

# Tool for Monitoring Antipsychotic Side Effects (TMAS) ©



Assessment Date (dd/mm/yy)				
Assessment Completed By				

## A. HEALTH STATUS/CONCERNS

### ARE YOU CURRENTLY HAVING ANY OF THE FOLLOWING HEALTH CONCERNS?

**GENERAL** - Circle any areas of concern for further discussion with your care team

Energy	Motivation and emotional blunting	Increased appetite	Decreased appetite	Memory/attention/concentration
Swelling	Sleep increased/decreased			

**SKIN** - Circle any areas of concern for further discussion with your care team

Skin changes	Rashes	Easy bruising or bleeding		
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**HEAD & NECK** - Circle any areas of concern for further discussion with your care team

Headache	Blurred vision	Dizziness	Nasal congestion	Teeth
Swallowing	Speaking	Dry mouth	Increased saliva	

**BREAST/HORMONAL** - Circle any areas of concern for further discussion with your care team

Lumps	Pain or tenderness	Discharge	Menstrual changes	
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**HEART/LUNGS** - Circle any areas of concern for further discussion with your care team

Palpitations (racing or irregular heartbeat)	Chest Pain	Breathing		
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**DIGESTIVE SYSTEM** - Circle any areas of concern for further discussion with your care team

Increased salivation	Indigestion	Nausea	Vomiting	Heartburn
Diarrhea	Constipation			

**GENITO-URINARY** - Circle any areas of concern for further discussion with your care team

Sexual functioning	Interest in sex (increased/decreased)	Physical arousal	Orgasm	Ejaculation (as applicable)
Urinary functioning	Urge to pee	Peeing more frequently	Wetting bed at night	Difficulty peeing

**PLEASE NOTE ANY OTHER HEALTH CONCERNS NOT ADDRESSED ABOVE**

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## B. MOTOR SIDE EFFECTS

<b>Assessment Date (dd/mm/yy)</b>						
<b>Assessment Completed By</b>						
<b>Current Medication(s)</b>						
<b>SCORING:</b> When uncertain about severity (e.g. mild v. moderate), record the higher score	<b>Score</b>	<b>Score</b>	<b>Score</b>	<b>Score</b>	<b>Score</b>	<b>Score</b>
<b>SUBJECTIVE EXPERIENCE (≤ 1 week)</b>						
SCORE: 0 = NONE, 1 = QUESTIONABLE, 2 = MILD, 3 = MODERATE, 4 = SEVERE						
Parkinsonism						
Dyskinesia						
Akathisia						
Dystonia						
<b>PARKINSONISM – Facial Expression</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE: unclear if symptom present, 2 = MILD: mild decrease in facial expressiveness, 3 = MODERATE: consistently blunted affect, but some expressiveness with engagement, frequent staring gaze, reduced blinking, 4 = SEVERE: no facial expressiveness, staring gaze, notably reduced blinking						
Facial expression – reduced						
<b>PARKINSONISM – Tremor/Bradykinesia</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE: unclear if symptom present, 2 = MILD: infrequently present and/or small/fine amplitude movements, 3 = MODERATE: frequently present with moderate amplitude movements, 4 = SEVERE: continuously present with moderate to large amplitude movements						
Hands – tremor (resting)	R	R	R	R	R	R
	L	L	L	L	L	L
Hands – tremor (arms extended, fingers apart)	R	R	R	R	R	R
	L	L	L	L	L	L
Hands – bradykinesia	R	R	R	R	R	R
	L	L	L	L	L	L
<b>PARKINSONISM – Rigidity</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE: unclear if symptom present, 2 = MILD: some resistance to passive movement, 3 = MODERATE: moderate resistance to passive movement but easily able to move limb, 4 = SEVERE: marked resistance to passive movement, difficult to move limb						
Elbow – rigidity	R	R	R	R	R	R
	L	L	L	L	L	L
<b>PARKINSONISM – Gait</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE: unclear if symptom present, 2 = MILD: mild reduced pendular arm movement, normal step length, 3 = MODERATE: moderately reduced pendular arm movement, stiff posture, reduced step length, 4 = SEVERE: no pendular arm movement, markedly reduced step length/shuffling gait, difficulties turning, stooped posture						
Gait – abnormality						
<b>AKATHISIA</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE: unclear if symptom present, 2 = MILD: restless movements of one extremity, some increase in position changes but able to remain seated through duration of encounter, 3 = MODERATE: frequent movement of one or more extremity, very frequent position changes, may be asking to get up and walk, but able to remain seated through duration of encounter, 4 = SEVERE: near constant movement of more than one extremity, truncal rocking. Unable to remain seated for the duration of the encounter						
Observed motor restlessness						
<b>DYSTONIA</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE - unclear if symptom present, 2 = MILD: visible muscle contraction which patient can correct with minimal impact on posture. Patient does not appear distressed, 3 = MODERATE: notable and sustained muscle contraction which patient can correct, but must do so repeatedly, with impact on posture. Patient somewhat distressed, 4 = SEVERE: notable and sustained muscle contraction which patient is not able to fully correct, with substantial/sustained impact on posture. Patient notably distressed.						
Observed dystonia						
Details – name affected body part (e.g. head, extremities, trunk):						
<b>DYSKINESIA</b>						
SCORE: 0 = NONE: no symptoms, 1 = QUESTIONABLE: unclear if symptom present, 2 = MILD: infrequently present movements, which patient can suppress for extended periods of time, 3 = MODERATE: frequently persisting movements, which patient is only briefly able to suppress, 4 = SEVERE: continuously present movements, which patient is not able to completely suppress, even for brief periods of time						
Face and mouth – with activation						
Tongue – with activation						
Upper extremities – arms, hands	R	R	R	R	R	R
	L	L	L	L	L	L
Trunk – neck, shoulders, hips						
Lower extremities – ankles/toes	R	R	R	R	R	R
	L	L	L	L	L	L
<b>OTHER MOTOR ABNORMALITIES</b>						

