



Supplemental Information

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Daniels SR; Greer FR; Committee on Nutrition. Lipid screening and cardiovascular health in childhood. *Pediatrics*. 2008;122(1):198–208.

Table numbers are from the original publication.

Author	Journal	Year	Citation	Title	Evid Level based on AAP Classification Statement	Category of article			Social issues
						Medical trx	Non-medical trx	Provider behavior	
Anderson K, Dean H	Beta release	1990	(Dec) 14(4):105-106	The effect of diet and exercise on a native youth with poorly controlled NIDDM	D		d		
Freund A, Johnson SB, Silverstein J, Thomas J	Health Psychol	1991	10(3):200-208	Assessing daily management of childhood diabetes using 24-hour recall interviews: reliability and stability	C				C
Kawahara R, Amemiya T, Yoshino M, et al	Diabetes Research & Clin Practice	1994	24:181-185	Dropout of young NID diabetics from diabetic care	C				C
Greenfield S, Rogers W, Mangotich M, et al	JAMA	1995	274(18):1436-1444	Outcomes of patients with hypertension and NIDDM treated by different systems and specialties	C			c	
Glaser N, Jones KL	Advances in Pediatrics	1996	43:359-396	NIDDM in children and adolescents	D	d			
Pinhas-Hamiel O, Zeitler P	Diabetes Spectrum	1997	10(4):292-298	A weighty problem - diagnosis and treatment of T2D in adolescents	D	d			
Owada M, Nitadori Y, Kitagawa T	Clin Pediatrics	1998	37:117-122	Treatment of NIDDM in Youth	D	d			
Dabela D, Pettitt DJ, Jones KL, Arslanian SA	Endocrinology and Metabolism Clinics	1999	(Dec) 28(4):709-729	T2DM in minority children and adolescents: an emerging problem	D	d			
Dean H	Paediatr Child Health	1999	May/June 4(4):265-270	Treatment of T2D in youth: an argument for RCT	D	d			
Pinhas-Hamiel O, Standiford D, Hamiel D, et al	Arch Ped & Adolesc Med	1999	153:1063-1067	The Type 2 Family: A setting for development and treatment of Adolescent T2DM	C				C
Amer Diabetes Assoc	Pediatrics	2000	(Mar) 105(3):671-680	T2D in children and adolescents	D	d			
Jones KL, Haghi M	The Endocrinologist	2000	10:389-396	T2DM in children and adolescence: a primer	D	d			
Ponder SW, Sullivan S, McBeth G	Diabetes Spectrum	2000	13(2):95-119	T2DM in teens	D	d			
Silverstein JH, Rosenbloom AL	J Pediatr Endocrinol Metab	2000	13:1403-1409	Treatment of T2DM diabetes mellitus in children and adoles	C			c	
Ludwig DS, Ebbeling CB	JAMA	2001	(Sep 26) 286(12):1427-1430	T2DM in children: primary care and public health considerations	D	d			
Bradshaw B	J Ped Endocrin & Metabol	2002	15:547-551	The role of the family in managing therapy in minority children with T2DM	C				C
Jones KL, Arslanian S, Peterokova VA, Park JS, Tomlinson M	Diabetes Care	2002	(Jan)25(1):89-94	Effect of metformin in pediatric patients with T2D	A	a			
Kaufman FR	J Pediatr Endocrinol Metab	2002	15:737-744	T2DM in children and youth: a new epidemic	D	d			
Zuhri-Yafi MI, Brosnan PG, Hardin DS	J Pediatr Endocrinol Metab	2002	15:541-546	Treatment of T2DM diabetes mellitus in children and adoles	C	c			
Amer Diabetes Assoc	Diabetes Care	2003	(Jul) 26(7):2194-2197	Management of dyslipidemia in children and adolescents with diabetes	D	d			

