OSU Oregon State University College of Pharmacy

Drug Use Research & Management Program

OHA Division of Medical Assistance Programs
500 Summer Street NE, E35; Salem, OR 97301-107
Phone 503-947-5220 | Fax 503-947-1119

DIVISION OF MEDICAL ASSISTANCE PROGRAMS
Policy & Planning Section
John A. Kitzhaber, MD, Governor

Oregon Health Authority
500 Summer Street NE, E35
Salem, Oregon 97301-1077
Voice: (503) 945-6513
Fax: (503) 947-1119

Metabolic Monitoring of Antipsychotics in Children

Recommendations

- Fax quarterly reports to providers addressing the absence of glucose monitoring in children receiving antipsychotics
- Reports to contain:
  - Dashboard comparing the target provider to other Medicaid providers and providers within their specialty
  - Educational materials highlighting recommendations for monitoring and management of metabolic abnormalities in children
  - Provide list of patient without claims for glucose monitoring within the past 6 months
  - Form indicating the status of metabolic monitoring for each patient for the provider to complete and return to the Medical Assistance Program

Background

Awareness of mental health disorders in children has increased in recent years, with an estimated 15-25% of children in the United States having a diagnosable mental health disorder.[1] Data from 2001-2002 showed 13.5% of all child welfare patients were receiving psychotropics.[2] As of January 2013, 18.5% of children in the Oregon Child Welfare Program received at least one psychotropic. Of these, 48% received at least one antipsychotic. In the entire Medicaid program, 29% (3,115 of 10588) of children receiving any psychotropic received at least one antipsychotic. Although the use of antipsychotics in children is controversial, based on available claims data, it is not uncommon for the children covered by the Oregon Medicaid program to receive antipsychotics. In light of the prevalence of antipsychotic use in children, an understanding of appropriate use and adequate monitoring practices are essential for all prescribers.

The metabolic risks of antipsychotic medications are well documented in three systematic reviews, including a 2012 report from Agency for Healthcare Research and Quality (AHRQ).[3–5] Second generation antipsychotics (SGAs) have an FDA warning about the risk of metabolic abnormalities but First Generation Antipsychotics (FGAs) also are associated with metabolic effects. SGAs described as "weight neutral" are neutral when compared to a FGA (typically lower dose haloperidol).[3,4] However, both SGAs and FGAs have been demonstrated to have some amount of weight gain upon initiation of therapy.[6–8] Children may be particularly susceptible to the metabolic effects of antipsychotics.[9] Despite FDA

Metric	Medication	Mean	(95% CI)	p Value
Weight (kg)				
	Aripiprazole	4.44	(3.71 to 5.18)	<.001
	Olanzapine	8.54	(7.38 to 9.69)	<.001
	Quetiapine	6.06	(4.90 to 7.21)	<.001
	Risperidone	5.34	(4.81 to 5.87)	<.001
	Untreated	0.19	(−1.04 to 1.43)	0.77
Waist, cm				
	Aripiprazole	5.4	(2.87 to 7.93)	<.001
	Olanzapine	8.55	(7.43 to 9.67)	<.001
	Quetiapine	5.27	(4.07 to 6.47)	<.001
	Risperidone	5.1	(4.49 to 5.71)	<.001
	Untreated	0.7	(−0.87 to 2.27)	0.4
Glucose, mg/dL				
	Aripiprazole	0.54	(−2.85 to 3.93)	0.76
	Olanzapine	3.14	(0.69 to 5.59)	0.02
	Quetiapine	2.64	(−0.65 to 5.93)	0.12
	Risperidone	1.14	(−0.84 to 3.12)	0.26
	Untreated	0.69	(−4.84 to 6.22)	0.81

Table 1. Changes in metabolic parameters in antipsychotic naïve children and adolescents.[8]

recommendations, consensus guidelines, and primary literature highlighting the importance of monitoring for metabolic abnormalities, two recent, well designed retrospective cohort studies suggested that glucose and lipid monitoring rates continue to be low in adults and children.[10,11] The annual glucose monitoring rates for children receiving antipsychotics were 59% and 60% for the first two quarters of the 2012-2013 Federal Fiscal Year (FFY) in the Oregon Medicaid program.