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## C. EXAMINATION/LABS

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**WHY MONITOR?** Schizophrenia<sup>9, 5</sup> and use of antipsychotics<sup>144, 20, 27, 33, 34, 377</sup> are independently associated with increased motor and metabolic abnormalities, which can contribute to non-adherence to medication, and increased morbidity and mortality<sup>7, 166, 199, 233, 288, 40, 41, 433, 444</sup>.

**MINIMUM MONITORING FREQUENCY:** For newly initiated medication: baseline, 1 (motor side effects only), 3 and 12 months. For persons on the same medication > 1 year: q 12 months.

## D. EXAMINATION PROCEDURE

**ALL “hands on” aspects of the examination should be done with passive movement of the person’s respective body part.**

SUBJECTIVE EXPERIENCE		
Screen	<p>Ask the person: “During the last week, have you...”</p> <ul style="list-style-type: none"> <li>a) noticed any shakes, muscle stiffness, or problems walking? (PARKINSONISM)</li> <li>b) noticed any abnormal body movements? (DYSKINESIA)</li> <li>c) felt restless or had the need to move even when you didn’t want to? (AKATHISIA)</li> <li>d) experienced any muscle spasms that lasted at least 1 minute? (DYSTONIA)</li> </ul> <p>If yes, explore and record the pertinent details.</p>	
<b>PARKINSONISM</b>	<i>Consists of motor disturbances, which include tremor, impaired gait/posture, postural instability, rigidity, reduced facial expression/speech, and bradykinesia.</i>	
Facial expression - reduced	Observe the person’s face for reduced facial expression, decreased blinking or parted lips.	
Hands - tremor (resting)	Observe the person’s hands for a resting tremor, with the person sitting with their elbows resting on their thighs and their hands hanging over their knees.	
Hands - tremor (arms extended, fingers apart)	Observe the person’s hands for a tremor, with their palms facing down and arms fully extended with fingers apart.	
Hands - bradykinesia	Ask the person to fully open and close their hands, one at a time, in rapid succession, observing for bradykinesia.	
Elbow - rigidity	Flex and extend the person’s arms, one at a time, with your thumb on their bicep tendon, noting rigidity (“cog-wheel” or “lead pipe”).	
Gait - abnormality	Observe the person’s gait either entering or exiting the room. Note evidence of stooped posture, shuffling gait, decreased arm swing or bradykinesia.	
<b>AKATHISIA</b>	<i>Consists of subjective feelings of inner restlessness with the urge to move, and/or objective movements such as restless movement of one extremity, changing position, rocking while standing or sitting, lifting feet as if marching on the spot, and inability to sit down for long periods with pacing back and forth.</i>	
Observed motor restlessness - lower limbs	The person should be observed (while seated) for a minimum of 5 minutes. A “severe” score should be reserved for persons who are unable to remain seated for the entire 5 minute time period, due to akathisia.	
<b>DYSTONIA</b>	<i>Characterized by muscles which are contracted, contorted and often painful, sometimes accompanied by repetitive jerking or twisting movements, resulting in the person’s assuming abnormal postures.</i>	
Observed dystonia - head, upper and lower extremities, trunk	The person’s entire head, neck, limbs and trunk should be observed while sitting or standing. The details of observed dystonias should be recorded.	
<b>DYSKINESIA</b>	<i>Characterized by movements that are repetitive, purposeless, and involuntary.</i>	
Muscles of face and mouth - with activation	While engaging the person in an activation activity (e.g. finger tapping), observe the person’s face and mouth, noting any frowning, blinking, grimacing, puckering, repetitive opening and closing of the mouth, clenching of the jaw or lateral movements of the jaw.	
Tongue - with activation	While engaging the person in an activation activity (e.g. finger tapping), with the person’s mouth open, observe for in and out or lateral movements of the tongue.	
Upper extremities - arms, hands	While the person is sitting in a chair, face the patient to observe for evidence of dyskinesias of the:	
Trunk - neck, shoulders, hips	<ul style="list-style-type: none"> <li>a) Arms and hands. Do NOT include tremor.</li> <li>b) Ankles and/or toes (including inversion/eversion of the foot).</li> <li>c) Neck, shoulders, hips (including rocking, twisting, squirming).</li> </ul>	
Lower extremities – ankles/toes		
<b>WAIST CIRCUMFERENCE</b>	<i>To determine waist circumference (WC), the measurer should stand beside the individual. WC is measured at the part of the torso located midway between the lowest rib and the iliac crest (top of pelvic bone). After the measurer locates and places the tip of the measuring tape at the landmark site, (1) ask the person to hold the tip of the tape in place and rotate 360 degrees while the measurer holds the remaining tape, ensuring that the tape measure is parallel to the floor and not twisted. (2) The measurer will then record the WC, after insuring that the tape is snug but not compressing any underlying soft tissue.</i>	
Gender and ethnic specific waist circumferences	The Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada provides a guideline for waist circumference targets based on gender and ethnicity. A table summarizing waist circumference measurements that lead to increased health risks is below.	
<b>Ethnic-Specific Values for Waist Circumference (WC)</b>		
<b>Country or Ethnic Group</b>		
European, Sub-Saharan African, Eastern Mediterranean and Middle Eastern (Arab)	94 (37.6) or greater	80 (32) or greater
South Asian, Chinese, Japanese, South and Central American	90 (36) or greater	80 (32) or greater