Continued	Author	Journal	Year	Citation	Title	Category of article				
						Evid Level based on AAP Classification Statement	Medical trx	Non-medical trx	Provider behavior	Social issues
	Ditmyer MM, Price JH, Telljohann SK, Rogalski F	Arch Ped & Adolesc Med	2003	(Sep) 157:913-918	Pediatricians' perceptions and practices regarding prevention and treatment of T2DM in children and adolescents	D			d	
	Ebbeling CB, Leidig MM, Sinclair KB et al	Arch Ped & Adolesc Med	2003	(Aug) 157:773-779	A reduced-glycemic load diet in the treatment of adolescent obesity	A		a		
	Grinstein G, Muzumdar R, Aponte L, et al	Horm Res	2003	60:121-126	Presentation and 5-year follow-up of T2DM in african american and caribbean hispanic adolescents	C	c			
	Kaufman FR	Reviews in Endocrine & Metabolic Disorders	2003	4:33-42	T2D in children and youth	D	d			
	Phillips M, Givens C, Schreiner B	Diabetes Educator	2002	(May-Jun) 28(3):400-402	Impact of a multidisciplinary education program for children and adolescents with T2D	C		c		
	Pinhas-Hamiel, O; Zeitler P.	Pediatric Diabetes	2003	4:24-28	Barriers to the treatment of adolescent T2D — a survey of provider perceptions	C			c	
	Berardis, Pellegrini, Franciosi, et al	Diabetes Care	2004	Feb; 27(2):398-406	Quality of care and outcomes in T2D Patients	C				c
	Daaboul JJ, Silverstein JH	Minerva Pediatr	2004	56(3):255-61	the management of T2D in children and adolescents	D	d			
	Kadmon, PM; Gruppoco, PA	J Ped Endocrinol & Metabol	2004	17:1184-93	Glycemic control w/metformin or insulin therapy in adolescents w/T2DM	C	c			
	Sellers EAC, Dean HJ	J Pediatr Endocrinol Metab	2004	17(11):1561-1564	short-term insulin therapy in adolescents with T2DM	A	a			
	Willi SM, Martin K, Datko FM, Brant BP	Diabetes Care	2004	27(2):348-353	Treatment of T2D in childhood using a very-low-calorie diet	B		b		
	Corrales-Yaucooes KM, Higgins LA	Pediatric Annals	2005	(Sep) 34(9):701-709	Nutritional management of othe overweight child w/T2D	D		d		
	Dabiri G, Jones K, Krebs J, et al	65th Scientific Sessions, ADA	2005	June 10-14, San Diego, CA; abstract 1904-P	Benefits of rosiglitazone in children w/T2DM	A	a			
	Gungor N, Hammon T, Libman I, et al	Ped Clin NA	2005	52:1579-1609	T2DM in youth: the complete picture to date	D	d			
	Hannon TS, Rao G, Arslanian SA	Pediatrics	2005	(Aug) 116(2):473-480	Childhood obesity and T2DM	D	d			
	Jacobsen-Dickman E, Levitsky L	Ped Clin NA	2005	52:1689-1703	Oral agents in managing DM in children and adolescents	D	d			
	Loghmani ES	Cur Diabetes Rep	2005	5:385-390	Nutrition therapy for overweight children and adolescents w/T2D	D		d		
	Miller JL, Silverstein JH	J Pediatr Endocrinol Metab	2005	18:111-123	the management of T2D in children and adolescents	D	d			
	Pinhas-Hamiel, O; Zeitler P.	Advances in Pediatrics	2005	52:223-259	Advances in epidemiology and treatment of T2D in childreng	D	d			

