

Advancing the Treatment of People With Mental Illness: A Call to Action in the Management of Metabolic Issues

This ACADEMIC HIGHLIGHTS section of The Journal of Clinical Psychiatry presents a summary of the meeting "Advancing the Treatment of People With Mental Illness: A Call to Action in the Management of Metabolic Issues," held in Vienna, Austria, on September 29–30, 2004, convened by the World Federation for Mental Health, and supported by an unrestricted educational grant from Bristol-Myers Squibb Company and Otsuka Pharmaceutical Co., Ltd.

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The Burden of Metabolic Syndrome in Mental Illness

Metabolic syndrome is a multifactorial disease of considerable heterogeneity but is generally considered to encompass the clustering of obesity, hypertension, impaired glucose tolerance, and dyslipidemia. It is a major cause for concern in modern medicine and is a significant risk factor both for cardiovascular disease (CVD) and for overall mortality and morbidity.^{1,2} The incidence of metabolic syndrome increases with advancing age and increasing adiposity.

The prevalence of metabolic syndrome is rising in the general population and is associated with the growing prevalence of obesity that has been observed worldwide but particularly in Western society. Although estimates of prevalence are dependent on the exact definition used, it is generally accepted that more than 20% of adults in much of the industrialized world have metabolic syndrome.^{3,4} For example, studies have indicated that the prevalence of metabolic syndrome is around 20% to 30% among U.S. adults,^{5–7} 30% to 40% among urban Indians,^{8,9} 30% among Iranians,¹⁰ 20% among Greeks,¹¹ and 17% among Italians.¹² Metabolic syndrome has even been shown to be present in more than 15% of South Koreans despite a low prevalence of obesity in this population.¹³ However, obesity remains a major risk factor for metabolic syndrome, with 50% to 60% of obese (body mass index > 30 kg/m²) U.S. adults diagnosed with metabolic syndrome in a recent national survey.⁶

Metabolic syndrome may be more prevalent in people with mental illness (namely, for the purposes of this report,

schizophrenia, bipolar disorder, and unipolar disorder) compared with the general population.^{14–16} This may be a result of lifestyle impacts such as smoking, unhealthy diet, and low levels of exercise; may be due to the impact of the disease state on motivation and energy levels; may be an effect of medications used in the treatment of mental illness; or may be a consequence of genetic factors.^{14,17} Although the relative contribution of the various factors to increasing the risk of developing metabolic syndrome and CVD in this population is poorly understood, there is evidence to suggest that some psychotropic medications may play a significant role.^{14,18–20}

Mortality is also increased in people with mental illness. Although the suicide rate is higher in these individuals compared with the general population,²¹ evidence suggests that much of the excess mortality is due to CVD.^{17,22,23} This increased morbidity and mortality among people with mental illness are significant causes for concern both from an economic point of view and, more importantly, from the perspective of the impact that this increased morbidity and mortality has on persons with mental illness and their family and friends.

Recently, a number of consensus statements have been issued that provide guidance on the detection and treatment of metabolic syndrome and its components in people with mental illnesses (Table 1). While these consensus statements provide a sound basis for developing global standards for monitoring and treating metabolic

Table 1. Recently Published Consensus Statements on the Issues of Metabolic Disease and Mental Illness

Title	Authors/Sponsors	Publication Date	Reference
Physical health monitoring of patients with schizophrenia	Marder et al	2004	24
Consensus development conference on antipsychotic drugs and obesity and diabetes	American Diabetes Association, American Psychiatric Association, American Association of Clinical Endocrinologists, North American Association for the Study of Obesity	2004	19
Schizophrenia and diabetes 2003: expert consensus summary	Dinan	2004	25
Diabetes, psychotic disorders, and antipsychotic therapy: a consensus statement ^a	Lambert et al	2004	26

^aThis consists of 3 documents: the Consensus Statement, a companion document for Consumers and Carers, and a Guide for Consumers and Carers.

disorders in people with mental illness, they also contain, in some areas, divergent opinions. Furthermore, these consensus statements have tended to focus more on the nature of the monitoring required as opposed to the practicalities of how and where monitoring can most effectively occur.

In the light of these recent publications and the emergence of new clinical trial and research data, the World Federation for Mental Health believes that it is now appropriate to reexamine the question of monitoring and management of metabolic disorders in people with mental illness. This reexamination was carried out in the unique context of an integrated discussion across a broad group of multiple stakeholders with an international perspective. In addition to representatives from different clinical specialties, including psychiatrists, endocrinologists, and primary care physicians, the participants included patients/consumers, family members and caregivers, and citizen advocates. The aim of this review is to offer a broader geographical and cultural perspective and provide guidance for monitoring and management of metabolic syndrome in a real-world setting. In particular, this document represents a call-to-action and seeks to:

- Heighten overall awareness within the broad medical community of metabolic disorders in people with mental illness
- Encourage physicians—both psychiatrists and primary care physicians—to institute regular

monitoring of metabolic parameters when treating people with mental illness

- Define what needs to be monitored and how, where, and by whom monitoring should be done
- Define what should be done in response to results of monitoring
- Encourage definition of best practice in managing metabolic disorders in collaboration with the patient
- Encourage physicians to act to decrease the risk of metabolic syndrome in people with mental illness

- Encourage further research into causative factors, impacts of psychotropic medications, and development of further pharmaceutical alternatives that are not associated with metabolic consequences
- Inform and educate physicians about the importance of the collaborative nature of treating people with mental illness
- Inform and educate people with mental illness and their families/caregivers about metabolic issues—the symptoms, consequences, treatment, and management

Current Situation Analysis

What Is Metabolic Syndrome?

