What Clinicians Need to Know about Metabolic Monitoring

Lauren Hanna, M.D. & Delbert Robinson, M.D.
The Zucker Hillside Hospital
Northwell Health

National Council for Behavioral Health
Montefiore Medical Center
Northwell Health
New York State Office of Mental Health
Netsmart Technologies
Objectives

• To understand the relationship between
  • Serious Mental Illness (SMI)
  • antipsychotic medication
  • metabolic & cardiovascular risk factors

• To understand the importance of
  • screening for modifiable risk factors for those on antipsychotics.

• To understand the guidelines for
  • metabolic monitoring among the SMI populations taking second generation antipsychotics (SGAs)
Schizophrenia Is A Deadly Disease

• Those with schizophrenia are > 3.5 times as likely to die compared with adults in the general population.

• On average, the years of potential life lost for each deceased individual were 28.5 years

These Deaths are Preventable.

• The increased morbidity and mortality is largely seen due to higher prevalence of **modifiable risk factors**.

• Specifically **metabolic** and **cardiovascular** co-morbidity are increasingly important.

• The prevalence of **diabetes and obesity** among individuals with **schizophrenia and affective disorders** is thought to be $\sim 1.5-2 \times$ higher than in the general population.
Those with Psychiatric Diagnoses Receive Inferior Quality of Care

REVIEW ARTICLE

Quality of medical care for people with and without comorbid mental illness and substance misuse: systematic review of comparative studies
Alex J. Mitchell, Darren Malone, Caroline Carney Doebbeling
The British Journal of Psychiatry May 2009, 194 (6) 491-499; DOI: 10.1192/bjp.bp.107.045732

• In a comparative review, more than 70% of studies found that patients with psychiatric diagnoses receive inferior quality of care in at least one medical area. (Mitchell et al. 2009)
You Can Save Lives!

• Signs of *medical illness* are often present early...
  ...but *medical care* is tragically often suboptimal.

• We can stop this premature death by
  • Prevention efforts
  • Monitoring for metabolic problems
  • Successful referral for treatment
Metabolic and Cardiovascular Risk Factors

• Hypertension
• Diabetes & Pre-diabetes
• Obesity & high waist circumference
• Cholesterol & Triglycerides
Signs of Medical Illness are Common and present Early

Figure 2. Prevalence of Smoking, Lipid Abnormalities, Hypertension, Diabetes, and Metabolic Syndrome and Respective Medication Treatment for the Conditions

N=394
Mean age = 23 years
Mean lifetime days of antipsychotic treatment = 47 days
Medical Illness is Common... 
...but Treatment is Not

Figure 2. Prevalence of Smoking, Lipid Abnormalities, Hypertension, Diabetes, and Metabolic Syndrome and Respective Medication Treatment for the Conditions

N=394
Mean age = 23 years
Mean lifetime days of antipsychotic treatment = 47 days
Metabolic Monitoring should occur more frequently for those on SGAs...

...but often it occurs less frequently
Guideline concordant monitoring of metabolic risk in people treated with antipsychotic medication: systematic review and meta-analysis of screening practices

A. J. Mitchell\textsuperscript{1,2*}, V. Delaffon\textsuperscript{1}, D. Vancampfort\textsuperscript{3,4}, C. U. Correll\textsuperscript{5,6} and M. De Hert\textsuperscript{3}

\textsuperscript{1} Psycho-oncology, Leicester General Hospital, Leicestershire Partnership Trust, Leicester, UK
\textsuperscript{2} Department of Cancer Studies and Molecular Medicine, Leicester Royal Infirmary, University of Leicester, UK
\textsuperscript{3} UPC KUL campus Kortenberg, Belgium
\textsuperscript{4} Department of Rehabilitation Sciences, Faculty of Kinesiology and Rehabilitation Sciences, Catholic University Leuven, Heverlee, Belgium
\textsuperscript{5} The Zucker Hillside Hospital, Glen Oaks, New York, USA
\textsuperscript{6} Albert Einstein College of Medicine, Bronx, New York, USA

Background. Despite increased cardiometabolic risk in individuals with mental illness taking antipsychotic medication, metabolic screening practices are often incomplete or inconsistent.
Many People Taking SGAs aren’t Screened for Preventable Risk Factors

• 39 studies involving 218,940 patients
• in the UK, Canada, Spain, the USA and Australia
• examined screening practices on routine clinical care
• all subgroups (not only psychotics spectrum).