## E. REFERENCES

1. Adler LA, Angrist B, Reiter S, Rotrosen J. Neuroleptic Induced Akathisia: A Review. *J Psychopharmacol.* 1989;97:1–11.
2. Albanese A, Sorbi FD, Comella C, Jannah HA, Mink JW, Post B, Vidailhet M, Volkmann J, Warner TT, Leentjens AFG, et al. Dystonia Rating Scales: Critique and Recommendations. *Mov Disord.* 2013;28(7):874–883.
3. Alberti KGM, Zimmet P, Shaw J, IDF Epidemiology Task Force Consensus Group. The Metabolic Syndrome—A New Worldwide Definition. *Lancet.* 2005;366:1059–1062.
4. Anderson TJ, Grégoire J, Hegele RA, Couture P, Mancini GB, McPherson R, Francis GA, Poirier P, Lau DC, Grover S, et al. 2012 Update of the Canadian Cardiovascular Society Guidelines for the Diagnosis and Treatment of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult. *Can. J. Cardiol.* 2013;29:151–167.
5. Barnes TR. A Rating Scale for Drug-Induced Akathisia. *Br. J. Psychiatry.* 1989;154:672–676.
6. Browne S, Roe M, Lane A, Gervin M, Morris M, Kinsella A, Larkin C, Callaghan EO. Quality of Life in Schizophrenia: Relationship to Sociodemographic Factors, Symptomatology and Tardive Dyskinesia. *Acta Psychiatr Scand.* 1996;94:118–124.
7. Butler MJ, Chandrakanth J. Monitoring of extrapyramidal side effects in patients on antipsychotic treatment: A completed audit cycle. *Irish journal of psychological medicine.* 2016 Sep;33(3):165–9.
8. Canada, Health Canada. Canadian Guidelines for Body Weight Classification in Adults: Quick Reference Tool for Professionals. [Ottawa]: Health Canada; 2003.
9. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes.* 2013;37 (Suppl 1):S1–212.
10. Canadian Physical Activity Guidelines: 2011 Scientific Statements. Canadian Society for Exercise Physiology. 2011. Available from [www.csep.ca/guidelines](http://www.csep.ca/guidelines).
11. Chouinard G, Margolese HC. Manual for the Extrapyramidal Symptom Rating Scale (ESRS). *Schiz Res.* 2005;76:247–265.
12. Cohn TA, Sernyak MJ. In Review: Metabolic Monitoring for Patients Treated with Antipsychotic Medications. *Can J Psych.* 2006;51(8):492–501.
13. Colosimo C, Martínez-Martín P, Fabbrini G, Hauser RA, Merello M, Miyasaki J, Poewe W, Sampaio C, Rascol O, Stebbins GT, et al. Task Force Report on Scales to Assess Dyskinesia in Parkinson's Disease: Critique and Recommendations. *Mov Disord.* 2010;25(9):1131–1142.
14. Correll CU, Manu P, Olshanskiy V, Napolitano B, Kane JM, Malhotra AK. Cardiometabolic Risk of Second-Generation Antipsychotic Medications During First-Time Use in Children and Adolescents. *JAMA.* 2009;302(16):1765–1773.
15. Cortese L, Jog M, McAuley TJ, Kotteda V, Costa G. Assessing and Monitoring Antipsychotic-Induced Movement Disorders in Hospitalized Patients: A Cautionary Study. *Can J Psychiatry.* 2004;49(1):31–36.
16. De Hert M, Peuskens B, van Winkel R, Kalnicka D, Hanssens L, Van Eyck D, Wyckaert S, Peuskens J. Body Weight and Self-Esteem in Patients with Schizophrenia Evaluated with B-WISE. *Schizophr Res.* 2006;88:222–226.