Recommended schedules for monitoring of glucose and lipids have been proposed by multiple groups including the American Diabetes Association (ADA), American Psychiatric Association, and American Association of Clinical Endocrinologists.[12,13] The ADA recommends monitoring of blood glucose, blood pressure and waist circumference at initiation of therapy, 12 weeks, and annually thereafter. Body Mass Index (BMI) monitoring is recommended at baseline and every four weeks for 12 weeks and quarterly for the first year. Lipids checks are recommended at baseline, 12 weeks and every 5 years. More frequent monitoring may be indicated based on patient-specific factors. Patient specific factors include a personal or family history of diabetes, metabolic syndrome, or cardiovascular disease.

There is a lack of long term clinical data to define metrics and risk thresholds predicting development of diabetes and cardiovascular disease on which to base diagnostic criteria for metabolic syndrome in children.[14] In 2007, the International Diabetes Federation (IDF) developed consensus guidelines for the diagnosis of metabolic syndrome in children.[14] These guidelines synthesized recommendations from the ADA, the World Health Organization, and National Cholesterol Education Program. The IDF guidelines use waist circumference plus two other risk factors as diagnostic criteria. Waist circumference has been show to predict metabolic syndrome with similar accuracy to BMI when gender, age and ethnic group have been considered.[14] The IDF Guidelines define three age groups: 6-9 years, 10-15 years, and 16 and older. The IDF concluded diagnosis of metabolic syndrome in children under 10 years was determined unreliable. Monitoring of children less than 10 years with waist circumferences greater that the 90th percentile may be warranted in patients with a family history of diabetes or cardiovascular disease.

Critera for Metabolic Syndrome in Children and Adolescents

Age group (years)	Obesity Waist Circumference‡		Triglycerides	HDL-C	Blood pressure	Fasting Plasma Glucose
6–<10	>=90th percentile	Plus two or more of the following	Metabolic Syndrome cannot be diagnosed in this age group, but additional testing may be warranted for patients with a family history of risk factors			
10–<16	>=90th percentile or adult cut-off whichever is lower		>=150 mg/dL	<40 mg/dL	Systolic >=130mmHg or Diastolic >=85mm Hg	>=100 mg/dL or T2DM
16+ (Adult criteria)	Male >= 90 cm* Female >=80 cm¥		>=150 mg/dL	Male <40 mg/dL Female <50 mg/dL	Systolic >=130mmHg or Diastolic >=85mm Hg	>=100 mg/dL
			Or Active Lipid Treatment		Or Active Treatment	Or T2DM

Table 2 International Diabetes Federation criteria for metabolic syndrome. Adapted from *Diabetes*. 2007;8(5):299–306 and *Diabetes Voice*. 2005;50(3):31–33.[14,15]

Several national and state agencies have proposed standard metrics for the monitoring of antipsychotics. The National Committee for Quality Assurance (NCQA) added four antipsychotic-

related measures to the Healthcare Effectiveness Data and Information Set (HEDIS®) 2013 specification, including two specifically addressing glucose abnormalities associated with antipsychotics.[16] In April 2013, NCQA also posted draft measures for the monitoring metabolic abnormalities of antipsychotics in children.[17] The Oregon Health Authority (OHA) was awarded a technical assistance grant from the Center for Health Care Strategies (CHCS) to improve the use of psychotropics in foster children.[18] Part of the work under this grant has been the development of standard quality metrics for psychotropic use, which includes monitoring of glucose abnormalities for children receiving antipsychotic therapy. These quality metrics are now being reported to the Coordinated Care Organizations (CCO) along with detailed provider and patient information with the goal of improving rates of metabolic monitoring across all of Medicaid. The following RetroDUR intervention is proposed with the goal of improving the frequency of glucose monitoring for children receiving antipsychotics in the Fee For Service (FFS) program.

RetroDUR Intervention

Reminders to perform annual glucose monitoring in children receiving antipsychotics were sent to prescribers via fax in October and November of 2012. The results as reported by providers appear in Table 3. The overall response rate was 30%, with providers indicating that 57% of patients listed were scheduled for testing based on this notification. This program will be modified and expanded with reports sent to providers quarterly (see Appendix A for proposed provider report format). An expanded educational message explaining the importance of metabolic monitoring will be included along with a list of patients without a claims history indicating metabolic monitoring within the last 12 months.