Metabolic syndrome is a multifactorial condition with a clustering of risk factors around insulin resistance, which, in turn, leads to a number of secondary effects, including atherogenic dyslipidemia and the development of pro-inflammatory and prothrombotic states.²⁷ The various components of metabolic syndrome have different origins that may have a genetic or environmental basis. Over the last few years, metabolic syndrome has become a focus of interest for physicians and scientists from a variety of disciplines, and, as a consequence, a number of different definitions have been proposed (Table 2).

What Are the Risks Associated With Metabolic Syndrome?

Individuals with metabolic syndrome are at an increased risk of developing diabetes and CVD, of suffering events such as myocardial infarction and stroke, and of overall mortality.³¹ The presence of even 1 metabolic syndrome criterion or 2 metabolic syndrome criteria increases the risk for mortality from CVD, with increasing number of metabolic syndrome criteria associated with increasing CVD risk.^{32,33} The relationship has been clearly demonstrated in patients with and without a prior history of CVD. For example, in a recent prospective cohort study in which 6255

Table 2. Definitions of Metabolic Syndrome

Factor	ATP III ²⁸	WHO ²⁹	EGIR ³⁰
	3 or more of the following risk factors:	Diabetes or impaired glucose tolerance or insulin resistance and 2 of the following:	Insulin resistance or hyperinsulinemia and 2 of the following:
Obesity			
BMI		> 30	
Waist circumference			
Male	> 102 cm (> 40 in)		> 94 cm (> 37 in)
Female	> 88 cm (> 35 in)	<i>and/or</i>	> 80 cm (> 31.5 in)
Waist-to-hip ratio			
Male		> 0.9	
Female		> 0.85	
Dyslipidemia			
Triglycerides	≥ 150 mg/dL (≥ 1.7 mmol/L)	> 1.7 mmol/L (> 150 mg/dL) <i>and/or</i>	> 2.0 mmol/L (> 176 mg/dL)
HDL cholesterol			
Male	< 40 mg/dL (< 1.0 mmol/L)	< 0.9 mmol/L (< 35 mg/dL)	< 1.0 mmol/L (< 40 mg/dL)
Female	< 50 mg/dL (< 1.2 mmol/L)	< 1.0 mmol/L (< 40 mg/dL)	< 1.0 mmol/L (< 40 mg/dL) <i>or</i> treated for dyslipidemia
Hypertension	≥ 130/85 mm Hg	≥ 140/90 mm Hg <i>and/or</i> treated for hypertension	> 140/90 mm Hg <i>and/or</i> treated for hypertension
Fasting glucose	≥ 110 mg/dL (≥ 6.1 mmol/L) revised to: ≥ 100 mg/dL (≥ 5.5 mmol/L)		≥ 6.1 mmol/L (≥ 110 mg/dL)
Urinary albumin		> 20 mg/min	
Albumin/creatinine		> 30 mg/g	

Abbreviations: ATP III = National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III), BMI = body mass index, EGIR = European Group for the Study of Insulin Resistance, HDL = high-density lipoprotein, WHO = World Health Organization.

U.S. male and female subjects aged 30 to 75 years enrolled in the Second National Health and Nutrition Examination Survey and were followed for a mean of 13.3 years, the presence of metabolic syndrome was shown to strongly predict CVD and total mortality.² Similarly, in a study population of 1045 patients recently diagnosed with coronary heart disease, stroke, peripheral arterial disease, or abdominal aortic aneurysm, the presence of metabolic syndrome was associated with advanced vascular damage as measured by carotid intima-media thickness (IMT), ankle brachial pressure index (ABPI), and the presence of albuminuria. An increase in the number of components of metabolic syndrome was associated with an increase in mean IMT, lower ABPI, and higher prevalence of albuminuria.³⁴

What Are the Currently Recommended Treatment Approaches to Reducing the Risk Conferred by Metabolic Syndrome?

Advice on the treatment of metabolic syndrome, both in the general population and in individuals with mental

illness, has been published by a number of interested groups.^{19,35,36} In general, lifestyle modification and pharmacotherapy, when deemed necessary, are the recommended approaches. For example, the American Heart Association/National Heart, Lung, and Blood Institute/American Diabetes Association³⁵ jointly recommend dietary modification (reduced consumption of saturated fats and simple sugars and increased intake of fruits, vegetables, and whole grain) and increased physical exercise, along with pharmacologic management of diabetes, hypertension, and dyslipidemia where required (Table 3).

Why Is Metabolic Syndrome an Issue of Particular Concern in People With Mental Illness?