Author	Journal	Year	Citation	Title	Category of article				
					Evid Level based on AAP Classification Statement	Medical trx	Non-medical trx	Provider behavior	Social issues
Ziener, Miller; Rhee, Doyle, Watkins et al	The Diabetes Educator	2005	(Jul/Aug);31(4):564-571	Clinical inertia contributes to poor diabetes control in a primary care setting	C			c	
Berry D, Urban A, Grey M	J Pediatr Health Care	2006	20(2):88-97	Management of Type 2 diabetes in Youth (Part 2)	D		d		
Cara JF, Chaiken RL	Cur Diabetes Rep	2006	6:241-250	T2D and the metabolic syndrome in children and adolescents	D		d		
Miller JL, Silverstein JH	Treat Endocrinol	2006	5(4):201-210	The treatment of T2DM in Youth. Which Therapies?	D		d		
Mulvaney SA, Schlundt DG, Mudasingu E, et al	Diabetes Care	2006	(May) 29(5):993-997	Parent perceptions of caring for Adolescents with T2D	D				d
Ziener, Tsui, Caudle, Barnes et al	AMIA 2006 symposium proceedings	2006	pg 1160	An informatics-supported intervention improves diabetes control in a primary care setting	C			c	
Gottschalk M, Danne T, Vrajnic A, Cara JF	Diabetes Care	2007	(Apr) 30(4):790-794	Glimepiride vs. metformin as monotherapy in pediatric patients w/T2D	A		a		
Libman IM; Arslanian, SA	Horm Res	2007	67:22-34	Prevention & Treatment of T2DM in youth	D		d		
McGavock J, Sellers E, Dean H	Diabetes Vasc Dis Res	2007	4:305-310	Physical activity for the prevention and management of youth-onset T2DM: focus on cardiovascular complications	C			c	
Pinhas-Hamiel, O; Zeitler P.	Pediatric Diabetes	2007	8(suppl 9):16-27	Clinical presentation and treatment of T2D in children	D		d		
Reinehr T, Schober E, Roth CL, et al	Horm Res	2008	69:107-113	T2D in children and adolescents in a 2 yr follow-up: insufficient adherence to diabetes centers	C				c
Rothman RL, Mulvaney S, Elasy TA, et al	Pediatrics	2008	(Apr) 121(4):e912-e919	Self-Management Behaviors, racial disparities, and glycemic control among adolescents with Type 2 D	D				d
Skinner AC, Weinberger M, Mulvaney S, et al	Diabetes Care	2008	(Feb) 31(2):227-229	Accuracy of perceptions of overweight and relation to self-care behaviors among adolescents with T2D and their parents	D				d
Yu BS, Wang AR	World J of Pediatr	2008	(Feb 15) 4(1):8-13	Glucagon-like peptide 1 based therapy for T2D	D		d		
Mulvaney SA, Mudasingu E, Schlundt DG, et al	Diabetes Educator	2008	(July/Aug) 34(4):674-682	Self-Management in Type 2 Diabetes: The Adolescent Perspective	C				c
Inge, TH, Miyano, G; Bean, J, et al	Pediatrics	2009	123(1):214-222.	Reversal of type 2 diabetes mellitus and improvements in cardiovascular risk factors after surgical weight loss in adolescents	C		c		

Continued

Author	Journal	Year	Citation	Title	Category of article				
					Evid Level based on AAP Classification Statement	Medical trx	Non-medical trx	Provider behavior	Social issues
McCarty RL, Weber WJ, Loots B, et al	J Alternat and Complement Med	2010	16(2):165-173	Complementary and alternative medicine use and quality of life in pediatric diabetes	C		c		
Wong, K; Potter, A; Mulvaney, S, et al	Diabetes Care	2010	(Mar) 33(3):512-514	Pediatric endocrinologists' management of children with type 2 diabetes	C				c
Habab AM, George ET, Mathew V, et al	Ann Saudi Med	2011	(Mar-Apr) 31(2):190-193	Response to oral gliclazide in a pre-pubertal child with hepatic nuclear factor-1 alpha maturity onset diabetes of the young.	D	d			

Supplemental Information C. Key Action Statements displayed as production rules

Eligibility Criteria	
Inclusion criteria	Patients ≥ 10 but < 18 years of age with T2DM
Exclusion criteria	Patients with impaired glucose tolerance
	OR Isolated insulin resistance
	OR Prediabetes
	OR Diabetes in pregnancy, including diabetes in pregnant adolescents

Key Action Statement		Logic	Strength of Recommendation
Key action statement 1A	IF	Children and adolescents with T2DM	Strong recommendation
	AND	Ketotic	
	OR	In diabetic ketoacidosis	
Key action statement 1B	THEN	Ensure that insulin therapy is initiated	Strong recommendation
	IF	Venous or plasma BG concentrations > 250 mg/dL	
	OR	HbA1c $> 9\%$	
	OR	Distinction between T1DM and T2DM is unclear	
Key action statement 2	THEN	Initiate insulin therapy	Recommendation
	IF	Not ketotic	
	AND	Not in diabetic ketoacidosis	
	AND	Venous or plasma BG concentrations < 250 mg/dL	
	AND	HbA1c $\leq 9\%$	
	AND	Diagnosis of T2DM is clear	
Key action statement 3A	THEN	Start metformin as first-line therapy for children and adolescents at the time of diagnosis	Option
	AND	Initiate a lifestyle-modification program including nutrition and physical activity	
	IF	Treatment goals for BG concentrations are not being met	
Key action statement 3B	OR	Treatment goals for HbA1c concentrations are not being met	Option
	THEN	Intensify treatment	
Key action statement 4	IF	Eligibility criteria	Option
	THEN	Monitor HbA1c levels every 3 mo	
Key action statement 5	IF	Taking insulin or other medications with a risk of hypoglycemia	Option
	OR	Are initiating or changing their diabetes treatment regimen	
	OR	Have not met treatment goals	
	OR	Have intercurrent illnesses	
	THEN	Recommend finger-stick BG concentrations be monitored	
Key action statement 6	IF	Eligibility criteria	Option
	THEN	Incorporate the American Dietetic Association's Pediatric Weight Management Evidence-Based Nutrition Practice Guidelines in the nutrition counseling of patients with T2DM	
Key action statement 6	IF	Eligibility criteria	Option
	THEN	Encourage children and adolescents with T2DM to engage in daily moderate to vigorous exercise for at least 60 min	
	AND	Encourage children and adolescents with T2DM to limit nonacademic screen time to < 2 h/d	