17. Dean CE, Russell JM, Kuskowski MA, Caligiuri MP, Nugent SM. Clinical Rating Scales and Instruments: How Do They Compare in Assessing Abnormal, Involuntary Movements? *J Clin Psychopharmacology.* 2004;24(3):298–304.
18. Fahn S, Elton RL, Members of the UPDRS Development Committee. Unified Parkinson's Disease Rating Scale. In: Fahn S, Marsden CD, Calne DB, Lieberman A, eds. Recent Developments In Parkinson's Disease. Florham Park, NJ: Macmillan Health Care Information 1987;153–163, 293–304.
19. Fleischhacker WW, Meise U, Günther V, Kurz M. Compliance with Antipsychotic Drug Treatment: Influence of Side Effects. *Acta Psychiatr Scand Suppl.* 1994;382:11–15.
20. Foley DL, Morley KI. Systematic Review of Early Cardiometabolic Outcomes of the First Treated Episode of Psychosis. *Arch Gen Psychiatry.* 2011;68(6):609–616.
21. Gervin M, Barnes TRE. Assessment of Drug-Related Movement Disorders in Schizophrenia. *Adv Psychiatr Treat.* 2000;6:332–343.
22. Guy W. ECDEU Assessment Manual for Psychopharmacology. Washington, DC: U.S. Dept. of Health, Education, and Welfare. 1976:534–537.
23. Hawley CJ, Fineberg N, Roberts AG, Baldwin D, Sahadevan A, Sharman V. The Use of the Simpson Angus Scale for the Assessment of Movement Disorder: A Training Guide. *Int J Psychiatry Clin Pract.* 2003;7:249–257.
24. Hogan TP, Awad AG. Subjective Response to Neuroleptics and Outcome in Schizophrenia: A Re-Examination Comparing Two Measures. *Psychol Med.* 1992;22(2):347–352.
25. Knol W, Keijsers CJ, Jansen PA, van Marum RJ. Systematic Evaluation of Rating Scales for Drug-Induced Parkinsonism and Recommendations for Future Research. *J Clin Psychopharmacol.* 2010;30(1):57–63.
26. Loonen AJM, Doorschot CH, van Hemert DA, Oostelbos MCJM, Sijben AES, The MASEAS Team. The Schedule for the Assessment of Drug-Induced Movement Disorders (SADIMoD): Test-Retest Reliability and Concurrent Validity. *Int J Neuropsychopharmacol.* 2000;3:285–296.
27. Macayan L, Correll CU. Weight Gain and Metabolic Risks Associated with Antipsychotic Medications in Children and Adolescents. *J Child Adolesc Psychopharmacol.* 2011;21:517–535.
28. Margolese HC, Chouinard G, Walters-Larach V, Beauclair L. Relationship Between Antipsychotic-Induced Akathisia and Tardive Dyskinesia and Suicidality in Schizophrenia: Impact of Clozapine and Olanzapine. *Acta Psychiatr Belg.* 2001;101:128–144.
29. Mathews M, Gratz S, Adetunji B, George V, Mathews M, Basil B. Antipsychotic-Induced Movement Disorders: Evaluation and Treatment. *Psychiatry.* 2005 (March):36–41.
30. McEvoy JP, Meyer JM, Goff DC, Nasrallah HA, Davis SM, Sullivan L, Meltzer HY, Hsiao J, Scott Stroup T, Lieberman JA. Prevalence of the Metabolic Syndrome in Patients with Schizophrenia: Baseline Results from the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) Schizophrenia Trial and Comparison with National Estimates from NHANES III. *Schizophr Res.* 2005;80(1):19–32.