People with mental illness have a reduced life expectancy compared with the general population,²¹ and CVD contributes significantly to this. People with mental illness often have increased risk for CVD because of a higher prevalence of obesity,^{37,38} smoking,³⁹ diabetes,^{14,40} hypertension, and

dyslipidemia^{41,42} in this population. People with mental illness may have lifestyle factors, often as a result of the social and emotional impact of their disorder, that contribute to the development of metabolic syndrome (Table 4).^{43,44}

People with mental illness may be prescribed psychotropic medications. Psychotropic medications appear to have differing weight-gain liabilities and differing risk of causing components of metabolic syndrome.^{14,18–20,45–48} In addition, psychotropic medications may change spontaneous activity levels due to the commonly occurring side effects of sedation and possible parkinsonism.⁴⁹ This would be predicted to decrease resting metabolic rates and caloric expenditure, although few studies have been done in proof of this principle.⁵⁰

What Are the Key Issues That Prevent Optimal Treatment of Metabolic Disorders in People With Mental Illness?

While recognition of metabolic syndrome and its relationship with mental

Table 3. Recommended Treatment Approaches for the Management of Metabolic Syndrome^a

Management of underlying causes

- Weight control program
- Program to encourage physical activity and physical wellness

Treatment of components

- Control of diabetes
- Control of hypertension
- Treatment of dyslipidemia (particularly to reduce elevated triglycerides and increase low HDL-cholesterol)

^aBased on Grundy et al.³⁵
Abbreviation: HDL = high-density lipoprotein.

Table 4. Factors That May Predispose People With Mental Illness to Develop Metabolic Syndrome^a

- Poor diet
- Lack of exercise
- Smoking
- Substance abuse
- Stress
- Medication that causes weight gain
- Inadequate self-care
- Adherence to prescribed medication
- Financial hardship
- Symptoms resulting in poor self-esteem and lack of motivation
- Limited availability and coordination of medical care

^aBased on McCreadie⁴³ and Kumar.⁴⁴

illness is increasing,⁵¹ there is still a lack of understanding in the medical community as a whole of the special needs of people with mental illness regarding monitoring and treatment.^{26,52-54} Furthermore, although psychiatrists are increasingly recognizing that weight gain is a troubling side effect of some antipsychotic treatments, often little is done to address it.⁵³⁻⁵⁵

Moreover, people with mental illness may experience variable standards of care; actual monitoring may be less than that claimed, physicians may have a poor understanding of how to monitor, and there may be poor detection of side effects by physicians.^{56,57} In addition, mental health centers and clinics are often not equipped and prepared to monitor physical health issues (e.g., physical examinations and weight, glucose and

blood pressure screenings). People with mental illness may also have physical, social, and economic barriers to seeking treatment and may require significant support before taking responsibility for their well-being.⁵⁷

Anecdotal reports indicate that patients are frequently not included in the decision-making process for choosing their treatments. Use of a communication checklist can significantly improve physician-patient communication. For example, use of a 20-point list of questions relating to common problems or areas of perceived need that might be experienced

by patients with severe mental illness resulted in improvement of patient-reported quality of patient-doctor communication and an increase in treatment change.⁵⁸ Similarly, when appropriate, families need to be involved by health care professionals in deciding treatment strategies.

There is a paucity of information available for people with mental illness and their family members, in terms of both the condition itself and its treatment. All of these factors have been shown to have the potential to contribute to nonadherence to psychotropic medication.⁵⁹

Recommendations for Metabolic Disorder Management in People With Mental Illness

What Are the Key Issues?

There are a number of key issues that relate to the overall management of metabolic disorders in individuals with mental illness. First, there is no scientifically (or politically) defensible argument to support the position that people with mental illness should not receive the same standard of care as others in the population without mental illness. Second, health care professionals need to be fully informed of the increased risk of metabolic disorders and need for intensive monitoring in people with mental illness. In particular, physicians should be encouraged, as far as possible, to act to avoid the development of metabolic disorders rather than treat the consequences. For example, there is ample evidence that the onset of type 2 diabetes in high-risk subjects with impaired glucose tolerance can be delayed and/or prevented through changes in lifestyle (dietary intervention, weight reduction, increased physical activity) or drug treatment.^{60,61} Finally, patient management should be performed in the context of fully informed patient consent and, when possible, patient participation in treatment planning and decision-making.

Who Should Manage Metabolic Monitoring and Treatment and Where Should It Occur?

The clinical setting where metabolic monitoring and management can feasibly be conducted will depend on a number of factors that may vary significantly from country to country and from urban to rural settings. Key concerns will involve the availability of time and personnel from different medical disciplines who might contribute to this process. In some settings, differences in who can be compensated for providing the monitoring and management service may be critical. The most appropriate setting might be that of the mental health care provider where the person with mental illness is seen most often, or it may be more realistic to expect services to occur at the level of the primary care practitioner (PCP). In many low-income and developing countries, access to psychiatrists and PCPs may often be limited. Thus, increased emphasis must also be placed on educating primary care nurses to recognize, treat, and manage metabolic issues in people with mental illness. Ideally, monitoring of physical health (physical examinations, weight monitoring, diabetes

screening, etc.) should be incorporated into community mental health services such as mental health centers and outpatient clinics. A recent study by Druss et al. (2001)⁶² demonstrated that on-site, integrated primary care was, indeed, associated with improved quality and outcomes of medical care.