Supplemental Information D. QDS Listing of Decision Variables and Actions

Key action statements	1a, 2	1b, 2, 3a	1b, 2, 3a	1b, 2, 3a	1a, 2	All except 1b	All
Quality data element name	Ketonia	Plasma glucose	HbA1c	Diabetic ketoacidosis	Diabetes	Age	
Quality data type	Laboratory test result	Laboratory test result	Laboratory test result	Active diagnosis	Active diagnosis	Patient characteristic	
Code set	LOINC	LOINC	LOINC	SNOMED CT	SNOMED CT	SNOMED CT	
Code list	22702-5	14749-6	55454-3	111556005	44054006	424144002	
Standard element name	Ketones in urine test strip	Glucose serum/plasma	HbA1c in blood	Diabetic ketoacidosis without coma	T2DM	Current chronologic age	
Key action statements	All	All	All	All	1b	1a	
Quality data element name	Impaired glucose tolerance	Insulin resistance	Prediabetes	Gestational diabetes	Diabetes	Consultation	
Quality data type	Active diagnosis	Active diagnosis	Active diagnosis	Active diagnosis	Conclude	Communication provider to provider	
Code set	SNOMED CT	SNOMED CT	SNOMED CT	SNOMED CT	SNOMED CT	SNOMED CT	
Code list	9414007	237650006	161641009	11687002	282292002	129826008	
Standard element name	Impaired glucose tolerance	Insulin resistance	At risk for diabetes mellitus	Gestational diabetes	Uncertain diagnosis	Finding related to therapeutic regimen management	
Key action statements	1, 2, 6	2, 3a, 4	2	3a, 4	3b	4	
Quality data element name	Insulin	Metformin	Lifestyle modification	Treatment goal	HbA1c	Changed regimen	
Quality data type	Medication ordered	Medication ordered	Communication to patient	Care goal	Laboratory test ordered	Procedure ordered	
Code set	RxNorm	RxNorm	SNOMED CT	SNOMED CT	LOINC	SNOMED CT	
Code list	311033	428759	313204009	3890801001	55454-3	55053003	
Standard element name	Insulin	Metformin	Lifestyle education	Goal not achieved	HbA1C in blood	Prescription of therapeutic regimen	
Key action statements	4	4	5	6	6		
Quality data element name	Intercurrent illness	Finger-stick glucose	Weight counseling	Exercise education	Behavior education		
Quality data type	Active diagnosis	Communication to patient	Communication to patient	Communication to patient	Communication to patient		
Code set	SNOMED CT	SNOMED CT	SNOMED CT	SNOMED CT	SNOMED CT		
Code list	88472004	398773005	410200000	304507003	304671008		
Standard element name	Intercurrent disease	Diabetes self-monitoring health education	Weight control education	Exercise education	Discussion about behavior		

CES-D, NIMH. Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	During the Past				
	Week	Rarely or none of the time (<1 d)	Some or a little of the time (1–2 d)	Occasionally or a moderate of time (3–4 d)	Most or all of the time (5–7 d)
1. I was bothered by things that usually don't bother me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I did not feel like eating; my appetite was poor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I felt that I could not shake off the blues even with help from my family or friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I felt I was just as good as other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I had trouble keeping my mind on what I was doing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I felt depressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I felt that everything I did was an effort.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I felt hopeful about the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I thought my life had been a failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I felt fearful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My sleep was restless.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I was happy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I talked less than usual.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I felt lonely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. People were unfriendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I enjoyed life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I had crying spells.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I felt sad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I felt that people dislike me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I could not get "going."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Scoring: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, and 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is 0 to 60, with the higher scores indicating the presence of more symptoms.