**Monitoring Grades**

• <50% inadequate
• >= 50% suboptimal
• >=70% adequate
• >=80% good
• >=90% optimal
Many People Taking SGAs aren’t Screened for Preventable Risk Factors

<table>
<thead>
<tr>
<th>Metabolic Monitoring Parameter</th>
<th>Rate of Testing</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>47.9%</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>69.8%</td>
<td>Suboptimal</td>
</tr>
<tr>
<td>Glucose</td>
<td>44.3%</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Lipid</td>
<td>22.2%</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>41.5%</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>59.9%</td>
<td>Suboptimal</td>
</tr>
<tr>
<td>HbA1c</td>
<td>16.0%</td>
<td>Inadequate</td>
</tr>
</tbody>
</table>
Many People Taking SGAs aren’t Screened for Preventable Risk Factors

23.76% = The percentage of patients in NY State with diagnoses of Schizophrenia or Bipolar Disorder are prescribed antipsychotics...

.....but without Hemoglobin A$_{1c}$ or LDL-C measurements in the previous 12 months

29.83% = The percentage of patients in NY State with diagnoses of both Schizophrenia and diabetes......

......without Hemoglobin A$_{1c}$ measured in the previous 12 months.
If Metabolic Abnormalities Are So Prevalent, What Should We Do?

We have to follow monitoring guidelines for doing tests; AND,
We have to make sure that our patients get the tests.
SGAs Contribute to RISK FACTORS, BUT... 
...More metabolic monitoring is needed...
...not less SGA Use
Guidelines & Recommendations
Key Points...What We Can Do to Help

• Check It...If Abnormal

• Refer It (Psychiatrist & Internist)

• Check It More

• Change It (Education & Encouragement)
How should patients be monitored for the development of significant weight gain, dyslipidemia, and diabetes, and how should they be treated if diabetes develops?
If patients have abnormalities on testing, the frequency of testing is modified and individualized:

• To the abnormality in question

• Based on the severity of the abnormality

• Customization is determined by coordination with patient’s primary medical doctor, patient, and psychiatrist

• Customization can include healthy lifestyle strategies, medication strategies or a combination of these.
When to Do an Intervention

• There are varied professional guidelines and they sometimes differ on particular recommendations

• The important point is to...

CHOOSE ONE AND USE IT
Obesity, Diabetes, Hyperlipidemia

Reviews and Overviews

Physical Health Monitoring of Patients With Schizophrenia

Stephen R. Marder, M.D.
Susan M. Essock, Ph.D.
Alexander L. Miller, M.D.
Robert W. Buchanan, M.D.
Daniel E. Casey, M.D.
John M. Davis, M.D.
John M. Kane, M.D.
Jeffrey A. Lieberman, M.D.
Nina R. Schooler, Ph.D.
Nancy Covell, Ph.D.
Scott Stroup, M.D., M.P.H.
Ellen M. Weissman, M.D., M.P.H.

Objective: Schizophrenia is associated with several chronic physical illnesses and a shorter life expectancy, compared with life expectancy in the general population. One approach to improving the health of patients with schizophrenia is to improve the monitoring of physical health that occurs in psychiatric settings. The authors discuss a consensus panel's recommendations for improving the physical health monitoring of patients with schizophrenia who are treated in outpatient settings.

Method: A consensus meeting including psychiatric and other medical experts assembled on October 17–18, 2002, to evaluate the existing literature and to develop recommendations for physical health monitoring of patients with schizophrenia. Mass index, plasma glucose level, lipid profiles, and signs of prolactin elevation or sexual dysfunction. Information from monitoring should guide the selection of antipsychotic agents. Specific recommendations were made for cardiac monitoring of patients who receive medications associated with QT interval prolongation, including thioridazine, mesoridazine, and ziprasidone, and for monitoring for signs of myocarditis in patients treated with clozapine. Patients who receive both first- and second-generation antipsychotic medications should be examined for extrapyramidal symptoms and tardive dyskinesia. Patients with schizophrenia should receive regular visual examinations.
Hypertension

• Is not caused by antipsychotic medications

• But is a criteria for metabolic syndrome and contributes to the risk of heart attack and stroke. Can also be associated with renal disease.

• Even mildly elevated values over long term can contribute to increased health risks.