However, many mental health clinics are poorly equipped (and possibly not attuned to the need) to monitor metabolic parameters, so thought should be given to the changes needed if monitoring is to occur in this setting. In addition, mental health clinics may find it difficult to monitor due to a lack of time and necessary resources such as staff that are trained in monitoring. Furthermore, psychiatrists are likely to lack familiarity with metabolic monitoring and may be unwilling to carry out physical measurements or take blood samples. PCPs have the advantage of overseeing the patient's complete health care program, having a long-term relationship with the person with mental illness and family,⁶³ identifying problems at an early stage, coordinating general and mental health services for the person with mental illness, and providing support for families⁶³ (and may be more accessible than psychiatrists in some settings^{63,64}). However, PCPs often have little specialized training in the diagnosis, treatment, or management of mental disorders.⁶⁴ In addition to this, people with mental illness in some countries may be seen more frequently in a mental health setting rather than in primary care.

The single most important factor is that there is a responsible physician supervising monitoring and metabolic management in people with mental illness. Given the recognized propensity of many psychotropic medications to cause metabolic effects such as weight gain, it is clearly the prescriber of the medication who must take responsibility for ensuring that the monitoring of the effects of the medications prescribed takes place at suitable intervals and on an ongoing basis.²² The psy-

Table 5. Parameters That Need to Be Monitored in Every Individual Receiving Treatment for Mental Illness

Family and personal history
Weight
• Body mass index (BMI)
• Waist circumference
Presence of diabetes/prediabetic conditions
• Blood glucose monitoring
• Symptoms of diabetes
Blood pressure
Lipid profiles

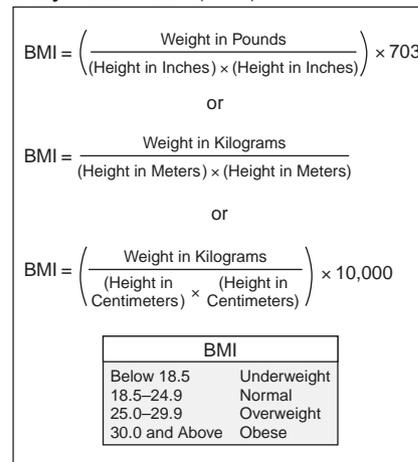
chiatrist is most likely to be the prescriber of psychiatric medications, although the PCP will sometimes have this function. Either way, actual monitoring may need to be delegated to the individual's PCP or to health care support staff such as nurses or other ancillary health care professionals. Wellness programs within clinics provide an ideal structure to support people with mental illness. Both the patient and, when appropriate, the family should be involved from the beginning in metabolic monitoring, in particular in monitoring weight. Importantly, people with mental illness should be well informed so that they are empowered to take control of their own monitoring.

What Needs to Be Monitored?

The presence of obesity or being overweight, blood pressure readings, blood glucose, and lipid profiles all need to be monitored on a regular basis (Table 5). The question of monitoring frequency has previously been reviewed, and reference is made to the recommendations in that publication.²⁴ Valuable information can also be gained from a close study of the patient's family and personal history.

Weight. Obesity or presence of being overweight is a key assessment, and time should be taken to do this accurately. The patient should be weighed, have height recorded, and have BMI calculated using the appropriate formula (Figure 1) or read from an appropriate chart. A number of Web sites, including the National Heart,

Figure 1. Formulas for Calculating Body Mass Index (BMI)



Lung, and Blood Institute site at <http://nhlbisupport.com/bmi/bmicalc.htm>, have automatic BMI calculators. Ideally, waist circumference should also be monitored as evidence suggests that it is the most accurate predictor of obesity-related health.⁶⁵ People with mental illness should be encouraged to self-monitor their weight on a regular basis and notify their physician of any changes of more than 5% of baseline body weight (this value should be calculated by the physician as a figure in pounds or kilograms, as appropriate, and communicated to the patient).

Diabetes/prediabetes. The presence of diabetes or prediabetic conditions should be assessed by monitoring blood glucose. A random blood glucose measurement is the easiest but least useful evaluation to make. A fasting blood glucose measurement provides more accurate information, although it will still not identify everyone with diabetes or impaired glucose tolerance. Ideally, patients should be asked to attend the clinic in a fasted state but, in reality, this is often impractical. An HbA1c measurement can be made if a fasting glucose is not feasible, with the understanding that this will fail to identify everyone with diabetes or impaired glucose tolerance.

Glucose tolerance tests provide the most accurate assessment of diabetes/glucose intolerance and are recom-

mended, but it is recognized that glucose tolerance tests on a regular basis may be impractical on the basis of local resource availability. Quantifying insulin resistance itself is the least practical monitoring procedure. Patients should be encouraged to self-monitor for symptoms of diabetes/ impaired glucose tolerance (polydipsia, polyuria, nocturia, unexplained weight loss, loss of energy, recurrent infections, blurred vision) and report their presence to their health care provider.

Blood pressure. Blood pressure should be assessed according to standard procedures.

