapine 5-20 mg/day (mean dose 14.3 mg/day) | CONTINUE standard tablets of olanzapine 5-20 mg/day (mean dose 14.9 mg/day) | BMI  Weight (kg)  HbA1c (%)  Total cholesterol (mg/dl)  LDL (mg/dl)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  Discontinuation due to adverse event  HRQOL/Physical Function: Subjective Well Being Under Neuroleptics Scale score  2, 4, 6, 8, 10, 12, 14, and 16 weeks | Mixed (4)  Industry | Good  Good |
| Khazaal, 2007[21](#_ENREF_21)  Europe  61 | Mean age: 40.7  Female N: 33  Male N: 28  Nonwhite: NR  Schizophrenia N: 49  Bipolar N: 5  Other N: 7 | 12 weekly CBT-based manualized groups, provided by a master's-level psychologist, covering nutrition, diet, activity, exercise, and psychoeducation | One 2-hour nutrition education group | BMI  Weight (kg)  3 months, 6 months | Efficacy (1)  Not reported or unclear | Fair  NA |
| Kwon, 2006[22](#_ENREF_22)  Asia  48 | Mean age: 31.3  Female N: 33  Male N: 15  Nonwhite: NR  Schizophrenia N: 48  Bipolar N: 0  Other N: 0 | 8 session CBT weight management program focused on diet and exercise management, with a dietician and an exercise coordinator.  All participants continued their pretrial dose of olanzapine (5-20 mg/day). | Usual care  All participants continued their pretrial dose of olanzapine (5-20 mg/day). | BMI  Weight (kg)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  HRQOL/Physical Function: WHO-QOL-BREF, physical health subscore  4 weeks, 8 weeks, 12 weeks | Efficacy (1)  Industry | Fair  Poor |
| Littrell, 2003[23](#_ENREF_23)  US  70 | Mean age: 34.1  Female N: 27  Male N: 43  Nonwhite: 18  Schizophrenia N: 70  Bipolar N: 0  Other N: 0 | Olanzapine plus  16-session manualized education intervention administered by a master's-level clinician, focused on diet, nutrition, exercise, goal and activity setting, and self-monitoring. | Olanzapine only | BMI  Weight (lb)  4 months, 6 months | Mixed (3)  Industry | Good  NA |
| Mauri, 2008[24](#_ENREF_24)  Europe  49 | Mean age: 38.9  Female N: 28  Male N: 21  Nonwhite: NR  Schizophrenia N: 5  Bipolar N: 43  Other N: 1 | 5–7 psychoeducational groups on diet, exercise, nutrition, self-monitoring, and goal-setting.  All participants were continued on their pretrial dose of olanzapine. | Usual care  All participants were continued on their pretrial dose of olanzapine. | BMI  Weight (kg)  Total Cholesterol (mg/dl)  LDL (mg/dl)  Psychiatric Symptom Severity: GAF  Adverse Event: drug-related  3 months | Efficacy (1)  Industry | Poor  Poor |
| McDonnell, 2011[25](#_ENREF_25)  "26 countries worldwide" - no further details provided  1065 | Mean age: 38.9  Female N: 459  Male N: 856  The sex of the participants starting the trial was reported; the total participants starting n=1315, but this lead-in period was not randomized. By the point of the randomized part of the trial, there were 1065 individuals, but the breakdown for sex was not reported.  Nonwhite: 299  Schizophrenia N: 921  Bipolar N: NR  Other N: NR | Antipsychotic switching:  FROM oral tablets of olanzapine  TO long-acting injectable olanzapine 45 mg every 4 weeks | Continue oral tablets of olanzapine 10-20 mg/day (mean dose 14.3 mg/day) | BMI  Weight (kg)  Total Cholesterol (mg/dl)  LDL (mg/dl)  Discontinuation due to adverse event  Adverse event: "Treatment-emergent adverse event"  24 weeks | Efficacy (2)  Industry | Fair  Fair |
| McElroy, 2012[26](#_ENREF_26)  US  42 | Mean age: 33.7  Female N: 13  Male N: 29  Nonwhite: 9  Schizophrenia N: 1  Bipolar N: 42  Other N: NR | Zonisamide 100-600 mg/day (mean dose 380 mg/day)  All participants were registered to receive Personal Wellness Solution Counseling. All participants continued their pretrial dose of olanzapine. | Placebo  All participants were registered to receive Personal Wellness Solution Counseling. All participants continued their pretrial dose of olanzapine. | BMI  Weight (kg)  Total cholesterol (mg/dl)  LDL (mg/dl)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  Psychiatric Symptom Severity: CGI-S, bipolar version  1, 2, 3, 4, 6, 8, 10, 12, 14, and 16 weeks | Efficacy (2)  Industry | Good  Good |
| McKibbin, 2006[27](#_ENREF_27)  US  64 | Mean age: 54.0  Female N: 20  Male N: 37  Nonwhite: 22  Schizophrenia N: 57  Bipolar N: NR  Other N: NR  64 randomized, 52 completed and analyzed | Diabetes Awareness and Rehabilitation Training (DART):  90 minute, weekly, manualized sessions (up to 24 sessions, mean number of sessions 16.2), based on Social Cognitive Theory, addressing diabetes, nutrition, lifestyle, exercise, self-empowerment, self-monitoring, and incentives | Usual care plus 3 brochures from the American Diabetes Association on diabetes management | BMI  HbA1c (%)  LDL (mg/dl)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  6 months, 12 months | Efficacy (2)  Government | Fair  Fair |
