

CT Children's CLASP Guideline

Lipid Abnormalities

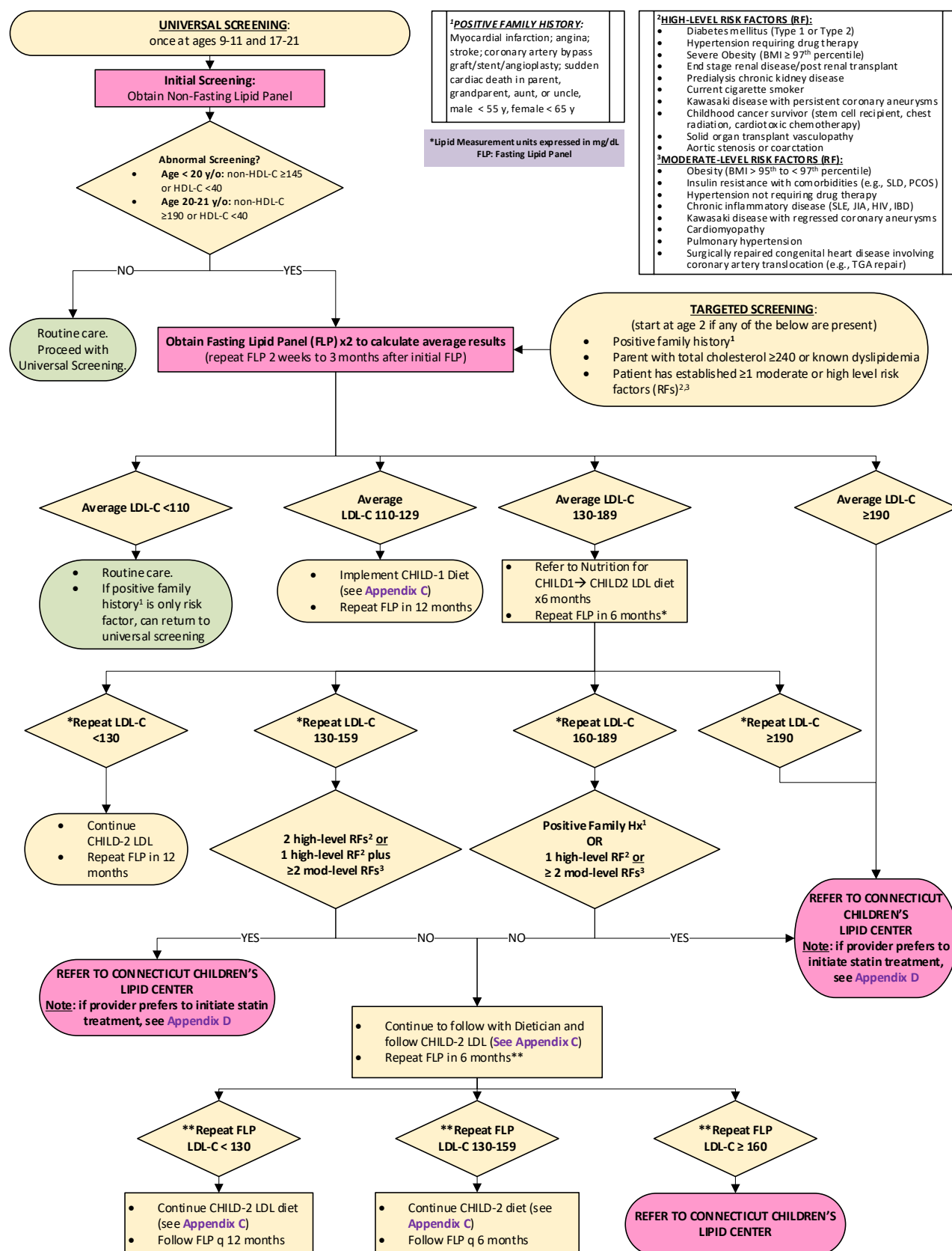
INTRODUCTION	Abnormal lipid levels are a significant risk factor for atherosclerosis that originates in childhood. This risk factor can be identified and managed early on in childhood to reduce the cardiovascular disease (CVD) burden. The AAP recommends universal lipid screening of all children and adolescents between ages 9-11 and 17-21 years. Targeted screening is not adequate due to the increased prevalence of obesity and dyslipidemia. Using family history of premature CVD alone misses 30-60% of children with dyslipidemia. Obese children present with dyslipidemia, which consists of elevated triglycerides (TG), low HDL-C, and elevated Non-HDL-C with or without elevated LDL-C levels. Familial hypercholesterolemia is a genetic form of elevated cholesterol levels where the children may or may not be obese and have significantly elevated LDL-C levels. Family history is usually positive in familial hypercholesterolemia (de Ferranti, 2015). Non-HDL-C appears to be more predictive of persistent dyslipidemia and can be accurately calculated in a non-fasting state. Total Cholesterol (TC) and LDL-C falls 10-20% or more during puberty, and hence, universal screening is recommended between ages 9-11 and 17-21 years. The 2011 Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children & Adolescents full report may be found at: https://www.nhlbi.nih.gov/files/docs/guidelines/peds_guidelines_full.pdf
INITIAL EVALUATION AND MANAGEMENT	For initial evaluation and management, please see: • Appendix A: LDL Screening Algorithm • Appendix B: Triglyceride Screening Algorithm
WHEN TO REFER	Information regarding when to refer can be found in: ▪ Appendix A: LDL Screening Algorithm ▪ Appendix B: Triglyceride Screening Algorithm
HOW TO REFER	Referral to Endocrinology LIPID CENTER via CT Children's One Call Access Center Phone: 833.733.7669 Fax: 833.226.2329 For more information on how to place referrals to Connecticut Children's, click here. Referral to WEIGHT MANAGEMENT PROGRAM for any patient with BMI $\geq$ 120 % of 95th percentile via CT Children's One Call Access Center Phone: 833.733.7669 Fax: 833.226.2329 For more information on how to place referrals to Connecticut Children's, click here. Information to be included with the referral: • Growth charts (height, weight, BMI) • Copies of relevant laboratory studies • Notes from recent visit