Lipid profiles. Fasting low-density lipoprotein (LDL)-cholesterol, high-density lipoprotein (HDL)-cholesterol, and triglycerides should all be monitored according to current local guidelines.

What Should Be Done When Evidence of Metabolic Disorders Is Identified in People Being Treated for a Mental Illness?

First, patients should be informed of their condition and supported in making lifestyle changes to adopt a healthier diet and increase physical activity.

Second, patients with evidence of impaired glucose tolerance or diabetes should be referred for treatment to the appropriate specialist or their primary care practitioner depending on local practice for managing diabetic conditions. Likewise, patients with elevated blood pressure should receive appropriate antihypertensive medication and be referred to the appropriate specialist or primary care practitioner as necessary. Treatment of dyslipidemia is indicated in patients with elevated LDL-cholesterol for whom weight management and physical activity have not achieved LDL-cholesterol goal levels. The presence of metabolic syndrome is an indication for more aggressive lipid-lowering measures. Medications that raise HDL, nicotinic acid or fibrates, may be particularly

beneficial in patients with metabolic syndrome, but they have not been as widely studied as medications that lower LDL-cholesterol and therefore these latter medications remain the current focus of treatment strategies. There is some evidence that moderate exercise can improve a number of metabolic risk factors including dyslipidemia.⁶⁶

Finally, a review of the patient's medication should be conducted with the individual concerned, and consideration should be given to selecting the most appropriate therapy.

The most important considerations in the management of metabolic syndrome in individuals with mental illness are to try, as far as possible, to:

- ensure an early diagnosis of impaired glucose tolerance—before fully developed diabetes is present—and take appropriate remedial action
- prevent the occurrence of a first CV event

How Should Antipsychotic Medication Be Selected?

Selection of antipsychotic medication should be based on the patient's overall needs including efficacy requirements and the patient's risk factors; the balance of risk/benefit will differ from patient to patient. Simple treatment regimens should be used whenever possible to aid in compliance. Switching to a medication with a more appropriate risk/benefit profile is a consideration for patients in whom metabolic disorders are observed. The person with mental illness should be as fully involved as possible (and the family, if caregivers) in the decision on medication selection or switch. When switching medications, consideration should be given to all aspects of the individual's condition, the comparative risks and benefits of changing medications, and the individual's response to medication in managing the primary symptoms of the mental illness. In certain settings, cost and availability may also be a consideration. People with

mental illness should be provided with full information to enable them to be involved in the decisions concerning their medication.

How Can People With Mental Illness Be Supported in Making Lifestyle Changes?

Lifestyle changes are difficult to introduce, and health care professionals need to provide significant patient support in the form of the provision of information and referral to other health care professionals. Evidence suggests that achieving and maintaining weight loss is more likely to be successful when there is a physician-patient partnership in which the physician provides support and motivation for the patient's efforts to initiate and maintain a healthy body weight.⁶⁷ In cases in which a physician is not available to provide this support, partnership with a health educator can be as effective.

Prophylactic lifestyle intervention to avoid weight gain should be encouraged by providing nutritional support and advice that are simple and achievable and referral of patients to a nutritionist or dietician if available. Motivational interviewing may be helpful in supporting patients who are making lifestyle changes. There is evidence that structured educational intervention can have a positive effect on psychotropic medication-induced weight gain among people with schizophrenia.⁶⁸ People with mental illness should be referred for professional assistance in addressing issues relating to substances of abuse (smoking, alcohol, drugs). Again, there is evidence to support this approach.⁶⁹ In all cases, simple approaches should be used.

When families are involved in the treatment and management of the patient's illness, support and information should be provided to family members and other caregivers to encourage the integration of healthy diet and exercise into the individual's daily life. Ideally, the families should be participating in the healthy diet and exercise together with the patient.

(In addition, supervisors of group-living facilities for people with mental illness should become knowledgeable about these matters and incorporate them into meal planning and resident discussions.)

What Are the Practical Challenges?

Implementation of a coordinated metabolic monitoring and management program for people with mental illness will require a review of current practice and the introduction of new procedures, both of which will require time and effort on the part of the health care community. Involvement of people with mental illness in their treatment program will require the provision of information about their condition and medication and the development of approaches that empower, encourage, and support patients in their decisions on treatment and well-being.

If appropriate for the patient, the family can play a significant role in the treatment and monitoring of people with mental illness, and procedures need to be developed to involve them, at all stages of care. Interestingly, in a study of 404 people with schizophrenia in 5 European cities, while patient satisfaction differed significantly across the sites (highest in Copenhagen, lowest in London), at all sites patients reported that they were most dissatisfied with the inadequate involvement of relatives in the process of care and in the lack of provision of information about their illness.⁷⁰

Family involvement in treatment program planning is particularly important when they are acting as primary caregivers. However, family members cannot be expected to handle all aspects of care that may be required without accurate information and support services. Coordination, along with communication between psychiatrists, primary care practitioners, patients, and their families, and clarification of the roles of each are key steps to ensure that the special needs of people with mental illness regarding monitor-

ing and treatment for the components of metabolic syndrome are met. Tools to assist health care workers, patients, families, and caregivers in monitoring and reporting progress need to be developed and disseminated worldwide.