Supplemental Information H. Hypertension Screening Tool: The National Heart, Lung and Blood Institute Hypertension Guidelines

BP Levels for Boys by Age and Height Percentile															
Age (Year)	BP Percentile	Systolic BP (mm Hg)							Diastolic BP (mm Hg)						
		Percentile of Height							Percentile of Height						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
1	50th	80	81	83	85	87	88	89	34	35	36	37	38	39	39
	90th	94	95	97	99	100	102	103	49	50	51	52	53	53	54
	95th	98	99	101	103	104	106	106	54	54	55	56	57	58	58
	99th	105	106	108	110	112	113	114	61	62	63	64	65	66	66
2	50th	84	85	87	88	90	92	92	39	40	41	42	43	44	44
	90th	97	99	100	102	104	105	106	54	55	56	57	58	58	59
	95th	101	102	104	106	108	109	110	59	59	60	61	62	63	63
	99th	109	110	111	113	115	117	117	66	67	68	69	70	71	71
3	50th	86	87	89	91	93	94	95	44	44	45	46	47	48	48
	90th	100	101	103	105	107	108	109	59	59	60	61	62	63	63
	95th	104	105	107	109	110	112	113	63	63	64	65	66	67	67
	99th	111	112	114	116	118	119	120	71	71	72	73	74	75	75
4	50th	88	89	91	93	95	96	97	47	48	49	50	51	51	52
	90th	102	103	105	107	109	110	111	62	63	64	65	66	66	67
	95th	106	107	109	111	112	114	115	66	67	68	69	70	71	71
	99th	113	114	116	118	120	121	122	74	75	76	77	78	78	79
5	50th	90	91	93	95	96	98	98	50	51	52	53	54	55	55
	90th	104	105	106	108	110	111	112	65	66	67	68	69	69	70
	95th	108	109	110	112	114	115	116	69	70	71	72	73	74	74
	99th	115	116	118	120	121	123	123	77	78	79	80	81	81	82
6	50th	91	92	94	96	98	99	100	53	53	54	55	56	57	57
	90th	105	106	108	110	111	113	113	68	68	69	70	71	72	72
	95th	109	110	112	114	115	117	117	72	72	73	74	75	76	76
	99th	116	117	119	121	123	124	125	80	80	81	82	83	84	84

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BP Levels for Boys by Age and Height Percentile