WHAT TO EXPECT

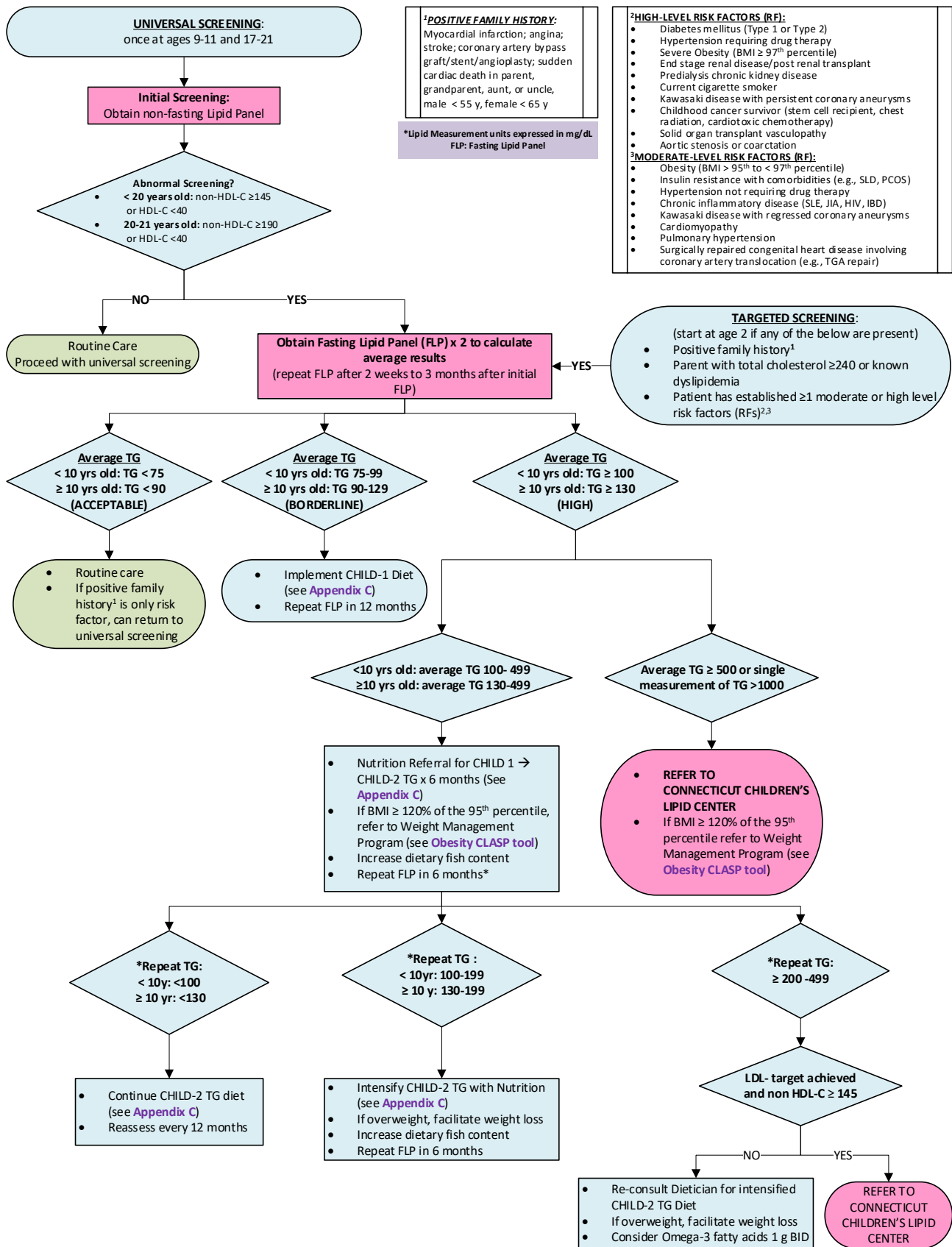
What to expect from CT Children's visit:

- Comprehensive history and physical
- Review of systems
- Additional laboratory studies and genetic testing, as indicated
- Nutritional counseling with a Registered Dietician (no separate Nutrition referral needed)
- Patient and family education on the diagnosis and management of lipid disorders
- Initiation of statin or another lipid-lowering drug therapy as needed

APPENDIX A: Target LDL Cholesterol Screening, Evaluation & Management



APPENDIX B: Target Triglyceride Screening, Evaluation & Management



APPENDIX C: CHILD-1 and CHILD-2 Diets (Cardiovascular Health Integrated Lifestyle Diet (CHILD))

CHILD-1 DIET (for implementation in Primary Care)

- Limit total fat intake to 25- 30% of total calories
- Limit saturated fat intake to 8-10% of calories
- Avoid *trans*-fat as much as possible
- Mono-unsaturated (MUFA)& poly-unsaturated (PUFA) fats upto 20% of total calories
- Limit dietary cholesterol < 300 mg/day
- **See Family Handouts:** (3) Foods to focus on for heart disease prevention (CT Children's Shopping Guide), and (7) Dyslipidemia Heart Healthy Tips (3) After school snack options

CHILD-2 LDL DIET (for implementation by Nutritionist)

- Limit total fats to 25-30% of total calories
- Limit saturated fat intake to $\leq 7\%$ of calories and 10% MUFA
- Avoid *trans*-fat as much as possible
- Limit dietary cholesterol to <200 mg/day
- Fiber recommendations:
 - >2 years of age: 14 grams of fiber per 1000 calories consumed
- Soluble Fiber:
 - 2-12 years old: 6 grams/day
 - >12 years old: 12 grams/day
 - Good sources of soluble fiber: flaxseed, beans, avocados, asparagus, broccoli, pears, oats, kale, apples
- If unable to consume goals with diet, use a fiber supplement (gummy, powder, psyllum fiber)
- **See Family Handouts:** (1) Dietary Fats and your heart-choosing wisely (English and Spanish version), (4) LDL Cholesterol- Lowering Nutrition Therapy, (5) High Fiber Diet, (6) Tips to lower cholesterol levels.

CHILD-2 TG DIET (for implementation by Nutritionist)