Results by Patient Count	#	%
No Response	1,716	70
Response Received	746	30
Already Tested	240	32
Newly Scheduled Test	425	57
Not my patient	140	19

Table 3. Responses to Fall 2012 metabolic monitoring fax campaign.

Counts represent unique patient counts. More than one response sub-type (already tested, newly scheduled test, etc.) was allowed for each patient.

Providers will be notified of a particular patient only once every 12 months. Delays in claim submission, combined with the day-to-day constraints on contacting patients and scheduling tests suggests more frequent notifications may include patients for which testing has already been performed.

The notification report will include a request that providers respond with the status of monitoring (e.g. already tested, newly scheduled, testing unnecessary, etc.). Messages will only be sent for FFS patients. Providers can request a report for all of their FFS and CCO patients.

A report card allows providers to compare their monitoring practices to other providers. Current metabolic monitoring rates by provider specialty appear in Table 4. These values are based on the CHCS data specification (Appendix B) and reflect total Medicaid monitoring rates, not just FFS.

	Provider Type			Medicaid		
Provider	**Numerator**	**Denominator**	**%**	**Numerator**	**Denominator**	**%**
NURSE PRACTITIONER - FAMILY	27	42	64%	1,320	2,453	54%
NURSE PRACTITIONER - PEDIATRICS: PEDIATRICS	41	64	64%			
NURSE PRACTITIONER - PSYCHIATRIC/MENTAL HEALTH	196	438	45%			
PHYSICIAN ASSISTANT	10	25	40%			
PHYSICIAN ASSISTANT - MEDICAL	8	17	47%			
PHYSICIAN-FAMILY MEDICINE	107	163	66%			
PHYSICIAN-PEDIATRICS	247	356	69%			
PHYSICIAN-PEDIATRICS-ADOLESCENT MEDICINE	23	36	64%			
PHYSICIAN-PEDIATRICS-DEVELOPMENTAL BEHAVORIAL PEDIATRICS	37	56	66%			
PHYSICIAN-PSYCHIATRY&NEUROLGY-CHILD&ADOLESCENT PSYCHIATRY	305	614	50%			
PHYSICIAN-PSYCHIATRY&NEUROLOGY-FORENSIC PSYCHIATRY	15	61	25%			
PHYSICIAN-PSYCHIATRY&NEUROLOGY-PSYCHIATRY	197	369	53%			
REGISTERED NURSE - PSYCHIATRIC/MENTAL HEALTH	6	22	27%			
SPECIALIST	23	37	62%			
STUDENT IN AN ORGANIZED HEALTH CARE EDUCATION/TRAINING PROGRAM	25	51	49%			

Sub-specialties are based on NPI Registry primary taxonomy and related codes and descriptions
Lower than the Overall Medicaid Rate
Higher than the Overall Medicaid Rate

Table 4 – Rates of children receiving antipsychotic medications without annual blood glucose screening

The following metrics will be monitored quarterly as part of the RetroDUR activity report:

- Member Profiles Sent
- Member With Responses
- Members With Newly Scheduled Monitoring
- New Onset Diabetes Identified
- Response Rate (members)
- Providers Contacted
- Provider Responses
- Response Rate (providers)
- Provider Agree With Recommendation

Using the same CHCS data specification, changes in monitoring rates will also be presented as part of the quarterly RetroDUR reports (Table 5). These data have been presented to the P & T Committee in the past in a different format. The new format includes several metrics not directly related to this metabolic monitoring program, but are part of the Psychotropic Use in Children program.[19]

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Pediatric Psychotropic Quarterly Report

Fee For Service

Fiscal Year 2012 - 2013

Metric	First Quarter Oct - Dec			Second Quarter Jan - Mar		
	Numerator	Denominator	%	Numerator	Denominator	%
Children on Antipsychotics without diabetes screen	367	622	59%	344	577	60%
Five or more concurrent psychotropics	30	2,163	1%	29	2,152	1%
Three or more concurrent psychotropics	354	2,163	16%	350	2,152	16%
Two or More Concurrent Antipsychotics	28	2,163	1%	21	2,152	1%
Under 18 years old on any antipsychotic	623	2,163	29%	578	2,152	27%
Youth five years and younger on psychotropics	49	2,017	2%	54	2,152	3%