• Is often associated with being overweight/obese and sedentary lifestyle.
Key Points for Hypertension

• Check It (baseline)
  ...If abnormal (≥130/85)

• Check It More (at next visit...or every visit)

• Refer It (if 2 elevated values on separate visits → psychiatrist & internist)

• Change It
  Refer to a nutritionist and advise regular exercise
  Encouragement
  Internist or psychiatrist may medicate
Obesity

1. Monitor and document the BMI of every patient with schizophrenia, regardless of the antipsychotic medication prescribed.
   a. Weigh patients at every visit and track those weights
   b. Encourage patients to monitor and chart their own weight
   c. Measure and document waist circumference
   d. Patients should be weighed/measured at every visit for the first 6 months after medication initiation or change.
BMI is calculated based on weight and height

- **UNDERWEIGHT**: 16.0 - 18.4
- **NORMAL**: 18.5 – 24.9
- **OVERWEIGHT**: 25.0 – 29.9
- **OBESE CLASS 1**: 30.0 – 34.9
- **OBESE CLASS 2**: 35.0 – 39.9
- **OBESE CLASS 3**: ≥40.0
Obesity

2. The relative risk of weight gain for the different antipsychotic medications should be a consideration in drug selection for patients who have BMI ≥ 25.
Obesity

2. Unless a patient is underweight (BMI < 18.5), a weight gain of 1 BMI unit indicates a need for an intervention.

Waist circumference ≥ 35 inches for women or ≥ 40 inches for men also warrants intervention.
Obesity

4. Interventions may include:
   • closer monitoring of weight
   • engagement in a weight management program or seeing a nutritionist
   • use of an adjunctive treatment to reduce weight
   • or changes in a patient’s antipsychotic medication.
Effectiveness of Medications Used to Attenuate Antipsychotic-Related Weight Gain and Metabolic Abnormalities: A Systematic Review and Meta-Analysis

Lawrence Maayan¹,², Julia Vakhrusheva² and Christoph U Correll³,⁴,⁵

¹Child Study Center, New York University School of Medicine, New York, NY, USA; ²Nathan Kline Institute for Psychiatric Research, Orangeburg, NY, USA; ³The Zucker Hillside Hospital, Psychiatry Research, North Shore-Long Island Jewish Health System, Glen Oaks, NY, USA; ⁴Albert Einstein College of Medicine, Bronx, NY, USA; ⁵The Feinstein Institute for Medical Research, Manhasset, NY, USA

Antipsychotic-related weight gain and metabolic effects are a critical outcome for patients requiring these medications. A literature search using MEDLINE, Web of Science, PsychNET, and EMBASE for randomized, open and double-blind, placebo-controlled trials of medications targeting antipsychotic-induced weight gain was performed. Primary outcome measures were change and endpoint values in
Across 32 studies including 1482 subjects, 15 different medications were tested:

- amantadine
- dextroamphetamine
- d-fenfluramine
- famotidine
- fluoxetine
- fluvoxamine
- metformin
- nizatidine
- orlistat
- phenylpropanolamine
- reboxetine
- rosiglitazone
- sibutramine
- topiramate
- metformin + sibutramine.
Results:

• In all, 5 of 15 meds worked better than placebo.

• None entirely reversed weight gain.

• Metformin had the greatest weight loss
  • On average 6.5 pounds
  • But ranged from 2-10.7 pounds
Key Points for Weight (BMI, Abdominal Circumference)

• Check It (baseline, monthly first 3 months, then Q 3 months or every visit first 6 months after med change)
  ...If abnormal (overweight, abdominal obesity, or gaining weight)

• Refer it (psychiatrist & internist)

• Check it more (every visit, encourage patient to check weekly at home)

• Change it (refer to a nutritionist & encouragement, maybe metformin)
Diabetes

1. Mental health care providers should assess for risk factors for diabetes with all patients with schizophrenia

   • Risk factors include family history, BMI ≥ 25, waist circumference ≥ 35 inches for woman and ≥ 40 inches for men

Those who have significant risk factors for diabetes should have fasting glucose level or hemoglobin A₁c monitored 4 months after starting an antipsychotic and then yearly.

Patients who are gaining weight should have their fasting plasma glucose level or hemoglobin A₁c value monitored every 4 months.
Diabetes

Mental health care providers should **know the symptoms and signs of diabetes** and should **monitor patients at regular intervals**.

- **Weight change, polyuria, polydipsia**

Mental health care providers **should inform patients of the symptoms of diabetes** and **ask them to contact an internist** or primary health care provider if these symptoms occur.
Diabetes

Mental health care providers should ensure that patients with a diagnosis of diabetes are followed by a health care professional who is knowledgeable about diabetes.

