Appendix 1. Guidelines and Measure-Specific Testing Results

Metabolic Screening for Children and Adolescents Newly on Antipsychotics

Guidelines for Metabolic Screening and Monitoring in Children and Adolescents on Antipsychotics

Organization (Date)	Recommendation	Type/Grade
AACAP-AAA (2011) Practice parameter for the use of atypical antipsychotic medications in children and adolescents.[1]	"The acute and long-term safety of these medications in children and adolescents has not been fully evaluated and therefore careful and frequent monitoring of side effects should be performed…*Ideally, monitoring of BMI, blood pressure, fasting glucose and fasting lipid profiles should follow, whenever feasible, the recommendations found in the consensus statement put forth by the American Diabetes Association and American Psychiatric Association."* Table: Fasting plasma glucose—Baseline, 12 wks, annually; Fasting lipid profile—Baseline, 12 wks (Recommendation 10, and Table 2)	Clinical Guideline
	"Careful attention should be given to the increased risk of developing diabetes with the use of AAA, and blood glucose and other parameters should be assessed at baseline and monitored at regular intervals."(Recommendation 12)	Clinical Standard
	"In those patients with significant weight changes and/or a family history indicating high risk, lipid profiles should be obtained at baseline and monitored at regular intervals."(Recommendation 13)	Clinical Guideline
AACAP-BP (2007) Practice parameter for the assessment and treatment of children and adolescents with bipolar disorder.[3]	"Psychopharmacological interventions require baseline and follow-up symptom, side effect, and laboratory monitoring as indicated….*The American Diabetes Association's recommendations for managing weight gain for patients taking antipsychotics should be followed. This includes baseline BMI, waist circumference, blood pressure, fasting glucose, and a fasting lipid panel. The BMI should be followed monthly for 3 months and then quarterly. Blood pressure, fasting glucose and lipids should be followed up after 3 months then yearly*." (Recommendation 8)	Minimal Standard
AACAP-SZ (2001) Practice parameter for the assessment and treatment of children and adolescents with schizophrenia.[2]	"The use of antipsychotic agents requires….. documentation any required baseline and follow-up laboratory monitoring..."	Minimal Standard
CAMESA (2011) Canadian Alliance for Monitoring Effectiveness and Safety of Antipsychotics in Children—Evidence-based recommendations for monitoring safety of second generation antipsychotics in children and youth.[4]	The guideline provides antipsychotic medication-specific recommendations for monitoring physical examination maneuvers (height, weight, BMI, waist circumference, blood pressure, and neurological examination for extrapyramidal symptoms), and laboratory tests (glucose, insulin, lipid profile tests, AST, ALT, prolactin, and TSH) for children on AAAs. The GRADE rating system is used to rate each test, for each medication, at each time point examined (baseline, 3, 6, and 12 months). In recognition that clinicians may not have the resources to apply drug specific recommendations, the guideline developers also created a simplified version of the recommendations. *Summary recommendation:* All children prescribed AAAs should be monitored for metabolic side effects at baseline, 3, 6, and 12 months with the following tests: fasting glucose, fasting insulin, and fasting lipid profile (total cholesterol, LDL, HDL, TG). *(Note: Fasting insulin is not recommended for youth on aripiprazole, but is appropriate for all other AAAs.)*	Ranges from 1A (strong) to not recommended depending on the specific medication, laboratory test and timeframe. Strongest evidence and recommendations are for baseline tests.
	A baseline fasting glucose is recommended for all children and adolescents on AAAs (strong recommendation/low quality evidence all AAAs except Ziprasidone, weak recommendation/ consensus based).	1C (all AAA except Ziprasidone) 3 (Zip=3)
	A baseline fasting lipid profile is recommended for all children and adolescents on AAAs (strong recommendation with high to low evidence depending upon the AAA, except Ziprasidone, weak recommendation/consensus based).	1A-1C (all AAAs except Ziprasidone) 3 (Zip=3)

Organization (Date)	Recommendation	Type/Grade
	A follow-up fasting glucose and fasting lipid panel (one or more of the tests within the panel) is strongly recommended for all children at one or more time points during the year. (strong recommendation/high-moderate-low evidence for all AAAs, except Ziprasidone, weak recommendation/consensus based).	1A-1C (all AAAs except Ziprasidone) 3 (Zip=3)
PPWG (2007) The AACAP-sponsored Preschool Psychopharmacology Working Group—Psychopharmacological treatment for very young children: Contexts and guidelines.[5]	"Use of AAA should follow the AACAP practice parameter on AAAs. This practice parameter describes the minimum standards for monitoring vital signs, BMI, fasting blood glucose, extrapyramidal symptoms, lipid profiles, and electrocardiography." (Disruptive Behaviors Algorithm, Stage 2: Pharmacological Intervention).	Not specified
T-MAY (2012) Center for Education and Research on Mental Health Therapeutics—Treatment of maladaptive aggression in youth.[6]	Practitioners should conduct appropriate, guideline-based laboratory monitoring.	Evidence: A, Recommendation: Very strong
TX (2010) Texas Department of Family and Protective Services—Psychotropic medication utilization parameters for foster children.[7]	Practitioners should document appropriate monitoring of laboratory findings.	Not specified*

*TX (2010) did not specify the use of a rating system.

