Hyperlipidemia Algorithm

**Figure courtesy of the 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/ AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines.*

Atherosclerotic Cardiovascular Disease (ASCVD) Risk Calculators

- Predicts a patient's future (i.e., 10-year or lifetime) risk of cardiovascular event
- Your Electronic Medical Record (EMR) may have an ASCVD Risk Calculator. For example, at University Hospitals we have the ASCVD Risk Estimator Plus.
- If Coronary Artery Calcium score is available for patient, use a risk estimator that factors in this score, such as https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx
- Limitations for racial and ethnic groups: There is a greater level of uncertainty of the ASCVD risk estimates for African American men. Similarly the applicability is limited for other ethnic groups (Hispanic-Latinos) and may lead to underestimation in some groups (American Indians and South Asians) or overestimation in other groups (East Asians).

Primary Prevention:
Assess ASCVD Risk in Each Age Group
Emphasize Adherence to Healthy Lifestyle

LDL-C>190 mg/dL (>4.9 mmol/L)
No risk assessment; High-intensity statin
(Class I)

Diabetes mellitus and age 40-75 y
Moderate-intensity statin
(Class I)

Diabetes mellitus and age 40-75 y
Risk assessment to consider high-intensity statin
(Class IIa)

Age >75 y
Clinical assessment, Risk discussion

Age 0-19 y
Lifestyle to prevent or reduce ASCVD risk
Diagnosis of familial Hypercholesterolemia--statin

Age 20-39 y
Estimate lifetime risk to encourage lifestyle to reduce ASCVD risk
Consider statin if family history premature ASCVD and LDL-C >150 mg/dL (>4.1 mmol/L)

Age 40-75 y and LDL-C>70-<190 mg/dL
(>1.8-<4.9 mmol/L) without diabetes mellitus 10-year ASCVD risk percent begins risk discussion

ASCVD Risk Enhancers:

- Family history of premature ASCVD
- Persistently elevated LDL-C >160 mg/dL (>4.1 mmol/L)
- Chronic kidney disease
- Metabolic syndrome
- Conditions specific to women (e.g., preeclampia, premature menopause)
- Inflammatory disease (especially rheumatoid arthritis, psoriasis, HIV)
- Ethnicity (e.g., South Asian ancestry)

Lipid/Biomarkers:

- Persistently elevated triglycerides (>175 mg/dL, (>2.0 mmol/L)

In selected individuals if measured:

- hs-CRP > 2.0 mg/L
- Lp(a) levels > 50 mg /dL or >125 nmol/L
- apoB > 130 mg/dL
- Ankle-brachial index (ABI) < 0.9

These Clinical Practice Guidelines are guidelines only. In no way should these Clinical Practice Guidelines be used as a substitute for clinical or medical judgement.

< 5% "Low Risk"	5% - <7.5% "Borderline Risk"	>7.5% - 20% "Intermediate Risk"	>20% "High Risk"
Risk discussion: Emphasize lifestyle to reduce risk factors (Class I)	**Risk discussion:** If risk enhancers present then risk discussion regarding moderate-intensity statin therapy (Class IIb)	**Risk discussion:** If risk estimate + risk enhancers favor statin, initiate moderate-intensity statin to reduce LDL-C by 30% - 49% (Class I)	**Risk discussion:** Initiate statin to reduce LDL-C >50% (Class I)

If risk decision is uncertain:
Consider measuring Coronary Artery Calcium (CAC) in selected adults:
CAC= zero (lowers risk; consider no statin, unless diabetes, family history of premature CHD, or cigarette smoking are present)
CAC= 1-99 favors statin
CAC= 100+ and/or >75th percentile, favors statin plus aspirin

Quality Care Network

Cholesterol Management: Lifestyle + Medication

Elevated low-density lipoprotein cholesterol (LDL-C) is a known risk factor for atherosclerotic cardiovascular disease (ASCVD). Other "major risk factors include cigarette smoking, hypertension, dysglycemia, and other lipoprotein abnormalities" (Grundy e al., 2019).Management of high LDL-C is considered primary prevention of an ASCVD event. According to the US Preventative Services Task Force (2016), "Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the United States, accounting for 1 of every 3 deaths among adults." The UH Quality Care Network (UHQCN) physician led board of directors reviewed and approved this Clinical Practice Guideline (CPG).

