

# QUICK REFERENCE GUIDE TO DIABETES FOR HEALTH CARE PROVIDERS

A special project of the Michigan Diabetes Outreach Network

## Chapter 14

# Lipid Management in Diabetes

Lipid abnormalities are common in persons with diabetes (up to 70% of type 2 have lipid disorders). Some problems can be resolved through blood glucose control. Others will require dietary or pharmacological intervention.

### Desirable Lipid Levels (fasting)

	Cholesterol	LDL-cholesterol	HDL-cholesterol	Triglycerides
Adults	<200 mg/dl	<100 mg/dl <70 mg/dl (with cardiovascular disease)	> 40 mg/dl (men) > 50 mg/dl (women)	< 150 mg/dl
Children	<170 mg/dl	<100 mg/dl	> 35 mg/dl	< 150 mg/dl

### Testing (Fasting Lipid Profile)

- **Adults:** At diagnosis and every year or every 2 years if low risk (LDL<100, HDL > 50 and TG < 150)
- **Children with type 1 diabetes (under age 12):** There is no need to screen in absence of parental history of dyslipidemia or early coronary disease. If levels are abnormal, follow-up annually.
- **Children with type 1 diabetes (over age 12):** Screen at diagnosis, but after glycemic control is achieved. If initial screening is normal, repeat screening every 5 years. If levels are abnormal, follow-up annually.
- **Children with type 2 diabetes:** Screen at diagnosis, regardless of age, but after glycemic control is achieved. If levels are normal, follow-up every 2 years.

### Type 1

- Blood glucose control will often help correct dyslipidemia.
- Check thyroid function.

### Type 2

- Most common type of dyslipidemia: high triglycerides with low HDL.
- Usually have smaller, denser, more atherogenic LDL-particles
- Obesity exacerbates dyslipidemia.
- If no evidence of macrovascular disease; weight loss, increased activity, limiting alcohol, and controlling glucose can help.

## Lifestyle Therapies for Dyslipidemia

### 1. Improved BG control

- Most beneficial for those with type 1 diabetes
- Will help with hypertriglyceridemia
- May decrease LDL-cholesterol up to 15%

### 2. Fat restriction

- Total fat: 20-35% of total calories
- Saturated fat: < 7% of total calories
- Trans fat: minimize intake
- Polyunsaturated fat: up to 10% of total calories
- Monounsaturated fat: up to 20% of total calories
- Dietary cholesterol: < 200 mg/day

### 3. Increase fiber

- Total Fiber: 14 grams per 1000 calories
- Soluble fiber: 10-25 grams/day
- Plant stanols/sterols (found in margarines Benecol®, Take Control® and other foods): 2 grams/day

### 4. Modest weight loss

- 5-10% weight loss from current body weight

### 5. Increased physical activity

- Goal for adults: minimum of 150 min/week of moderate intensity aerobic activity (50-70% of max HR)
- Resistance training is recommended in those without contraindications up to 3 times per week.
- Goal for children: 60 minutes most days of the week

### 6. Smoking cessation

- Will lead to improvements in lipid profile.

## Treatment of Dyslipidemia in Adults with Diabetes (order of priorities)

Statin therapy should be added to lifestyle therapy (regardless of baseline lipid levels) for the following persons with diabetes:

- Those with overt cardiovascular disease (CVD)
- Those without CVD who are > 40 yrs with 1 or more CVD risk factors (smoking, high blood pressure)
- Consider use in those without overt CVD or under age 40 if LDL is >100 or has multiple CVD risk factors

### 1. LDL-cholesterol lowering

- 1st Choice: HMG CoA Reductase Inhibitors (statins)
- 2nd Choice: Bile Acid Binding Resins (resins) or Fibric Acid Derivatives (fibrates)

### 2. HDL-cholesterol raising

- 1st Choice: increase physical activity (see lifestyle therapies above)
- 2nd Choice: Nicotinic acid (with caution due to BG raising) or fibrates

### 3. Triglyceride lowering

- 1st priority: BG control
- 1st Choice: fibrates
- Statins are moderately effective in those with elevated LDL also.
- Fish oil supplementation with omega-3 fatty acids may help lower triglycerides that are not responding to medication.

### 4. Combined hyperlipidemia

- 1st Choice: Lifestyle intervention plus a statin
- 2nd Choice: Lifestyle intervention plus a fibrate
- 3rd Choice: Lifestyle intervention plus a resin and a fibrate OR lifestyle intervention plus a statin and nicotinic acid (must monitor BG carefully)

## Treatment of Diabetic Dyslipidemia in Children

1. Lifestyle intervention (see above) for LDL-cholesterol of 100-129 mg/dl
  
2. Consider pharmacological intervention for LDL cholesterol 130-159 mg/dl
  - Maximize lifestyle intervention
  - Base decision on complete CVD risk profile, including assessment of blood pressure, family history and smoking status.
  
3. Pharmacological intervention for LDL cholesterol 160 mg/dl
  - Bile acid sequestrants (resins) are often recommended as first choice in this age group.
  - Statins can be used with caution. Initiate at lowest available dose and increase based on LDL levels and side effects, and monitor LFTs.
  - Statins should be discontinued if there is complaint of significant muscle pain or soreness.
  
4. Elevated triglycerides
  - Maximize lifestyle intervention
  - If levels > 1000 mg/dl, treatment is necessary. Consider fibrate.
  - Fish oil supplementation with omega-3 fatty acids may help lower triglycerides that are not responding to medication.

### Resources:

American Diabetes Association (2008). Clinical Practice Recommendations. *Diabetes Care*. Vol 31 (1).

American Diabetes Association (2003). Management of Dyslipidemia in Children and Adolescents with Diabetes. *Diabetes Care* 26:2194-2197.

American Heart Association (2006). Dietary and Lifestyle Recommendations. June 19 Rapid Access issue of *Circulation*.