31. Mitchell AJ, Delaloye V, Vancampfort D, Correll CU, De Hert M. Guideline Concordant Monitoring of Metabolic Risk in People Treated with Antipsychotic Medication: Systematic Review and Meta-Analysis of Screening Practices. *Psychol Med.* 2012;42:125–147.
32. Mitchell AJ, Vancampfort D, De Hert A, Yu W, De Hert M. 2013. Is the Prevalence of Metabolic Syndrome and Metabolic Abnormalities Increased in Early Schizophrenia? A Comparative Meta-Analysis of First Episode, Untreated and Treated Patients. *Schizophr Bull.* 2013;39:295–305.
33. Newcomer JW, Haupt DW. In Review: The Metabolic Effects of Antipsychotic Medications. *Can J Psychiatry.* 2006;51:480–491.
34. Newcomer JW. Second-Generation (Atypical) Antipsychotics and Metabolic Effects: A Comprehensive Literature Review. *CNS Drugs.* 2005;19 (Suppl 1):1–93.
35. Pappa S, Dazzan P. Spontaneous Movement Disorders in Antipsychotic-Naïve Patients with First-Episode Psychoses: A Systematic Review. *Psychol Med.* 2009;39:1065–1076.
36. Public Health Agency of Canada. Hypertension. [Internet] 2009. Available from: <http://www.phac-aspc.gc.ca/cd-mc/cvd-mcv/hypertension-eng.php>
37. Rummel-Kluge C, Komossa K, Schwarz S, Hunger H, Schmid F, Lobos CA, Kissling W, Davis JM, Leucht S. Head-to-Head Comparisons of Metabolic Side Effects of Second Generation Antipsychotics in the Treatment of Schizophrenia: A Systematic Review and Meta-Analysis. *Schizophr Res.* 2010;123:225–233.
38. Simpson GM, Angus JWS. A Rating Scale for Extrapyramidal Side Effects. *Acta Psychiatr Scand.* 1970;21:211–19.
39. Stomski NJ, Morrison P, Meyer A. Antipsychotic medication side effect assessment tools: A systematic review. *Australian & New Zealand Journal of Psychiatry.* 2016 May;50(5):399–409.
40. Vancampfort D, Probst M, Schewe T, Maurissen K, Sweers K, Knapen J, De Hert M. Lack of Physical Activity During Leisure Time Contributes to an Impaired Health Related Quality of Life in Patients with Schizophrenia. *Schizophr Res.* 2011;139:122–127.
41. Vancampfort D, Sweers K, Probst M, Maurissen K, Knapen J, Minguet P, De Hert M. The Association of the Metabolic Syndrome with Physical Activity Performance in Patients with Schizophrenia. *Diabetes Metab.* 2011;37:318–323.
42. Warburton DE, Charlesworth S, Ivey A, Nettlefold L, Bredin SS. A Systematic Review of the Evidence for Canada's Physical Activity Guidelines for Adults. *Int J Behav Nutr Phys Act.* 2010;7(1):39.
43. Weiden PJ, Mackell JA, McDonnell DD. Obesity as a Risk Factor for Antipsychotic Noncompliance. *Schizophr Res.* 2004;66:51–57.
44. Weinmann S, Read J, Aderhold V. Influence of Antipsychotics on Mortality in Schizophrenia: Systematic Review. *Schizophr Res.* 2009;113(1):1–11.
45. Wharton S, Sharma AM, Lau DCW. Weight Management in Diabetes. *Can J Diabetes.* 2013;37:582–586.