Medication Management: Statin Therapy Daily Dose (2018 AHA Guide)

	High Intensity	Moderate Intensity	Low Intensity
LDL-C lowering	**>50%**	**30%-49%**	**<30%**
	Atorvastatin 40-80mg Rousuvastatin 20-40 mg	Atorvastatin 10-20mg Rousuvastatin 5-10mg Simvastatin 20-40mg Pravastatin 40-80mg Lovastatin 40-80mg	Simvastatin 10mg Pravastatin 10-20mg Lovastatin 20 mg

↳ Consider adding ezetimibe if statin intolerance or as secondary agent

↳ Consider adding PCSK9 inhibitor or referring to lipid specialist if statin and/or ezetimibe intolerant or not effective

Other Risk Factors for ASCVD:
Current High lifetime risk >40%
Chronic Kidney Disease (CKD)
Coronary Artery Calcium Score >300
HS C-Reactive Protein >2.0
Metabolic Syndrome/Prediabetes

Metabolic Syndrome Diagnostic Criteria:
Diagnosed if ≥ 3 of 5 criteria present:
- Waist circumference > 40 inches in men, >35 inches in women
- Triglycerides ≥ 150 mg/dL
- HDL-C < 40 mg/dL in men; <50 mg/dL in women
- Blood pressure systolic ≥ 130 and/or diastolic ≥ 85
- Blood glucose ≥ 100 mg/dL (fasting)

To refer a patient to a lipid specialist:
Contact the University Hospitals Harrington & Heart Vascular Institute at 216-844-3800

Triglyceride Management

Risk Factors of Hypertriglyceridemia

- Primary Cause
  - Genetic/familial traits
- Secondary Causes
  - Obesity
  - Type 2 Diabetes
  - HIV
  - Hepatocellular disease
  - Chronic inflammatory disease
  - Renal disease
  - Hypothyroidism
  - High consumption of alcohol or sugar-containing beverages
  - Pregnancy
  - **Use of certain medications**

Diagnostic Evaluation

- Optimum triglyceride level is below 100 mg/dL.
- Goal level for treatment of hypertriglyceridemia is below 150 mg/dL.
- Testing: Fasting state is important for accurate lipid profile
  - If non-fasting triglyceride level is ≥400mg/dL, repeat lab in fasting state.
  - VLDL-C (Very Low Density Lipoprotein Cholesterol) is the main carrier of triglycerides

Triglyceride Lab Results:
175-499 mg/dL (fasting or nonfasting) is Moderate hypertriglyceridemia
≥500 mg/dL is Severe hypertriglyceridemia

Tests to assess for secondary causes can include:

- A1C or fasting glucose
- Serum creatinine
- Thyroid-stimulating hormone
- Urinalysis (albumin/protein)

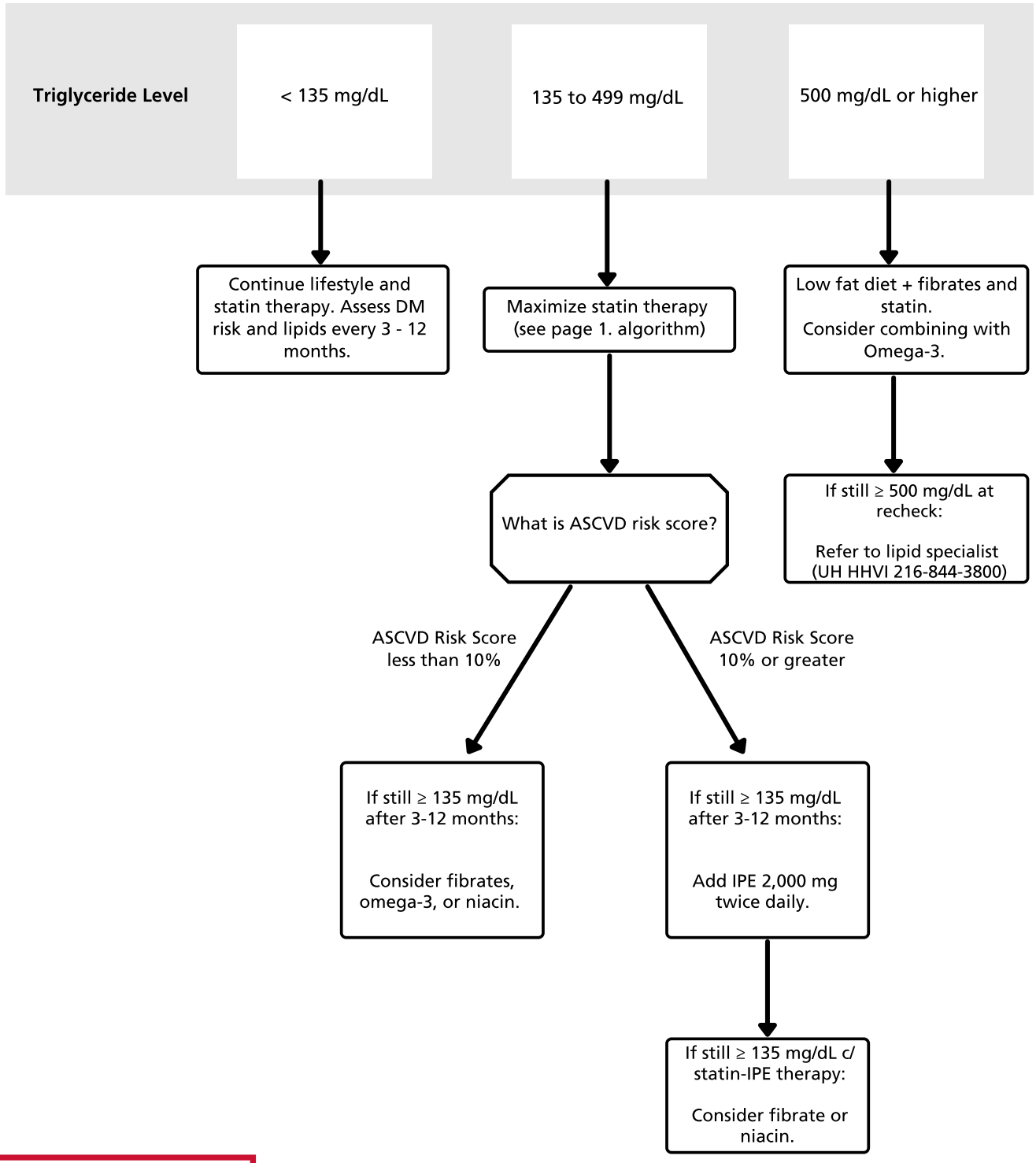
Practice Update: Icosapent Ethyl (IPE)

