

CVD, Diabetes and NAS Laboratory Screening Assessments to Consider in Primary Care Setting

Age	BMI category	Lipids	NASH	Diabetes
2-8 years	BMI >5-<85%	No routine screening, unless CV risk factors*	No	No
	BMI ≥ 85-95%			Generally no, unless onset of puberty
	BMI ≥ 95%			Yes: Fasting Lipid Panel x2 (average results)
9-11 years	BMI >5-<85%	Universal Screening:** Fasting lipid panel or Non-fasting lipid panel (calculate non-HDL)	No	No
	BMI ≥ 85-95%		Yes, if CV or Diabetes Risk Factors: AST/ALT	Yes, if 2 diabetes risk factors: Fasting glucose and/or Hgb A1C (≥10 years or onset of puberty)‡
	BMI ≥ 95%		Yes: AST/ALT	
12-16 years	BMI >5-<85%	No: Unless risk factors	No	No
	BMI ≥ 85-95%	Yes: Fasting Lipid Panel x2 (average results)	Yes, if CV or Diabetes Risk Factors: AST/ALT	Yes, if 2 diabetes risk factors: Fasting glucose and/or Hgb A1C ‡
	BMI ≥ 95%		Yes: AST/ALT	
17-21 years	BMI >5-<85%	Universal Screening once during time period:** Fasting lipid panel or Non-fasting lipid panel (calculate non-HDL)	No	No
	BMI ≥ 85-95%		Yes, if CV or Diabetes Risk Factors: AST/ALT	Yes, if 2 diabetes risk factors: Fasting glucose and/or Hgb A1C ‡
	BMI ≥ 95%		Yes: AST/ALT	

***CV Risk Factors:** Parent, grandparent, aunt/uncle or sibling with premature CV disease (≤ 55 years for men, ≤ 65 years for women), Parent with total cholesterol ≥ 240 or known dyslipidemia; or child with HTN, tobacco use, or diabetes

** **Universal Screening of lipids:** Fasting Lipid Panel (If abnormal repeat 2 weeks to 3 months later and average); OR Non-Fasting Lipid Panel (Calculate non-HDL cholesterol = Total cholesterol-HDL cholesterol; if Non-HDL ≥ 145 mg/dl or HDL < 40 mg/dl- obtain fasting lipid panel twice and average)

*** **Diabetes Risk Factors:** FHx: of type 2 diabetes, race/ethnicity (Native American, African American, Latino, Asian American, Pacific Islander), signs of insulin resistance (acanthosis nigricans, HTN, dyslipidemia, Polycystic ovarian disease, or small for gestational weight birth weight), or maternal history of diabetes or GDM during child's gestation

† **Note:** there are no clear recommendations from pediatric hepatologists concerning NASH screening. Clinicians could consider screening at risk children at 10 years old¹ given increased prevalence of fatty liver⁶ but clinicians may want to consider screening overweight and obese children at younger ages in certain high risk populations (e.g. obese Latino and Asian children).

‡HgbA1C may offer an alternative test to fasting glucose for non-fasting patients, however, it's accuracy as a screening test for children and adolescents is not clear.⁸⁻⁹ A 2 hour GTT > 200 mg/dl can also identify diabetes or pre-diabetes.

Guidelines Adapted from and References

1. Barlow, et al. Expert Committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*. 2007. 120(Suppl 4) S164-S192
2. Krebs et al. Assessment of Child and Adolescent Overweight and Obesity. *Pediatrics*. 2007.120(S4)S193-S228;
3. Daniels, S. et al Lipid Screening and Cardiovascular Health in Childhood. *Pediatrics*. 2008. 122:198-208
4. ADA Consensus Statement. Type 2 diabetes in children and adolescents. *Diabetes Care*. 2000 23(3) 381-380
5. ADA Position Statement. Standards of medical care in diabetes-2010. *Diabetes Care*. 2010. 33(Suppl1) S11-S61
6. Schwimmer, J. et al. Prevalence of Fatty Liver in Children and Adolescents.. *Pediatrics*, 2006. 118(4) 1388-1393
7. Kavey, R-E., et al. Expert Panel on integrating guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. *Pediatrics*. 2011. 128(S6)S1-S44
8. Lee, J. et al. Diagnosis of diabetes using hemoglobin A1C: should recommendations in adults be extrapolated to adolescents? *Journal of Pediatrics* 2011 in press
9. Nowicka, P. Utility of Hemoglobin A1c for diagnosing prediabetes and diabetes in obese children and adolescents. *Diabetes Care*. 2011 34:1306-1311
10. ADA Position Statement. Standard of Medical Care in Diabetes- 2012. *Diabetes Care*. 2012.35(suppl 1) S11-S63