## F. AUTHORS

Co-created for the Canadian Consortium for Early Intervention in Psychosis by:

### Thomas Hastings, MD, FRCPC

Associate Clinical Professor, Department of Psychiatry, McMaster University  
Hamilton, Ontario  
Lecturer, Department of General Psychiatry, University of Toronto  
Toronto, Ontario  
Address for correspondence: [tom.hastingsMD@gmail.com](mailto:tom.hastingsMD@gmail.com)

### Marco Solmi, MD, PhD, Psychiatrist

Director of Research, Psychiatry Department, University of Ottawa  
Associate Professor, Psychiatry Department, University of Ottawa  
Ottawa, Ontario  
Medical Director, On Track First Episode Psychosis Early Intervention Service  
Medical Director, Eating Disorder Program  
Department of Mental Health, The Ottawa Hospital  
Ottawa, ON

### Phil Tibbo, MD, FRCPC

Professor and Dr Paul Janssen Chair in Psychotic Disorders, Department of Psychiatry  
Dalhousie University  
Halifax, Nova Scotia  
Director, Nova Scotia Early Psychosis Program  
Halifax, Nova Scotia

### Richard Williams, MD, FRCPC

Director of Schizophrenia Service, Vancouver Island Health Authority  
Victoria, British Columbia  
Adjunct Professor of Psychology, University of Victoria  
Victoria, British Columbia  
Clinical Professor, Department of Psychiatry, University of British Columbia  
Victoria, British Columbia



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