| Narula, 2010[28](#_ENREF_28)  Asia  72 | Mean age: 31.1  Female N: 23  Male N: 44  Nonwhite: NR  Schizophrenia N: 67  Bipolar N: NR  Other N: NR  72 randomized, 67 completed and analyzed. | Olanzapine 5-20 mg/day +  topiramate 100 mg/day | Olanzapine 5-20 mg/day +  placebo | BMI  Weight (kg)  Total cholesterol (mg/dl)  LDL (mg/dl)  Systolic blood pressure (mm Hg)  Diastolic blood pressure (mm Hg)  Psychiatric Symptom Severity: PANSS  3 months | Efficacy (1)  Not reported or unclear | Fair  Fair |
| Newcomer, 2008[29](#_ENREF_29)  "Multinational"  173 | Mean age: 39.2  Female N: 62  Male N: 111  Nonwhite: 55  Schizophrenia N: 173  Bipolar N: NR  Other N: NR | Antipsychotic switching:  FROM olanzapine at 10-20 mg/day (mean 15.9 mg/day)  TO aripiprazole 15 mg/day (mean 16.0 mg/day) | CONTINUE olanzapine at 10-20 mg/day (mean 15.9 mg/day) | Weight (kg)  Total Cholesterol (mg/dl)  LDL (mg/dl)  Any Adverse Event  Psychiatric Symptom Severity: CGI-I  6 weeks, 8 weeks, 12 weeks, 14 weeks | Mixed (4)  Industry | Fair  Fair |
| Nickel, 2005[30](#_ENREF_30)  Europe  49 | Mean age: 34.9  Female N: 49  Male N: 0  Nonwhite: NR  Schizophrenia N: 20  Bipolar N: NR  Other N: NR | Topiramate 250 mg/day | Placebo | Weight (kg)  HRQOL/Physical Function: SF36-Physical Functioning  HRQOL/Physical Function: SF36-Role  10 weeks | Efficacy (1)  Not reported or unclear | Fair  Fair |
| Skrinar, 2005[31](#_ENREF_31)  US  30 | Mean age: 37.8  Female N: 20  Male N: 10  Nonwhite: NR  Schizophrenia N: NR  Bipolar N: NR  Other N: NR | 48 exercise sessions (4 per week) plus 12 health education sessions (1 per week), including healthy eating, weight management, adequate amounts of exercise, stress relief, spirituality and wellness, and individual planning to incorporate wellness activities.  Participants attended an average of 31 exercise sessions. | Usual care | BMI  Weight (kg)  Total cholesterol (mg/dl)  Psychiatric Symptom Severity: SCL-90, SF-36, QOL  3 months | Efficacy (2)  Industry | Fair  Fair |
| Stroup, 2011[32](#_ENREF_32)  US  215 | Mean age: 41.0  Female N: 78  Male N: 137  Nonwhite: 92  Schizophrenia N: 215  Bipolar N: NR  Other N: NR | Antipsychotic switching:  FROM olanzapine at 5-20 mg/day (mean 18.5 mg/day) OR  quetiapine at 200-1200 mg/day (mean 502 mg/day) OR  risperidone 1-16 mg/day (mean 4.1 mg/day)  TO aripiprazole 5-30 mg/day (mean 16.9 mg/day)  PLUS a manualized behavioral intervention occurring weekly for 4 weeks and monthly thereafter, including diet, exercise, and education on reducing risk of cardiovascular disease. | CONTINUE:  olanzapine 5-20 mg/day (mean 18.0 mg/day) OR  quetiapine 200-1200 mg/day (mean 572 mg/day) OR risperidone 1-16 mg/day (mean 4.1 mg/day).  Doses of medication could be adjusted during the trial, but medication could not be switched.  PLUS a manualized behavioral intervention occurring weekly for 4 weeks and monthly thereafter, including diet, exercise, and education on reducing risk of cardiovascular disease. | BMI  Weight (kg)  HbA1c (%)  Total cholesterol (mg/dl)  LDL (mg/dl)  Other CVD Summary Risk Score  Discontinuation due to adverse event  Adverse Event: Death  Adverse Event: Hospitalization  Adverse Event: Any serious adverse event  Psychiatric Symptom Severity: CGI  24 weeks | Mixed (5)  Government,  Industry | Good  Good |
| Wang, 2012[33](#_ENREF_33)  Asia  72 | Mean age: NR  Female N: 32  Male N: 34  Nonwhite: NR  Schizophrenia N: 66  Bipolar N: 0  Other N: 0 | Metformin  1000 mg/day (250 mg bid for first 3 days; 500 mg bid for remainder) | Placebo | Discontinuation due to adverse event  BMI  Weight (kg)  Fasting glucose  4 weeks, 8 weeks, 12 weeks | Efficacy (2)  Scientific Research Fund of Liaoning Science and Technology Agency, China | Fair  Fair |
| Wu, 2008[34](#_ENREF_34)  Asia  128 | Mean age: 26.3  Female N: 64  Male N: 64  Nonwhite: NR  Schizophrenia N: 128  Bipolar N: 0  Other N: 0 | This was a 4-arm trial with 3 active arms.  Arm 1: Metformin 750 mg/day  Arm 2: Manualized lifestyle intervention including sessions on diet, exercise, medication adherence, goal setting, and activity scheduling. Some sessions included family; some sessions were provided by an exercise physiologist or a dietician.  Arm 3: Metformin 750 mg/day and manualized lifestyle intervention | Usual care plus placebo | BMI  Weight (kg)  Discontinuation due to adverse event  Insulin level (µIU/mL)  Psychiatric Symptom Severity: PANSS  4 weeks, 8 weeks, 12 weeks | Mixed (5)  Government | Good  Good |
| Wu, 2012[35](#_ENREF_35)  Asia  84 | Mean age: NR  Female N: 84  Male N: 0  Nonwhite: 84  Schizophrenia N: 84  Bipolar N: 0  Other N: 0 | Metformin  1000 mg/day | Placebo | BMI  Weight (kg)  Discontinuation due to adverse event  Fasting blood glucose in mmol/L  1,2,3,4,5,6 months | Mixed (3)  Government | Good  Good |