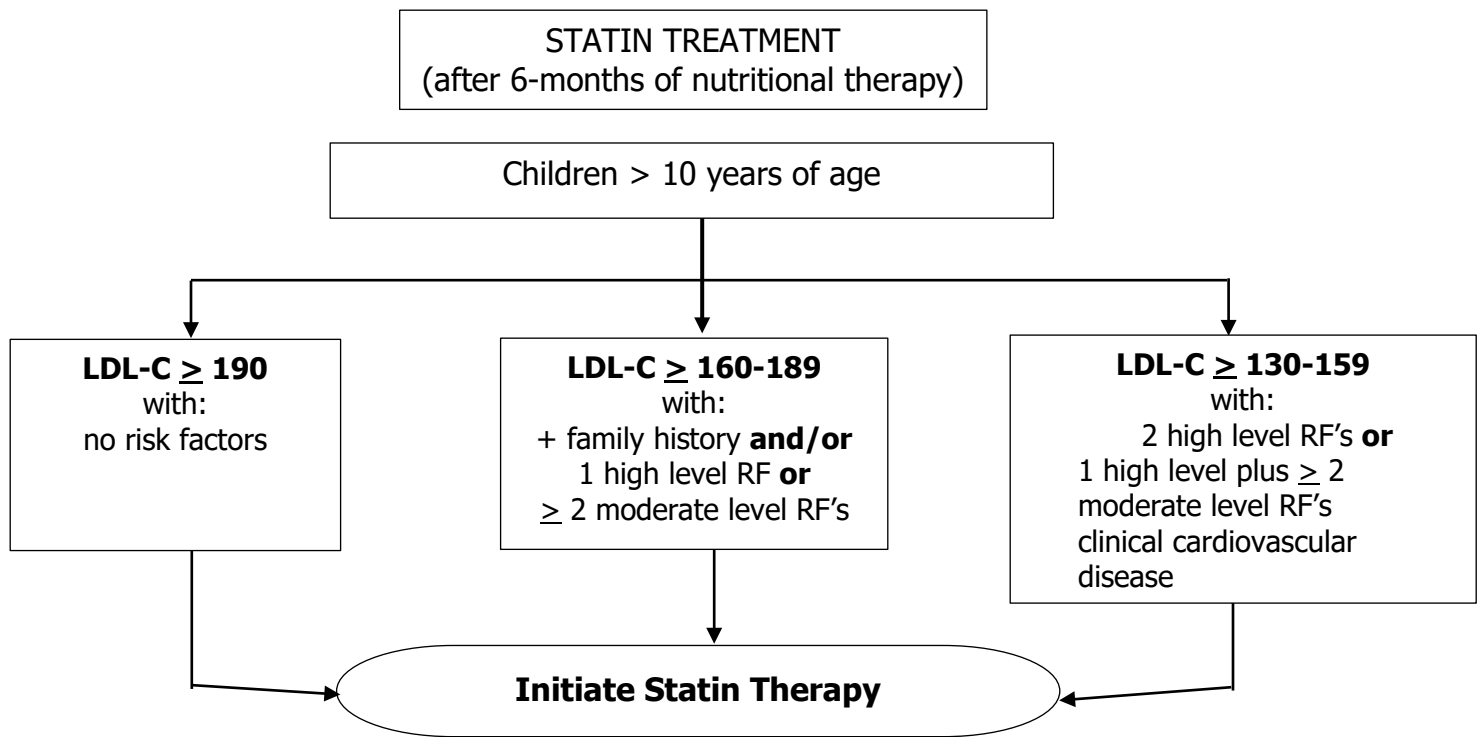
- In **addition** to CHILD-2 LDL diet: Decrease sugar intake:
 - Replace simple with complex carbohydrates
 - No sugar-sweetened beverage
- Increase dietary fish to increase omega-3 fatty acids **
- **See Family Handouts to Lower Triglycerides:** (8) Nutrition Tips to lower Triglycerides in children & (10) Omega- 3 fats in fish and seafood
 - ** The Food and Drug Administration (FDA) and the Environmental Protection Agency are advising women of childbearing age who may become pregnant, pregnant women, nursing mothers, and young children to avoid some types of fish and shellfish and eat fish and shellfish that are low in mercury. For more information, call the FDA's food information line toll free at 1-888-SAFEFOOD or visit [Mercury in Food | FDA](#)

CT Children's Clinical Nutrition

860-837-6294

<https://www.connecticutchildrens.org/search-specialties/nutrition/>

APPENDIX D: Pharmacotherapy Guide



- Initiate treatment with Atorvastatin 10 mg or Rosuvastatin 5 mg and repeat: ALT, glucose, HbA1C in 4 weeks
- Take medication daily at bedtime
- Discuss risk of muscle cramps, weakness, myopathy, and elevated liver enzymes
- Monitor CK if muscle symptoms
- Goal LDL-C < 130 mg/dl. If not achieved or side effects, recommend referral to CT Children's Lipid Center
- For more detailed flowchart- see UpToDate "Overview of statin therapy for hypercholesterolemia in pediatric patients ≥ 10 years old"

(Stone, et al. 2014)