Monitoring for Antipsychotic Metabolic Effects in an Inpatient Setting

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I practice at San Antonio State Hospital, a 301-bed facility for the seriously mentally ill in South Central Texas. About one out of three to one out of four of our patients have metabolic syndrome. Almost half have at least one component of metabolic syndrome. While I am describing my own inpatient practice's monitoring, most, if not all, of these suggestions would directly translate into other practice settings where antipsychotic medications are used. I would encourage any CPNP members with comments about metabolic monitoring to send an email to the CPNP list for discussion.

Metabolic effects of the antipsychotics include two sets of changes: those associated with Metabolic Syndrome (Table 1) and prolactin.

Table 1: Clinical Identification of the Metabolic Syndrome

Risk Factor	Defining Level	
	Men	Women
Abdominal Obesity (Waist Circumference)	>102 cm (>40 in)	>88 cm (>35 in)
Triglycerides	≥150 mg/dL	
HDL cholesterol	<40 mg/dL	<50 mg/dL
Blood pressure	≥130/85 mmHg	
Fasting glucose	≥110 mg/dL	

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The standard of practice for monitoring metabolic effects was published following a meeting of experts at Mount Sinai Hospital in New York in 2004 (Table 2). These recommendations are embodied in the Texas Department of State Health Services Mental Health Formulary Audit Criteria.

I have modified these criteria for my own use based upon some additional information. The main change was to monitor fasting lipid panel annually instead of every five years. That recommendation was directly from the ATP III guideline cited in Table 1. However, I believe that having schizophrenia and treatment with an antipsychotic represents a risk-factor that should be considered and therefore in compliance with ATP III, I monitor lipids annually. Other changes are to obtain vital signs for monitoring waist circumference and blood pressure quarterly instead of annually. I believe that these vital sign changes in monitoring frequency are desirable for three reasons: (1) earlier detection of problems; (2) ease of distinguishing a problematic trend from random changes with more data; and (3) reminders to patients of the need to keep track of their diet. Finally, I use the same criteria for all antipsychotics, not just the second generation agents. The first generation agents are also responsible for adverse metabolic effects; however, this was poorly recognized due to the high frequency of movement disorders.

A summary of the commonly reported adverse reactions (≥5% for any dose, and twice placebo rate) is shown in Table 3. The only metabolic effect in the entire table is weight gain. One clinical pearl I would like to share based on my clinical experience is that, I will not routinely continue an antipsychotic if the patient has gained five pounds (2.3 kg) in the first month of treatment. Patients that gain weight rapidly upon starting an antipsychotic frequently gain much more over time. However, if the patient experiences dramatic response, or there are other considerations unique to that individual, I will continue the offending antipsychotic and work to reduce the weight gain.

Currently, I monitor the metabolic and other effects of medications by reviewing patients' laboratory studies and vital signs. To be honest, waist circumference is almost never documented. However, for our inpatients we obtain vital signs weekly as a routine, so that is much easier to track.

This works fine for the 40 or so patients on my unit. However, we do not have sufficient staff to cover every unit. Therefore, I would like to have our electronic medical

record (EMR) system generate reports that could, at a minimum, show which patients are due for laboratory studies. While the only labs needed for metabolic monitoring are fasting plasma glucose and lipid panel, I will get a more comprehensive set of laboratory studies as clinically indicated. As an aside, I will ***not*** obtain a prolactin without clinical indication. This will almost always result in a false-positive elevated prolactin concentration and requires a workup for a pituitary microadenoma. I have no concern about getting a baseline prolactin, if I ever saw a patient before they received their first antipsychotic dose, or when there are clinical symptoms that could be due to elevated prolactin.

I would eventually like to develop a system that would obtain most objective data from the EMR and consider the date of the last datum needed and compare to the monitoring interval. If labs have been obtained recently for some other reason, they do not need to be repeated. Avoiding excessive blood draws for labs is a clinically important goal. I would like the report to be presented on-line and allow orders to be written and documentation to be generated with just a "click" per parameter. In addition, graphs of each parameter versus time should be available to identify trends that have not yet reached the limits of normal.

Merely keeping track of metabolic effects is not sufficient, rather, changes need to be made to prevent worsening of the clinical situation, reverse problems where possible, and proactively work with the rest of the treatment team to limit adverse effects.

Table 2: Monitoring Protocol for Patients on Antipsychotics

Parameter Monitored	Initiation				Ongoing	
	Baseline	4 Weeks	8 Weeks	12 Weeks	Quarterly	Annually
Personal / Family History	X					X
Weight & BMI	X	X	X	X	X	
Waist Circumference	X			X	x	
Blood Pressure	X			X	x	
Fasting Plasma Glucose	X			X		X
Fasting Lipid Profile	X			X		x

"X" indicates standard recommendation from reference;
"x" indicates modification by author
Adapted from American Diabetes Association, American Psychiatric Association, American Association of Clinical Endocrinologists, North American Association for the Study of Obesity. Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes. Diabetes Care. 2004;27(2):2004.
http://care.diabetesjournals.org/content/27/2/596.full.pdf

Table 3: Common Adverse Effects of Second Generation Antipsychotics

ADR	Aripiprazole	Asenapine	Clozapine*	Iloperidone	Lurasidone	Olanzapine	Quetiapine	Paliperidone	Risperidone	Ziprasidone
Agitation					X					
Akathisia	X	X			X	X		X	X	
Constipation			X			X				
Dizziness (a)			X	X		X	X		X	
Dry Mouth			X	X			X			
Dyspepsia							X			
Dystonia									X	
Fever			X							
Nasal Congestion				X						
Nausea			X		X				X	
Headache			X							
Oral Hypoesthesia		X								
Orthostatic Hypotension (b)			X	X		X				
Extrapyramidal Symptoms (c)					X			X	X	
Personality Disorder (d)						X				
Respiratory Tract Infection										X
Salivation			X							
Somnolence (e)		X	X	X	X		X		X	X
Sweating			X							
Syncope			X							
Tachycardia			X	X				X		
Tremor			X							
Visual Disturbances			X							
Weight Increased (f)				X		X				

(a) Includes vertigo
(b) Includes postural hypotension
(c) Includes parkinsonism
(d) Personality disorder is the COSTART term for designating nonaggressive objectionable behavior
(e) Includes fatigue, drowsiness, and sedation
(f) Includes weight gain
* Clozapine doesn't have placebo ADR rates, so this column only represents clozapine without regard to twice placebo rate
Data from current product labels

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