What Are the Areas for Future Research and Development?

Increased evaluation and assessment of the effectiveness of strategies to address lifestyle practices (exercise, health monitoring, nutrition, etc.) are urgently required, and more practical and applied research is required to develop best practices in providing patient support.

More scientific and clinical research is required to better understand the fun-

damental biochemical disorders underlying metabolic syndrome and to better understand the central nervous system and peripheral receptor biochemistry involved in the development of insulin resistance. Further research is also needed into the mechanisms underlying the side effects of psychotropic medications and into the development of effective pharmaceutical alternatives.

Public Policy and Advocacy Issues

Public policy should address the need for integration of physical and mental health care, with greater attention given to integrating physical health issues into mental health services systems.

Conclusions

- People with mental illness are at particular risk of developing the components of metabolic syndrome.
 - Prevention of metabolic disorders is key to ensuring the physical health of people with mental illness.
 - Regular and comprehensive metabolic monitoring, together with judicious selection of treatment programs, is necessary to ensure proper risk management.
 - Greater overall awareness of metabolic disorders in people with mental illness within the broad medical community is urgently needed.
 - Physicians need to act to decrease the risk of the development of metabolic syndrome in people with mental illness.
 - People with mental illness must receive a standard of care that is as good as that received by people with any other illness or disorder; poor physical health is a barrier to the recovery and
- reintegration of people with mental illness.
 - The standard supported by this call to action is one of careful and thorough diagnosis, informed treatment, regular monitoring, and educated involvement of patients and, when appropriate and possible, family members and/or caregivers.
 - Treatment of people with mental illness is a collaborative effort between the psychiatrist, other specialists such as cardiologists and endocrinologists, primary care physicians, the patient, and his or her family. Regular, comprehensive, and comprehensible communication is key to ensuring successful collaboration.
 - Clinicians should not underestimate a patient's ability to participate in making decisions about treatment and health matters, and should make every effort to assist people with mental illness to develop their own self-monitoring program and healthy lifestyle.