aData for major outcomes are available from the authors upon request.

Abbreviations: BMI=body mass index; BPRS=Brief Psychiatric Rating Scale; CBT=cognitive behavioral training; CGI=clinical global impression; CVD=cardiovascular disease; GAF=global assessment of functioning; HAM-D=Hamilton Depression Rating Scale; HbA1c=glycosylated hemoglobin; HRQOL=health-related quality of life; LDL=low-density lipoprotein; MADRS=Montgomery-Asberg Depression Rating Scale; NA=not applicable; NR=not reported; PANSS=positive and negative syndrome scale; WHO-QOL-BREF=World Health Organization-Quality of Life (abbreviated)

**References Cited in Appendix F**

1. 1. Alvarez-Jimenez M, Gonzalez-Blanch C, Vazquez-Barquero JL, et al. Attenuation of antipsychotic-induced weight gain with early behavioral intervention in drug-naive first-episode psychosis patients: A randomized controlled trial. J Clin Psychiatry. 2006;67(8):1253-60. PMID: 16965204.

2. Assuncao SS, Ruschel SI, Rosa Lde C, et al. Weight gain management in patients with schizophrenia during treatment with olanzapine in association with nizatidine. Rev Bras Psiquiatr. 2006;28(4):270-6. PMID: 17242805.