The patient’s mental health care provider and primary health care provider should communicate when medication changes that may affect diabetes are made.
Diabetes

2. If a patient presents with symptoms of diabetes, check a random plasma glucose test.

If elevated, refer to an internist or primary health care provider.
Diabetes

Prediabetes
  • FG of 100mg/dl - 125mg/dl

Diabetes
  • FG ≥ 126 mg/dl
  • random plasma glucose >200mg/dl
  • hemoglobin A$_{1c}$ > 6.1%
Diabetes

If the patient calls with symptoms of diabetes, tell them to seek prompt evaluation by an internist or primary health care provider.
Key Points for Hyperglycemia

• Check it (baseline, at 3 or 4 months, then yearly)
...If abnormal (prediabetic or diabetic)
...Or if gaining weight

• Refer It (psychiatrist & internist)

• Check It More (Q 3-4 months)

• Change It
  Refer to a nutritionist
  Encouragement
  Internist or psychiatrist may medicate
Hyperlipidemia

1. Mental health care providers should be aware of the lipid profile of each patient with schizophrenia they treat.

Psychiatrists should follow one of the following guidelines for screening and treating patients who are at high risk for cardiovascular disease.

National Cholesterol Education Program
U.S. Preventive Services Task Force

https://www.uspreventiveservicestaskforce.org/
Hyperlipidemia

As part of routine care, if a lipid panel is not available for a patient with schizophrenia, one should be obtained and reviewed.

The lipid panel should include measurements of:
- total cholesterol
- low-density lipoprotein (LDL)
- High-density lipoprotein (HDL)
- triglycerides.
Hyperlipidemia

As a group, individuals with schizophrenia should be considered to be at high risk for coronary heart disease.

As a result, lipid screening should be carried out at least:

once every 2 years when the LDL level is normal

and

once every 6 months when the LDL level is greater than 130 mg/dl.
Hyperlipidemia

If LDL > 130 mg/dl, refer the patient to a primary care provider or an internist.

If a referral cannot be arranged, the mental health care provider should advise the patient on diet modification.

If the LDL level does not fall into the normal range, a cholesterol lowering drug should be initiated.
Diet and Cardiovascular Risk

• HDL (inverse relationship with TG)
• TG (inverse relationship with HDL)
• vLDL (carried triglycerides)
• LDL (carries cholesterol)
• Cholesterol
Hyperlipidemia

Mental health care providers should **identify patients who fulfill the criteria for the metabolic syndrome** and should ensure that they are being carefully monitored by a primary health care provider.
Key Points for Lipids

• Check It (baseline and Q 5 years? Maybe better Q 2 years)
...If Abnormal (LDL >130)

• Refer It (psychiatrist & internist)

• Check It More (Q 6 months)

• Change It (Refer to a nutritionist & encouragement, maybe statin)
Why is Metabolic Syndrome Important?

• Metabolic syndrome is a group of risk factors including hypertension, hyperglycemia, dyslipidemia, and abdominal fat.

• It doubles the risk of cardiovascular disease which can lead to heart attacks and strokes.

• It increases by 5 times the risk of diabetes.
What is Metabolic Syndrome?

At least 3 of the following 5 conditions:

- Fasting glucose ≥100 mg/dL
- Blood pressure ≥130/85 mm Hg
- Triglycerides ≥150 mg/dL
- HDL-C <40 mg/dL in men or <50 mg/dL in women
- Waist circumference ≥102 cm (40 in) in men or ≥88 cm (35 in) in women

National Heart, Lung, and Blood Institute (NHLBI) and the American Heart Association (AHA)
Hyperlipidemia

2. Mental health providers should ensure that National Cholesterol Education Program or U.S. Preventive Services Task Force guidelines are followed for patients with abnormal cholesterol (total, LDL, HDL) and triglyceride levels.

When patients with abnormal levels are identified, the patient should be referred to a primary health care provider.

Or, in the absence of such a provider, treatment may be implemented by the mental health care provider.
Summary

• People with Schizophrenia die decades earlier due to preventable medical illness.

• They have a higher prevalence of modifiable risk factors, specifically metabolic and cardiovascular co-morbidity. This is specifically true for those on antipsychotics.

• Signs of medical illness present early, but medical care is often suboptimal.

• For those on antipsychotics, more frequent metabolic monitoring is indicated, but they often have less access to care and lower quality care.
Key Points...What We Can Do to Help

• Check It......If Abnormal

• Refer It

• Check It More

• Change It (Education & Encouragement)
Key Points for Weight (BMI, Abdominal Circumference)

• Check It (baseline, monthly first 3 months, then Q 3 months or every visit first 6 months after med change)

......If Abnormal (overweight, or gaining weight)

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Thank you!

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