Table 5. RetroDUR Pediatric Psychotropic Quarterly Report

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Appendix A: Antipsychotic Metabolic Monitoring Provider Report

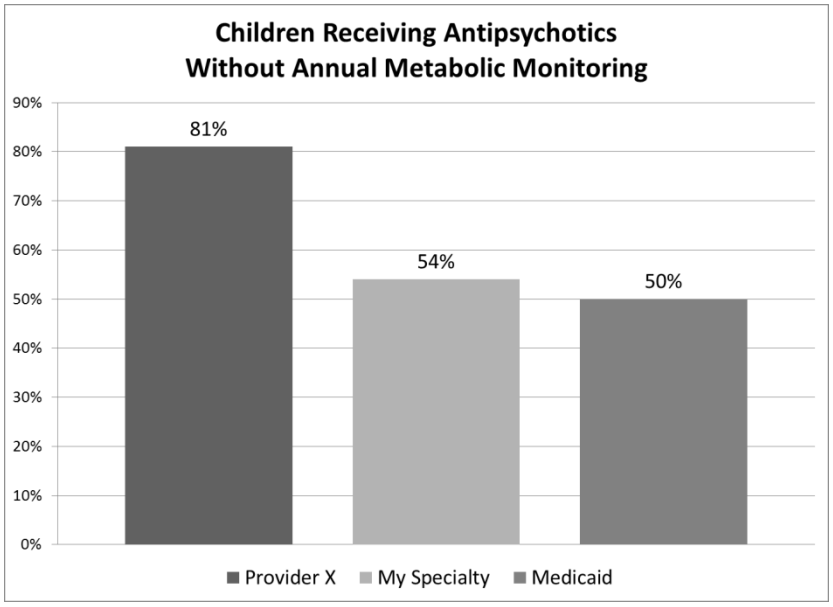
Date: mm/dd/yyyy

Attention: Provider X
Fax: 541-123-4567

Re: Your pediatric patients receiving antipsychotics without claims for routine glucose monitoring

The FDA issued a safety warning for all second generation antipsychotics recommending monitoring of blood glucose.[20] Careful monitoring for metabolic abnormalities (body composition, lipids, glucose, blood pressure) is the standard of care when prescribing antipsychotics.

The following pages contain a list of Fee-For-Service (FFS) Medicaid patients that you are identified by the pharmacy claim as the most recent prescriber of an antipsychotic and who do not have annual glucose screening claims. We understand claims data do not always reflect actual testing, that laboratory claims may be delayed and errors are made in prescriber identification.



The chart above reflects the proportion of patients **without** annual glucose screening who recently filled an antipsychotic prescription indicating you are the prescriber. Overall Medicaid rates and rates for your specialty are included for reference.

Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes (2004) Diabetes Care, 27(2), 596-601

	Baseline	4 wks	8 wks	12 wks	Quarterly	Annually	Q 5 Yr
Personal/ Family History	X					X	
Weight	X	X	X	X	X		
Waist Circumference	X			X		X	
Blood Pressure	X			X		X	
Fasting Blood Glucose	X			X		X	
Lipids	X			X			X

Use the following form to indicate the status of glucose testing. Please fax this report within 30 days to the Medical Assistance Program at 503-947-2596.

If you have any questions, or would like a complete list of all of your Medicaid patients (FFS and Coordinated Care Organization), please fax your request to 503-947-2596 or call at 503-945-6513.

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Metabolic Syndrome Detection and Management

The 2007 International Diabetes Federation[1] consensus guidelines for the diagnosis of metabolic syndrome in children synthesized recommendations from the ADA, the World Health Organization, and National Cholesterol Education Program (see table below).