3. Atmaca M, Kuloglu M, Tezcan E, et al. Nizatidine treatment and its relationship with leptin levels in patients with olanzapine-induced weight gain. Hum Psychopharmacol. 2003;18(6):457-61. PMID: 12923824.

4. Atmaca M, Kuloglu M, Tezcan E, et al. Nizatidine for the treatment of patients with quetiapine-induced weight gain. Hum Psychopharmacol. 2004;19(1):37-40. PMID: 14716710.

5. Ball MP, Warren KR, Feldman S, et al. Placebo-controlled trial of atomoxetine for weight reduction in people with schizophrenia treated with clozapine or olanzapine. Clin Schizophr Relat Psychoses. 2011;5(1):17-25. PMID: 21459735.

6. Borba CP, Fan X, Copeland PM, et al. Placebo-controlled pilot study of ramelteon for adiposity and lipids in patients with schizophrenia. J Clin Psychopharmacol. 2011;31(5):653-8. PMID: 21869685.

7. Brar JS, Ganguli R, Pandina G, et al. Effects of behavioral therapy on weight loss in overweight and obese patients with schizophrenia or schizoaffective disorder. J Clin Psychiatry. 2005;66(2):205-12. PMID: 15705006.

8. Brown C, Goetz J, Hamera E. Weight loss intervention for people with serious mental illness: a randomized controlled trial of the RENEW program. Psychiatr Serv. 2011;62(7):800-2. PMID: 21724796.

9. Bustillo JR, Lauriello J, Parker K, et al. Treatment of weight gain with fluoxetine in olanzapine-treated schizophrenic outpatients. Neuropsychopharmacology. 2003;28(3):527-9. PMID: 12629532.

10. Carrizo E, Fernandez V, Connell L, et al. Extended release metformin for metabolic control assistance during prolonged clozapine administration: a 14 week, double-blind, parallel group, placebo-controlled study. Schizophr Res. 2009;113(1):19-26. PMID: 19515536.

11. Cavazzoni P, Tanaka Y, Roychowdhury SM, et al. Nizatidine for prevention of weight gain with olanzapine: a double-blind placebo-controlled trial. Eur Neuropsychopharmacol. 2003;13(2):81-5. PMID: 12650950.

12. Deberdt W, Lipkovich I, Heinloth AN, et al. Double-blind, randomized trial comparing efficacy and safety of continuing olanzapine versus switching to quetiapine in overweight or obese patients with schizophrenia or schizoaffective disorder. Ther Clin Risk Manag. 2008;4(4):713-20. PMID: 19209252.

13. Elmslie JL, Porter RJ, Joyce PR, et al. Carnitine does not improve weight loss outcomes in valproate-treated bipolar patients consuming an energy-restricted, low-fat diet. Bipolar Disord. 2006;8(5 Pt 1):503-7. PMID: 17042889.

14. Evans S, Newton R, Higgins S. Nutritional intervention to prevent weight gain in patients commenced on olanzapine: a randomized controlled trial. Aust N Z J Psychiatry. 2005;39(6):479-86. PMID: 15943650.

15. Fleischhacker WW, Heikkinen ME, Olie JP, et al. Effects of adjunctive treatment with aripiprazole on body weight and clinical efficacy in schizophrenia patients treated with clozapine: a randomized, double-blind, placebo-controlled trial. Int J Neuropsychopharmacol. 2010;13(8):1115-25. PMID: 20459883.

16. Forsberg KA, Bjorkman T, Sandman PO, et al. Physical health--a cluster randomized controlled lifestyle intervention among persons with a psychiatric disability and their staff. Nord J Psychiatry. 2008;62(6):486-95. PMID: 18843564.

17. Gillhoff K, Gaab J, Emini L, et al. Effects of a multimodal lifestyle intervention on body mass index in patients with bipolar disorder: a randomized controlled trial. Prim Care Companion J Clin Psychiatry. 2010;12(5). PMID: 21274359.

18. Graham KA, Gu H, Lieberman JA, et al. Double-blind, placebo-controlled investigation of amantadine for weight loss in subjects who gained weight with olanzapine. Am J Psychiatry. 2005;162(9):1744-6. PMID: 16135638.

19. Hoffmann VP, Case M, Jacobson JG. Assessment of treatment algorithms including amantadine, metformin, and zonisamide for the prevention of weight gain with olanzapine: a randomized controlled open-label study. J Clin Psychiatry. 2012;73(2):216-23. PMID: 21672497.