Age (Year)	BP Percentile	Systolic BP (mm Hg)														Diastolic BP (mm Hg)							
		Percentile of Height								Percentile of Height								Percentile of Height					
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th	
7	50th	92	94	95	97	99	100	101	55	55	56	57	58	59	59								
	90th	106	107	109	111	113	114	115	70	70	71	72	73	74	74								
	95th	110	111	113	115	117	118	119	74	74	75	76	77	78	78								
	99th	117	118	120	122	124	125	126	82	82	83	84	85	86	86								
8	50th	94	95	97	99	100	102	102	56	57	58	59	60	60	61								
	90th	107	109	110	112	114	115	116	71	72	72	73	74	75	76								
	95th	111	112	114	116	118	119	120	75	76	77	78	79	79	80								
	99th	119	120	122	123	125	127	127	83	84	85	86	87	87	88								
9	50th	95	96	98	100	102	103	104	57	58	59	60	61	61	62								
	90th	109	110	112	114	115	117	118	72	73	74	75	76	76	77								
	95th	113	114	116	118	119	121	121	76	77	78	79	80	81	81								
	99th	120	121	123	125	127	128	129	84	85	86	87	88	88	89								
10	50th	97	98	100	102	103	105	106	58	59	60	61	61	62	63								
	90th	111	112	114	115	117	119	119	73	73	74	75	76	77	78								
	95th	115	116	117	119	121	122	123	77	78	79	80	81	81	82								
	99th	122	123	125	127	128	130	130	85	86	86	88	88	89	90								
11	50th	99	100	102	104	105	107	107	59	59	60	61	62	63	63								
	90th	113	114	115	117	119	120	121	74	74	75	76	77	78	78								
	95th	117	118	119	121	123	124	125	78	78	79	80	81	82	82								
	99th	124	125	127	129	130	132	132	86	86	87	88	89	90	90								
12	50th	101	102	104	106	108	109	110	59	60	61	62	63	63	64								
	90th	115	116	118	120	121	123	123	74	75	75	76	77	78	79								
	95th	119	120	122	123	125	127	127	78	79	80	81	82	82	83								
	99th	126	127	129	131	133	134	135	86	87	88	89	90	90	91								
13	50th	104	105	106	108	110	111	112	60	60	61	62	63	64	64								
	90th	117	118	120	122	124	125	126	75	75	76	77	78	79	79								
	95th	121	122	124	126	128	129	130	79	79	80	81	82	83	83								
	99th	128	130	131	133	135	136	137	87	87	88	89	90	91	91								
14	50th	106	107	109	111	113	114	115	60	61	62	63	64	65	65								
	90th	120	121	123	125	126	128	128	75	76	77	78	79	79	80								
	95th	124	125	127	128	130	132	132	80	80	81	82	83	84	84								
	99th	131	132	134	136	138	139	140	87	88	89	90	91	92	92								
15	50th	109	110	112	113	115	117	117	61	62	63	64	65	66	66								
	90th	122	124	125	127	129	130	131	76	77	78	79	80	80	81								
	95th	126	127	129	131	133	134	135	81	81	82	83	84	85	85								
	99th	134	135	136	138	140	142	142	88	89	90	91	92	93	93								
16	50th	111	112	114	116	118	119	120	63	63	64	65	66	67	67								
	90th	125	126	128	130	131	133	134	78	78	79	80	81	82	82								
	95th	129	130	132	134	135	137	137	82	83	83	84	85	86	87								
	99th	136	137	139	141	143	144	145	90	90	91	92	93	94	94								
17	50th	114	115	116	118	120	121	122	65	66	66	67	68	69	70								
	90th	127	128	130	132	134	135	136	80	80	81	82	83	84	84								
	95th	131	132	134	136	138	139	140	84	85	86	87	87	88	89								
	99th	139	140	141	143	145	146	147	92	93	93	94	95	96	97								

BP, blood pressure.

*The 90th percentile is 1.28 SDs, the 95th percentile is 1.645 SDs, and the 99th percentile is 2.326 SDs over the mean.

For research purposes, the SDs in Appendix Table B allow computation of BP z scores and percentiles for boys with height percentiles given in Table 2 (ie, the fifth, 10th, 25th, 50th, 75th, 90th, and 95th percentiles). These height percentiles must be converted to height z scores given by 5% = -1.0645; 10% = -1.28; 25% = -0.68; 50% = 0; 75% = 0.68; 90% = 1.28; 95% = 1.645 and then computed according to the methods in steps described in Appendix B. For children with height percentiles other than these, follow steps as described in Appendix B.