- Weight is not a reliable surrogate marker for glucose and lipid irregularities. Waist circumference predicts metabolic syndrome similarly to body mass index when gender, age and ethnic group have been considered.[1]
- The metabolic effect profiles vary from one antipsychotic to another thus changing antipsychotics is an option to manage metabolic abnormalities for some patients.[2]
- A meta-analysis found individual and group non-pharmacological interventions such as cognitive behavioral therapy and diet and exercise counseling reduce mean body weight (-2.56kg) and BMI (-0.91kg/m^2) in adults, but studies in children are lacking.[3]
- Pharmacologic strategies to mitigate weight gain include:[4]
  - Metformin may prevent new weight gain in antipsychotic-naïve patients and patients who have gained weight due to antipsychotic therapy.[5,6]
  - A recent meta-analysis found only metformin, d-fenfluramine, and topiramate superior to placebo at reducing weight gain.[7]
  - Methylphenidate, dextroamphetamine, amantadine, orlistat, famotidine and rosiglitazone **all failed to show significant advantages** compared to placebo.[7,8]

Changes in metabolic parameters in antipsychotic naïve children and adolescents after 12 weeks

Metric	Medication	Mean	(95% CI)	p Value
Weight (kg)				
	Aripiprazole	4.44	(3.71 to 5.18)	<.001
	Olanzapine	8.54	(7.38 to 9.69)	<.001
	Quetiapine	6.06	(4.90 to 7.21)	<.001
	Risperidone	5.34	(4.81 to 5.87)	<.001
	Untreated	0.19	(−1.04 to 1.43)	0.77
Waist, cm				
	Aripiprazole	5.4	(2.87 to 7.93)	<.001
	Olanzapine	8.55	(7.43 to 9.67)	<.001
	Quetiapine	5.27	(4.07 to 6.47)	<.001
	Risperidone	5.1	(4.49 to 5.71)	<.001
	Untreated	0.7	(−0.87 to 2.27)	0.4
Glucose, mg/dL				
	Aripiprazole	0.54	(−2.85 to 3.93)	0.76
	Olanzapine	3.14	(0.69 to 5.59)	0.02
	Quetiapine	2.64	(−0.65 to 5.93)	0.12
	Risperidone	1.14	(−0.84 to 3.12)	0.26
	Untreated	0.69	(−4.84 to 6.22)	0.81

Critera for Metabolic Syndrome in Children and Adolescents

Age group (years)	Obesity Waist Circumference‡		Triglycerides	HDL-C	Blood pressure	Fasting Plasma Glucose
6–<10	>=90th percentile	Plus two or more of the following	Metabolic Syndrome cannot be diagnosed in this age group, but additional testing may be warranted for patients with a family history of risk factors			
10–<16	>=90th percentile or adult cut-off whichever is lower		>=150 mg/dL	<40 mg/dL	Systolic >=130mmHg or Diastolic >=85mm Hg	>=100 mg/dL or T2DM
16+ (Adult criteria)	Male >= 90 cm* Female >=80 cm¥		>=150 mg/dL	Male <40 mg/dL Female <50 mg/dL	Systolic >=130mmHg or Diastolic >=85mm Hg	>=100 mg/dL
			Or Active Lipid Treatment		Or Active Treatment	Or T2DM

HDL-C, high-density lipoprotein cholesterol; T2DM, type 2 diabetes mellitus
*Male Europids >=94cm, Male Japanese >=85cm, ¥ Female Japanese >=90cm, ‡Tables for waist Circumference Percentiles for American children by age, gender, and ethnic backgroup available at: http://www.idf.org/webdata/docs/Mets_definition_children.pdf

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Patients without claims history demonstrating appropriate glucose monitoring:

Patient Info		Claims History	Provider Response
Patient DOB Member ID	Jane Doe 1/1/1995 ABC123	Annual Glucose Monitoring -No claims found	☐ Tested On ☐ Scheduled for ☐ Not my patient ☐ Testing unnecessary Explain: ☐ Other
Patient DOB Member ID	John Doe 1/1/2005 XYZ098	Annual Glucose Monitoring -Last test date: 2/1/2012	☐ Tested On ☐ Scheduled for ☐ Not my patient ☐ Testing unnecessary Explain: ☐ Other

Please indicate the status of this required laboratory work and fax this report within 30 days to DMAP at 503-947-2596.