20. Karagianis J, Grossman L, Landry J, et al. A randomized controlled trial of the effect of sublingual orally disintegrating olanzapine versus oral olanzapine on body mass index: the PLATYPUS Study. Schizophr Res. 2009;113(1):41-8. PMID: 19535229.

21. Khazaal Y, Fresard E, Rabia S, et al. Cognitive behavioural therapy for weight gain associated with antipsychotic drugs. Schizophr Res. 2007;91(1-3):169-77. PMID: 17306507.

22. Kwon JS, Choi JS, Bahk WM, et al. Weight management program for treatment-emergent weight gain in olanzapine-treated patients with schizophrenia or schizoaffective disorder: A 12-week randomized controlled clinical trial. J Clin Psychiatry. 2006;67(4):547-53. PMID: 16669719.

23. Littrell KH, Hilligoss NM, Kirshner CD, et al. The effects of an educational intervention on antipsychotic-induced weight gain. J Nurs Scholarsh. 2003;35(3):237-41. PMID: 14562491.

24. Mauri M, Simoncini M, Castrogiovanni S, et al. A psychoeducational program for weight loss in patients who have experienced weight gain during antipsychotic treatment with olanzapine. Pharmacopsychiatry. 2008;41(1):17-23. PMID: 18203047.

25. McDonnell DP, Kryzhanovskaya LA, Zhao F, et al. Comparison of metabolic changes in patients with schizophrenia during randomized treatment with intramuscular olanzapine long-acting injection versus oral olanzapine. Hum Psychopharmacol. 2011;26(6):422-433. PMID: 21823172.

26. McElroy SL, Winstanley E, Mori N, et al. A randomized, placebo-controlled study of zonisamide to prevent olanzapine-associated weight gain. J Clin Psychopharmacol. 2012;32(2):165-72. PMID: 22367654.

27. McKibbin CL, Patterson TL, Norman G, et al. A lifestyle intervention for older schizophrenia patients with diabetes mellitus: a randomized controlled trial. Schizophr Res. 2006;86(1-3):36-44. PMID: 16842977.

28. Narula PK, Rehan HS, Unni KE, et al. Topiramate for prevention of olanzapine associated weight gain and metabolic dysfunction in schizophrenia: a double-blind, placebo-controlled trial. Schizophr Res. 2010;118(1-3):218-23. PMID: 20207521.

29. Newcomer JW, Campos JA, Marcus RN, et al. A multicenter, randomized, double-blind study of the effects of aripiprazole in overweight subjects with schizophrenia or schizoaffective disorder switched from olanzapine. J Clin Psychiatry. 2008;69(7):1046-56. PMID: 18605811.

30. Nickel MK, Nickel C, Muehlbacher M, et al. Influence of topiramate on olanzapine-related adiposity in women: a random, double-blind, placebo-controlled study. J Clin Psychopharmacol. 2005;25(3):211-7. PMID: 15876898.

31. Skrinar GS, Huxley NA, Hutchinson DS, et al. The role of a fitness intervention on people with serious psychiatric disabilities. Psychiatr Rehabil J. 2005;29(2):122-7. PMID: 16268007.

32. Stroup TS, McEvoy JP, Ring KD, et al. A randomized trial examining the effectiveness of switching from olanzapine, quetiapine, or risperidone to aripiprazole to reduce metabolic risk: comparison of antipsychotics for metabolic problems (CAMP). Am J Psychiatry. 2011;168(9):947-56. PMID: 21768610.

33. Wang M, Tong JH, Zhu G, et al. Metformin for treatment of antipsychotic-induced weight gain: a randomized, placebo-controlled study. Schizophr Res. 2012;138(1):54-7. PMID: 22398127.

34. Wu RR, Zhao JP, Jin H, et al. Lifestyle intervention and metformin for treatment of antipsychotic-induced weight gain: a randomized controlled trial. JAMA. 2008;299(2):185-93. PMID: 18182600.

35. Wu RR, Jin H, Gao K, et al. Metformin for Treatment of Antipsychotic-Induced Amenorrhea and Weight Gain in Women With First-Episode Schizophrenia: A Double-Blind, Randomized, Placebo-Controlled Study. Am J Psychiatry. 2012. PMID: 22711171.