In December 2019, the FDA approved icosapent ethyl (IPE) for use as an adjunctive therapy to reduce the risk of cardiovascular events among patients with elevated triglycerides.

This approval was granted after a well-designed randomized control trial, "REDUCE-IT", showed a 25% reduction in major adverse cardiovascular events among high-risk patients who took IPE plus statin drugs, in comparison to patients treated only with statins.

Triglyceride Management Algorithm

For all patients with elevated triglycerides, counsel on therapeutic lifestyle changes (see below) and manage secondary causes of hypertriglyceridemia.



Source: AACE/ACE 2020

Social Determinants of Health Assessment

In order to engage and empower patients to be active in their care, it is also necessary to assess Social Determinants of Health (SDOH). Patients can be unwillingly impacted by SDOH, which will affect a patient's capacity to adhere to their treatment plan. Keep this in mind and assess accordingly to provide proper referrals to encircle the patients with support to achieve their optimal health. Consider:

- Financial restrictions can impact a patient's ability to afford a heart healthy diet and medications.
- Capacity to exercise as well as behavioral limitations that may need referrals to physical therapy or exercise support.
- Behavioral and/or psychological barriers that may be influencing and perpetuating lifestyle habits
- Health literacy and comprehension related to educational resources

Prevention and Lifestyle Modification:

Lifestyle and behavior modification is essential for treatment and further progression of the disease process. It is also necessary for prevention for patients that are at increasing risk for developing hyperlipidemia.

- Improve diet by eating a heart healthy diet
- Exercise weekly with either:
  - 150 minutes/week of moderate intensity aerobic exercise
  - 75 minutes/week of vigorous intensity aerobixc exercise
- Smoking cessation
- Strive to achieve a BMI < 25
- Limit alcohol to no more than:*
  - 2 drinks for men
  - 1 drink for women

**The American Heart Association (AHA,2017) defines drinks as: 12 oz. of beer, 4 oz. of wine, 1.5 oz 80-proof alcohol, or 1 oz. of 100 proof alcohol.*

Heart Healthy Diet:

A heart healthy diet according to the AHA (2015) emphasizes:

- Match energy balance with weight goals. Move more and watch portions for weight loss.
- Eat a variety of foods from all food groups.
- Eat a healthy diet that focuses on: colorful fruits and vegetables, whole grains, low-fat dairy products, skinless poultry and fish, nuts, seeds and legumes, non-tropical vegetable oils
- Eat a fish containing omega-3 fatty acids twice a week, such as salmon, tuna, steelhead trout, and sardines.
- Limit saturated fat, avoid trans-fat, eat red meat twice weekly, consume <2300 mg sodium daily, and limit sweets and sugar-sweetened beverages (consider the TLC diet)
- Read nutrition labels and eat more nutrient dense foods.
- Assess and adjust your portion sizes to meet health goals.
- Patient may benefit from a nutrition referral or food assistance.

Accuracy Matters.

Correct codes drive

- Accurate population health stats
- Accurate pay-for-performance
- Performance results

CODING	ICD10
Combined Hyperlipidemia, Mixed Hyperlipidemia	**E78.2**
Familial Combined Hyperlipidemia	**E78.4**
Dyslipidemia	**E78.5**

Quick Links

- ACC/AHH ASCVD Risk Calculator
- Million Hearts Model ASCVD Risk Simulator

Patient Resources

- CDC: Cholesterol
- AHA: Cholesterol Resource Center
- Cover My Meds
- Ohio Department of Health
- TLC Diet Handout

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