Appendix B: Metabolic Monitoring Technical Specification

Indicator	Children Who Are Using Antipsychotic Medications Without Diabetes Screening
Eligible Population	
Inclusion	All enrolled Medicaid members under 18 years old at the time of a paid pharmacy claim for any antipsychotic (Table B1) with a service date during the reporting period AND a day supply greater than or equal to 5 days.
Reporting Period	35 days prior to the report date.
Exclusion	• Members with diabetes. There are two ways to identify members with diabetes: by pharmacy data and by claim/encounter data. The organization must use both methods to identify members with diabetes, but a member need only be identified by one method to be excluded from the measure. Members may be identified as having diabetes during the 24 months prior to the reporting date. a) Pharmacy data. Members who were dispensed insulin or oral hypoglycemics/ antihyperglycemics during the measurement year or year prior to the measurement year on an ambulatory basis. This include all agents in standard therapeutic class 58, excluding Metformin. Metformin can be used to mitigate weight gain associated with antipsychotic use and is not strictly an indicator of diabetes. b) Claim/encounter data. Members who had two face-to-face encounters in an outpatient setting or non-acute inpatient setting, on different dates of service, with a diagnosis of diabetes (Table B2), or one face-to-face encounter in an acute inpatient or ED setting, during the 24 months prior to the reporting date. Refer to Table B3 for codes to identify visit type.
Numerator	Patients without a glucose test (Table B4) or an HbA1c test (Table B5) performed within the 12 months prior to the report date.
Denominator	Eligible Population

OSU Oregon State University College of Pharmacy

Drug Use Research & Management Program

OHA Division of Medical Assistance Programs
500 Summer Street NE, E35; Salem, OR 97301-107
Phone 503-947-5220 | Fax 503-947-1119

DIVISION OF MEDICAL ASSISTANCE PROGRAMS
Policy & Planning Section
John A. Kitzhaber, MD, Governor

Oregon Health Authority
500 Summer Street NE, E35
Salem, Oregon 97301-1077
Voice: (503) 945-6513
Fax: (503) 947-1119

Antipsychotics
ARIPIPRAZOLE
ASENAPINE MALEATE
CHLORPROMAZINE HCL
CLOZAPINE
FLUPHENAZINE DECANOATE
FLUPHENAZINE HCL
HALOPERIDOL
HALOPERIDOL DECANOATE
HALOPERIDOL LACTATE
ILOPERIDONE
LOXAPINE SUCCINATE
LURASIDONE HCL
MOLINDONE HCL
OLANZAPINE
OLANZAPINE/FLUOXETINE HCL
PALIPERIDONE
PALIPERIDONE PALMITATE
PERPHENAZINE
PERPHENAZINE/AMITRIPTYLINE HCL
PIMOZIDE
PROCHLORPERAZINE EDISYLATE
PROCHLORPERAZINE MALEATE
QUETIAPINE FUMARATE
RISPERIDONE
RISPERIDONE MICROSPHERES
THIORIDAZINE HCL
THIOTHIXENE
TRIFLUOPERAZINE HCL
ZIPRASIDONE HCL

Table B1 Antipsychotics

Description	ICD-9-CM Diagnosis
Diabetes	250, 357.2, 362.0, 366.41, 648.0

Table B2 Codes to Identify Diabetes[16]

Description	CPT	UB Revenue
Outpatient	99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99384-99387, 99394-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456	051x, 0520-0523, 0526-0529, 057x-059x, 082x-085x, 088x, 0982, 0983
Nonacute inpatient	99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337	0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient	99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99291	010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x,021x, 072x, 080x, 0987
ED	99281-99285	045x, 0981

Table B3: Codes to Identify Visit Type[16]

Description	CPT	LOINC
Glucose test	80047, 80048, 80050, 80053, 80069, 82947, 82950, 82951	1518-0, 1554-5, 10450-5, 14995-5, 17865-7

Table B4 Codes to Identify Diabetes Screening[16]

CPT	CPT Category II	LOINC
83036, 83037	3044F, 3045F, 3046F	4548-4, 4549-2, 17856-6, 59261-8, 62388-4

Table B5 Codes to Identify HbA1c Tests[16]