REFERENCES

- Ninomiya JK, L'Italien G, Criqui MH, et al. Association of the metabolic syndrome with history of myocardial infarction and stroke in the Third National Health and Nutrition Examination Survey. *Circulation* 2004;109:42–46
- Malik S, Wong ND, Franklin SS, et al. Impact of the metabolic syndrome on mortality from coronary heart disease, cardiovascular disease, and all causes in United States adults. *Circulation* 2004;110:1245–1250
- Kereiakes DJ, Willerson JT. Metabolic syndrome epidemic. *Circulation* 2003;108:1552–1553
- Scheen AJ, Luyckx FH. Metabolic syndrome: definitions and epidemiological data [in French]. *Rev Med Liege* 2003;58:479–484
- Ford ES, Giles WH, Mokdad AH. Increasing prevalence of the metabolic syndrome among US adults. *Diabetes Care* 2004;27:2444–2449
- Park YW, Zhu S, Palaniappan L, et al. The metabolic syndrome: prevalence and associated risk factor findings in the US population from the Third National Health and Nutrition Examination Survey, 1988–1994. *Arch Intern Med* 2003;163:427–436
- Haffner S, Taegtmeier H. Epidemic obesity and the metabolic syndrome. *Circulation* 2003;108:1541–1545
- Gupta R, Deedwania PC, Gupta A, et al. Prevalence of metabolic syndrome in an Indian urban population. *Int J Cardiol* 2004;97:257–261
- Ramachandran A, Snehalatha C, Satyavani K, et al. Metabolic syndrome in urban Asian Indian adults: a population study using modified ATP III criteria. *Diabetes Res Clin Pract* 2003;60:199–204
- Azizi F, Salehi P, Etemadi A, et al. Prevalence of metabolic syndrome in an urban population: Tehran Lipid and Glucose Study. *Diabetes Res Clin Pract* 2003;61:29–37
- Panagiotakos DB, Pitsavos C, Chrysohoou C, et al. Impact of lifestyle habits on the prevalence of the metabolic syndrome among Greek adults from the ATTICA study. *Am Heart J* 2004;147:106–112
- Bonora E, Kiechl S, Willeit J, et al. Metabolic syndrome: epidemiology and more extensive phenotypic description. Cross-sectional data from the Bruneck Study. *Int J Obes Relat Metab Disord* 2003;27:1283–1289
- Park HS, Oh SW, Cho SI, et al. The metabolic syndrome and associated lifestyle factors among South Korean adults. *Int J Epidemiol* 2004;33:328–336
- Holt RI, Peveler RC, Byrne CD. Schizophrenia, the metabolic syndrome and diabetes. *Diabet Med* 2004;21:515–523
- Ryan MC, Thakore JH. Physical consequences of schizophrenia and its treatment: the metabolic syndrome. *Life Sci* 2002;71:239–257
- Thakore JH. Metabolic disturbance in first-episode schizophrenia. *Br J Psychiatry Suppl* 2004;47:S76–S79
- Casey DE, Haupt DW, Newcomer JW, et al. Antipsychotic-induced weight gain and metabolic abnormalities: implications for increased mortality in patients with schizophrenia. *J Clin Psychiatry* 2004;65(suppl 7):4–18
- Almérás N, Després J-P, Villeneuve J, et al. Development of an atherogenic metabolic risk factor profile associated with the use of atypical antipsychotics. *J Clin Psychiatry* 2004;65:557–564
- Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes. *J Clin Psychiatry* 2004;65:267–272
- Newcomer JW. Atypical antipsychotics and metabolic effects: a comprehensive literature review. *CNS Drugs* 2005;19(suppl 1):1–93
- Siris SG. Suicide and schizophrenia. *J Psychopharmacol* 2001;15:127–135
- Meyer JM. Treating the mind and body in schizophrenia: risks and prevention. *CNS Spectr* 2004;9(10 suppl 11):25–33
- Osby U, Brandt L, Correia N, et al. Excess mortality in bipolar and unipolar disorder in Sweden. *Arch Gen Psychiatry* 2001;58:844–850
- Marder SR, Essock SM, Miller AL, et al. Physical health monitoring of patients with schizophrenia. *Am J Psychiatry* 2004;161:1334–1349
- Dinan TG. Schizophrenia and diabetes 2003: expert consensus meeting. *Br J Psychiatry Suppl* 2004;47:S53–S54
- Lambert TJ, Chapman LH, on behalf of the Consensus Working Group. Diabetes, psychotic disorders and antipsychotic therapy: a consensus statement. *Med J Aust* 2004;181:544–548
- Grundy SM, Brewer HB Jr, Cleeman JI, et al. Definition of metabolic syndrome: report of the National Heart, Lung, and Blood Institute/American Heart Association Conference on scientific issues related to definition. *Circulation* 2004;109:433–438
- Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *JAMA* 2001;285:2486–2497
- World Health Organization. Definition, diagnosis and classification of diabetes mellitus and its complications: report of a WHO consultation. Geneva, WHO; 1999
- Balkau B, Charles MA, Drivsholm T, et al. Frequency of the WHO metabolic syndrome in European cohorts, and an alternative definition of an insulin resistance syndrome. *Diabetes Metab* 2002;28:364–376
- Isomaa B. A major health hazard: the metabolic syndrome. *Life Sci* 2003;73:2395–2411
- Sattar N, Gaw A, Scherbakova O, et al. Metabolic syndrome with and without c-reactive protein as a predictor of coronary heart disease and diabetes in the West of Scotland Coronary Prevention Study. *Circulation* 2003;108:414–419
- Ridker PM, Buring JE, Cook NR, et al. C-reactive protein, the metabolic syndrome, and risk of incident cardiovascular events: an 8-year follow-up of 14719 initially healthy American women. *Circulation* 2003;107:391–397
- Olijhoek JK, van der Graaf Y, Banga JD, et al. The metabolic syndrome is associated with advanced vascular damage in patients with coronary heart disease, stroke, peripheral arterial disease or abdominal aortic aneurysm. *Eur Heart J* 2004;25:342–348
- Grundy SM, Hansen B, Smith SC Jr, et al. Clinical management of metabolic syndrome: report of the American Heart Association/National Heart, Lung, and Blood Institute/American Diabetes Association Conference on scientific issues related to management. *Circulation* 2004;109:551–556
- De Backer G, Ambrosioni E, Borch-Johnsen K, et al. European guidelines on cardiovascular disease prevention in clinical practice. Third Joint Task Force of European and Other Societies on Cardiovascular Disease Prevention in Clinical Practice. *Eur Heart J* 2003;24:1601–1610
- Allison DB, Fontaine KR, Heo M, et al. The distribution of body mass index among individuals with and without schizophrenia. *J Clin Psychiatry* 1999;60:215–220
- Thakore JH, Mann JN, Vlahos I, et al. Increased visceral fat distribution in drug-naive and drug-free patients with schizophrenia. *Int J Obes Relat Metab Disord* 2002;26:137–141
- Brown S, Inskip H, Barraclough B. Causes of the excess mortality of schizophrenia. *Br J Psychiatry* 2000;177:212–217
- Bushe C, Holt R. Prevalence of diabetes and impaired glucose tolerance in patients with schizophrenia. *Br J Psychiatry Suppl* 2004;47:S67–S71
- Wirshing DA, Boyd JA, Meng LR, et al. The effects of novel antipsychotics on glucose and lipid levels. *J Clin Psychiatry* 2002;63:856–865
- Meyer JM, Koro CE. The effects of antipsychotic therapy on serum lipids: a comprehensive review. *Schizophr Res* 2004;70:1–17
- McCreadie RG, on behalf of the Scottish Schizophrenia Lifestyle Group. Diet, smoking and cardiovascular risk in people with schizophrenia: descriptive study. *Br J Psychiatry* 2003;183:534–539
- Kumar CT. Physical illness and schizophrenia [letter]. *Br J Psychiatry* 2004;184:541
- Allison DB, Mentore JL, Heo M, et al. Antipsychotic-induced weight gain: a comprehensive research synthesis. *Am J Psychiatry* 1999;156:1686–1696
- Fontaine KR, Heo M, Harrigan EP, et al. Estimating the consequences of antipsychotic induced weight gain on health and mortality rate. *Psychiatry Res* 2001;101:277–288
- Toalson P, Ahmed S, Hardy T, et al. The metabolic syndrome in patients with severe mental illnesses. *Prim Care Companion J Clin Psychiatry* 2004;6:152–158
- Kasper S, Hale A, Azorin JM, et al. Benefit-risk evaluation of olanzapine, risperidone and sertindole in the treatment of schizophrenia. *Eur Arch Psychiatry Clin Neurosci* 1999;249(suppl 2):III–III14
- Clozaril [package insert]. East Hanover, NJ: Novartis Pharmaceuticals Corporation; 2002
- Procyshyn RM, Chau A, Tse G. Clozapine's effects on body weight