BP Levels for Girls by Age and Height Percentile

Age, Year	BP Percentile	Systolic BP (mm Hg)								Diastolic BP (mm Hg)					
		Percentile of Height								Percentile of Height					
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
1	50th	83	84	85	86	88	89	90	38	39	39	40	41	41	42
	90th	97	97	98	100	101	102	103	52	53	53	54	55	55	56
	95th	100	101	102	104	105	106	107	56	57	57	58	59	59	60
	99th	108	108	109	111	112	113	114	64	64	65	65	66	67	67
2	50th	85	85	87	88	89	91	91	43	44	44	45	46	46	47
	90th	98	99	100	101	103	104	105	57	58	58	59	60	61	61
	95th	102	103	104	105	107	108	109	61	62	62	63	64	65	65
	99th	109	110	111	112	114	115	116	69	69	70	70	71	72	72
3	50th	86	87	88	89	91	92	93	47	48	48	49	50	50	51
	90th	100	100	102	103	104	106	106	61	62	62	63	64	64	65
	95th	104	104	105	107	108	109	110	65	66	66	67	68	68	69
	99th	111	111	113	114	115	116	117	73	73	74	74	75	76	76
4	50th	88	88	90	91	92	94	94	50	50	51	52	52	53	54
	90th	101	102	103	104	106	107	108	64	64	65	66	67	67	68
	95th	105	106	107	108	110	111	112	68	68	69	70	71	71	72
	99th	112	113	114	115	117	118	119	76	76	76	77	78	79	79
5	50th	89	90	91	93	94	95	96	52	53	53	54	55	55	56
	90th	103	103	105	106	107	109	109	66	67	67	68	69	69	70
	95th	107	107	108	110	111	112	113	70	71	71	72	73	73	74
	99th	114	114	116	117	118	120	120	78	78	79	79	80	81	81
6	50th	91	92	93	94	96	97	98	54	54	55	56	56	57	58
	90th	104	105	106	108	109	110	111	68	68	69	70	70	71	72
	95th	108	109	110	111	113	114	115	72	72	73	74	74	75	76
	99th	115	116	117	119	120	121	122	80	80	80	81	82	83	83
7	50th	93	93	95	96	97	99	99	55	56	56	57	58	58	59
	90th	106	107	108	109	111	112	113	69	70	70	71	72	72	73
	95th	110	111	112	113	115	116	116	73	74	74	75	76	76	77
	99th	117	118	119	120	122	123	124	81	81	82	82	83	84	84
8	50th	95	95	96	98	99	100	101	57	57	57	58	59	60	60
	90th	108	109	110	111	113	114	114	71	71	71	72	73	74	74
	95th	112	112	114	115	116	118	118	75	75	75	76	77	78	78
	99th	119	120	121	122	123	125	125	82	82	83	83	84	85	86
9	50th	96	97	98	100	101	102	103	58	58	58	59	60	61	61
	90th	110	110	112	113	114	116	116	72	72	72	73	74	75	75
	95th	114	114	115	117	118	119	120	76	76	76	77	78	79	79
	99th	125	125	126	128	129	130	131	85	85	86	87	87	88	89
11	50th	100	101	102	103	105	106	107	60	60	60	61	62	63	63
	90th	114	114	116	117	118	119	120	74	74	74	75	76	77	77
	95th	118	118	119	121	122	123	124	78	78	78	79	80	81	81
	99th	125	125	126	128	129	130	131	85	85	86	87	87	88	89
12	50th	102	103	104	105	107	108	109	61	61	61	62	63	64	64
	90th	116	116	117	119	120	121	122	75	75	75	76	77	78	78
	95th	119	120	121	123	124	125	126	79	79	79	80	81	82	82
	99th	127	127	128	130	131	132	133	86	86	87	88	88	89	90
13	50th	104	105	106	107	109	110	110	62	62	62	63	64	65	65
	90th	117	118	119	121	122	123	124	76	76	76	77	78	79	79
	95th	121	122	123	124	126	127	128	80	80	80	81	82	83	83
	99th	128	129	130	132	133	134	135	87	87	88	89	89	90	91
14	50th	106	106	107	109	110	111	112	63	63	63	64	65	66	66
	90th	119	120	121	122	124	125	125	77	77	77	78	79	80	80
	95th	123	123	125	126	127	129	129	81	81	81	82	83	84	84
	99th	130	131	132	133	135	136	136	88	89	89	90	90	91	92
15	50th	107	108	109	110	111	113	113	64	64	64	65	66	67	67
	90th	120	121	122	123	125	126	127	78	78	78	79	80	81	81
	95th	124	125	126	127	129	130	131	82	82	82	83	84	85	85
	99th	131	132	133	134	136	137	138	89	89	90	91	91	92	93
16	50th	108	108	110	111	112	114	114	64	64	65	66	66	67	68

Continued

BP Levels for Girls by Age and Height Percentile															
Age, Year	BP Percentile	Systolic BP (mm Hg)								Diastolic BP (mm Hg)					
		Percentile of Height								Percentile of Height					
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
17	90th	121	122	123	124	126	127	128	78	78	79	80	81	81	82
	95th	125	126	127	128	130	131	132	82	82	83	84	85	85	86
	99th	132	133	134	135	137	138	139	90	90	90	91	92	93	93
	50th	108	109	110	111	113	114	115	64	65	65	66	67	67	68
	90th	122	122	123	125	126	127	128	78	79	79	80	81	81	82
	95th	125	126	127	128	130	131	132	82	83	83	84	85	85	86
	99th	133	133	134	136	137	138	139	90	90	91	91	92	93	93

BP, blood pressure.

* The 90th percentile is 1.28 SDs, the 95th percentile is 1.645 SDs, and the 99th percentile is 2.326 SDs over the mean.