Grading System Key

Guideline Developer	Definition
AACAP	*Minimal Standard/ Clinical Standard:* Rigorous/substantial empirical evidence (meta-analyses, systematic reviews, RCTs) and/or overwhelming clinical consensus; expected to apply more than 95 percent of the time
	Clinical guidelines: Strong empirical evidence (nonrandomized controlled trials, cohort or case-control studies), and/or strong clinical consensus; expect to apply in most cases (75% of the time)
	Options: Acceptable but not required; there may be insufficient evidence to support higher recommendation (uncontrolled trials, case/ series reports).
	Not endorsed: Ineffective or contraindicated.
AACAP endorsed best-practice principles	Best-practice principles that underlie medication prescribing, to promote the appropriate and safe use of psychotropic medications
CAMESA	GRADE[8,9]
	1A: Strong recommendation, High-quality evidence
	1B: Strong recommendation, Moderate-quality evidence
	1C: Strong recommendation/ Low-quality evidence
	2A: Weak recommendation, High- or moderate-quality evidence
	2B: Weak recommendation, Low-quality evidence
	3: Weak recommendation, No evidence, consensus based
PPWG	*A:* Well controlled RCTs, large meta-analyses, or overwhelming clinical consensus
	B: Empirical evidence (open trials, case series) or strong clinical consensus
	C: Single case reports or no published reports, recommendation developed by expert consensus (informal)

Guideline Developer	Definition
TMAY Ratings	Oxford Centre for Evidence-Based Medicine grade of evidence (A-D)[10] *Strength of Recommendation:* Very strong (≥90% agreement) *Strength of Recommendation:* Very strong (70-89% agreement) *Strength of Recommendation:* Very strong (50-69% agreement) *Strength of Recommendation:* Very strong (<50% agreement)

References for Guidelines

American Academy of Child and Adolescent Psychiatry. Practice Parameter for the Use of Atypical Antipsychotic Medications in Children and Adolescents. http://www.aacap.org/App_Themes/AACAP/docs/practice_parameters/ Atypical_Antipsychotic_Medications_Web.pdf. (Accessed Jul 12, 2012)

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Measure-Specific Testing Results

Table 1. Proportion of Children/Adolescents with a New Antipsychotic Medication Prescription who Received Metabolic Screening by Race/Ethnicity among General and Foster Care Populations

Race/Ethnicity	General Population (%)	Foster Care (%)
White Non-Hispanic	5.7	7.5
Black Non-Hispanic	6.1	7.4
Hispanic	10.3	13.6
Other	9.3	6.8
Unknown	5.1	2.7

Table 2. Average State Performance by Population

	General Population (%)	Foster Care Population (%)
Percentage of children receiving both glucose and lipid screening	6.0	6.3

Table 3. Proportion of Children with a New Antipsychotic Medication Prescription who Received Metabolic Screening by Rurality/Urbanicity among General and Foster Care Populations

Urbanicity at the County Level	**General Population (%)**	**Foster Care Population (%)**
Metropolitan	6.8	7.9
Non-metropolitan	5.1	6.1
Rural	5.5	6.3

Table 4. Metabolic Screening in Children and Adolescents Newly Prescribed Antipsychotics by State

	General Population			**Foster Care Population**		
STATE	**%**	**Numerator**	**Denominator**	**%**	**Numerator**	**Denominator**
AZ	14.0	331	2,362	12.2	29	237
CA	10.7	1000	9,323	13.2	285	2,152
GA	3.8	148	3,856	2.2	14	651
IN	2.6	147	5,607	4.4	21	481
KS	5.5	90	1,633	7.3	35	478
KY	4.8	168	3,490	6.0	27	451
MI	6.3	390	6,196	7.0	65	929
MO	4.5	192	4,249	5.8	50	855
NM	8.3	97	1,164	8.0	9	113
NY	5.3	451	8,485	3.3	36	1,100
RI	0.4	2	510	0.0	0	100
Min	0.4	2	510	0.0	0	100
25th	3.8	97	1633	3.3	14	237
Median	5.3	168	3856	6.0	29	481
Mean	6.0	274	4261	6.3	52	686
75th	8.3	390	6196	8.0	50	929
Max	14.0	1000	9323	13.2	285	2152

Data source: MAX 2008

Table 5. Metabolic Screening in Children and Adolescents Newly Prescribed Antipsychotics by Health Plan

Plan	%	Denominator	Numerator
Plan 1	12.8	626	80
Plan 2	15.4	1371	211
Plan 3	0.2	441	1
Plan 4	9.3	592	55
Plan 5	10.6	1719	182
Plan 6	12.3	960	118
Plan 7	5.1	177	9
Plan 8	12.6	1357	171
Plan 9	4.9	325	16
Plan 10	10.6	123	13
Plan 11	6.1	164	10
Plan 12	13.3	939	125
Plan 13	17.8	736	131
Plan 14	7.1	155	11
Plan 15	10.8	638	69
Plan 16	10.6	66	7
Plan 17	14.8	256	38
Min	0.2	66	1
25th	7.1	177	11
Median	10.6	592.0	55.0
Mean	10.3	626.2	73.4
75th	12.8	939	125
Max	17.8	1719	211

Data Source: NYS Medicaid Managed Care Plan Data, 2010

Note: Youth are continuous eligible with the plan for 4 months prior and 1 month following the new script. Excludes dual eligibles