- and resting metabolic rate: a case series. *Schizophr Res* 2004;66:159–162
51. Newcomer JW, Nasrallah HA, Loebel AD. The atypical antipsychotic therapy and metabolic issues national survey: practice patterns and knowledge of psychiatrists. *J Clin Psychopharmacol* 2004;24 (5 suppl 1):S1–S6
 52. Wylie G, Hungin AP, Neely J. Impaired glucose tolerance: qualitative and quantitative study of general practitioners' knowledge and perceptions. *BMJ* 2002;324:1190
 53. Boilson M, Hamilton RJ. A survey of monitoring of weight and blood glucose in in-patients. *Psychiatr Bull* 2003;27:424–426
 54. Nasrallah HA, Newcomer JW. Atypical antipsychotics and metabolic dysregulation: evaluating the risk/benefit equation and improving the standard of care. *J Clin Psychopharmacol* 2004;24(5 suppl 1):S7–S14
 55. Groom G, Hickie I, Davenport T. Out of hospital, out of mind: a report detailing mental health services in Australia in 2002 and community priorities for national mental health policy for 2003–2008. Canberra, Australia: Mental Health Council of Australia; 2003:1–80
 56. Koran LM, Sox HC Jr, Marton KI, et al. Medical evaluation of psychiatric patients, 1: results in a state mental health system. *Arch Gen Psychiatry* 1989;46:733–740
 57. Phelan M, Stradins L, Morrison S. Physical health of people with severe mental illness [editorial]. *BMJ* 2001;322:443–444
 58. Van Os J, Altamura AC, Bobes J, et al. Evaluation of the two-way communication checklist as a clinical intervention: results of a multinational, randomised controlled trial. *Br J Psychiatry* 2004;184:79–83
 59. DiMatteo MR. Social support and patient adherence to medical treatment: a meta-analysis. *Health Psychol* 2004;23:207–218
 60. Laville M. Is it possible to prevent type 2 diabetes? [in French] *Ann Endocrinol (Paris)* 2003;64:S37–44
 61. Knowler WC, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002;346:393–403
 62. Druss BG, Rohrbaugh RM, Levinson CM, et al. Integrated medical care for patients with serious psychiatric illness: a randomized trial. *Arch Gen Psychiatry* 2001;58:861–868
 63. Kates N, Craven M, Bishop J, et al. Shared mental health care in Canada. *Can J Psychiatry* 1997;42 (suppl 12 pp)
 64. Department of Health and Human Services (DHHS). Report of a Surgeon General's working meeting on the integration of mental health services and primary health care. Nov 30–Dec 1, 2000; Atlanta, Ga. Rockville, Md: US DHHS, Public Health Service, Office of the Surgeon General; 2001
 65. Janssen I, Katzmarzyk PT, Ross R. Waist circumference and not body mass index explains obesity-related health risk. *Am J Clin Nutr* 2004;79:379–384
 66. Carroll S, Dudfield M. What is the relationship between exercise and metabolic abnormalities? a review of the metabolic syndrome. *Sports Med* 2004;34:371–418
 67. Hill JO, Wyatt H. Outpatient management of obesity: a primary care perspective. *Obes Res* 2002;10(suppl 2):124S–130S
 68. Littrell KH, Hilligoss NM, Kirshner CD, et al. The effects of an educational intervention on antipsychotic-induced weight gain. *J Nurs Scholarsh* 2003;35:237–241
 69. Steinberg ML, Ziedonis DM, Krejci JA, et al. Motivational interviewing with personalized feedback: a brief intervention for motivating smokers with schizophrenia to seek treatment for tobacco dependence. *J Consult Clin Psychol* 2004;72:723–728
 70. Ruggeri M, Lasalvia A, Bisoffi G, et al. Satisfaction with mental health services among people with schizophrenia in five European sites: results from the EPSILON study. *Schizophr Bull* 2003;29:229–245
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- Observers at the meeting were **Professor Karl Dantendorfer,** Representative from Mental Health Europe, Medical University of Vienna, Austria; **Dr. Shekhar Saxena,** Coordinator, Mental Health: Evidence and Research for the World Health Organization (WHO), Geneva, Switzerland; **Preston Garrison,** Secretary General and Chief Executive Officer, World Federation for Mental Health, Alexandria, Va., USA; **Richard Studer,** Board Member, World Federation for Mental Health, Alexandria, Va., USA; and **John S. Shelton, Ph.D.,** President, Physicians Postgraduate Press, Memphis, Tenn., USA.
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