For research purposes, the SD in Appendix Table B allow computation of BP z scores and percentiles for girls with height percentiles given in Table 4 (ie, the fifth, 10th, 25th, 50th, 75th, 90th, and 95th percentiles). These height percentiles must be converted to height Z-scores given by (5% = -1.645; 10% = -1.28; 25% = -0.68; 50% = 0; 75% = 0.68; 90% = 1.28; 95% = 1.645) and then computed according to the methodology in steps 2–4 described in Appendix B. For children with height percentiles other than these, follow steps 1–4 as described in Appendix B.

TABLE 1 Cut Points for Total Cholesterol and LDL Concentrations in Children and Adolescents

Category	Percentile	Total Cholesterol, mg/dL	LDL, mg/dL
Acceptable	<75th	<170	<110
Borderline	75th–95th	170–199	110–129
Elevated	>95th	>200	>130

Adapted from American Academy of Pediatrics. National Cholesterol Education Program: report of the expert panel on blood cholesterol levels in children and adolescents. *Pediatrics*. 1992;89 (3 pt 2):525–584.

TABLE 2 Lipid and Lipoprotein Distributions in Subjects Aged 5 to 19 Years

Variable	Males			Females		
	5–9 y	10–14 y	15–19 y	5–9 y	10–14 y	15–19 y
Total cholesterol, mg/dL						
50th percentile	153	161	152	164	159	157
75th percentile	168	173	168	177	171	176
90th percentile	183	191	183	189	191	198
95th percentile	186	201	191	197	205	208
Triglyceride, mg/dL						
50th percentile	48	58	68	57	68	64
75th percentile	58	74	88	74	85	85
90th percentile	70	94	125	103	104	112
95th percentile	85	111	143	120	120	126
LDL, mg/dL						
50th percentile	90	94	93	98	94	93
75th percentile	103	109	109	115	110	110
90th percentile	117	123	123	125	126	129
95th percentile	129	133	130	140	136	137
HDL, mg/dL						
5th percentile	38	37	30	36	36	37
10th percentile	43	40	34	38	40	38
25th percentile	49	46	39	48	45	43
50th percentile	55	55	46	52	52	51

HDL, high-density lipoprotein.

Adapted from Tamir I, Heiss G, Glueck CJ, Christensen B, Kwiterovich P, Rifkind B. Lipid and lipoprotein distributions in white children ages 6–19 y: the Lipid Research Clinics Program Prevalence Study. *J Chronic Dis*. 1981;34(1):27–39.

TABLE 5 Recommended LDL Concentrations for Pharmacologic Treatment of Children and Adolescents Aged ≥ 10 Years

Patient Characteristics	Recommended Cut Points
No other risk factors for CVD	LDL concentration is persistently >190 mg/dL despite diet therapy
Other risk factors present, including obesity, hypertension, or cigarette smoking or positive family history of premature CVD	LDL concentration is persistently >160 mg/dL despite diet therapy
Children with diabetes mellitus	Pharmacologic treatment should be considered when LDL concentration is ≥ 130 mg/dL

American Academy of Pediatrics. National Cholesterol Education Program: report of the expert panel on blood cholesterol levels in children and adolescents. *Pediatrics*. 1992;89(3 pt 2):525–584; Kavey RE, Allada V, Daniels SR, et al; American Heart Association Expert Panel on Population and Prevention Science; American Heart Association Council on Cardiovascular Disease in the Young; American Heart Association Council on Epidemiology and Prevention; American Heart Association Council on Nutrition, Physical Activity and Metabolism; American Heart Association Council on High Blood Pressure Research; American Heart Association Council on Cardiovascular Nursing; American Heart Association Council on the Kidney in Heart Disease; Interdisciplinary Working Group on Quality of Care and Outcomes Research. Cardiovascular risk reduction in high-risk pediatric patients: a scientific statement from the American Heart Association Expert Panel on Population and Prevention Science; the Councils on Cardiovascular Disease in the Young, Epidemiology and Prevention, Nutrition, Physical Activity and Metabolism, High Blood Pressure Research, Cardiovascular Nursing, and the Kidney in Heart Disease; and the Interdisciplinary Working Group on Quality of Care and Outcomes Research: endorsed by the American Academy of Pediatrics. *Circulation*. 2006;114(24):2710–2738.