**Lipid Screening & Treatment Protocol**

### Primary Prevention – No Known Vascular Disease

**Age 18-21**
- No Screening

**Action**: Put hyperlipidemia on the Problem List and the story of treatment decisions in the overview.

**Secondary Causes for Hyperlipidemia Most Commonly Encountered in Clinical Practice**

<table>
<thead>
<tr>
<th>Secondary Cause</th>
<th>Elevated LDL-C</th>
<th>Elevated Triglycerides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td>Saturated or trans fats, weight gain, anorexia</td>
<td>Weight gain, very low-fat diets, high intake of refined carbohydrates, excessive alcohol intake</td>
</tr>
<tr>
<td>Drugs</td>
<td>Diuretics, cyclosporine, glucocorticoids, amiodarone</td>
<td>Oral estrogens, glucocorticoids, bile acid sequestrants, protease inhibitors, retinoic acid, anabolic steroids, sirolimus, relaxifene, tamoxifen, beta blockers (not carvedilol), thiazides</td>
</tr>
<tr>
<td>Disease</td>
<td>Biliary obstruction, nephrotic syndrome</td>
<td>Nephrotic syndrome, chronic renal failure, lipodystrophies</td>
</tr>
<tr>
<td>Disorders &amp; altered states of metabolism</td>
<td>Hypothyroidism, obesity, pregnancy</td>
<td>Diabetes (poorly controlled), hypothyroidism, obesity, pregnancy</td>
</tr>
</tbody>
</table>

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Primary prevention in non-diabetics already on a statin, but risk not previously calculated using ASCVD model & 2013 guidelines

Do you know a pre-statin LDL?

YES

Was it >190?

YES

Prescribe high intensity statin

NO

NO

Use pre-statin LDL to calculate AS CVD risk

Is the 10 yr ASCVD risk ≥ 7.5%?

YES

Consider 2-3 month trial of statin; recheck fasting lipid panel; recalculate AS CVD risk with new number

NO

Treat with moderate to high intensity statin

Refr to Dietician

New acute cardiac event?

NO

Patient previously on statin or evaluated for secondary causes of hyperlipidemia?

NO

See Acute Cardiovascular Event

YES

Age > 75?

YES

Treat with moderate to high intensity statin

NO

Treat with high intensity statin

At discharge, consider continuation of 80mg atorvastatin daily (especially in younger patients with known additional disease) vs. 40mg daily

Positive Calcium Score

What was calcium score?

> 400

Cardiology Referral

Cardiology Referral

Follow primary prevention guidelines

100 - 400

Follow primary prevention guidelines

< 100

Even though these patients are told their score is abnormal, primary prevention is the only needed intervention

Most insurers, including Medicaid & most BCBS plans do cover dietician visits for hyperlipidemia. Medicare does not, but if the patient has a BMI of > 30 they will cover with the diagnosis of obesity & generally the same topics will be covered by the dietician.

Acute Cardiovascular Event

Patient presents with Acute MI

Start atorvastatin 80 mg daily

Draw lipid panel first AM fasting

At discharge, consider continuation of 80mg atorvastatin daily (especially in younger patients with known additional disease) vs. 40mg daily

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Treatment of Lipids

Lifestyle modifications of diet & exercise recommended for all

Is the patient female of child bearing age?

YES

Patient can not be on a statin while pregnant. Evaluate risk of treatment vs. future pregnancy

NO

What intensity will be used?

MODERATE

Give Atorvastatin Handout

HIGH

Give Atorvastatin 20mg tablet, tablet daily

Then 1 full tablet daily

Then 2 tablets daily

Increase to one 80mg tablet daily

Recheck lipid panel with provider visit at 12 weeks

Prescribe Atorvastatin 10mg tablet

Days 1-7

Days 8-14

Days 15-28

Days 29 & Beyond

Week 12

Recheck lipid panel with provider visit at 12 weeks

Prescribe Atorvastatin Handout

Give Cholesterol Quiz Handout

Did you get the expected decrease in LDL (30%)?

YES

Continue treatment. see Ongoing Lab Evaluation

NO

Insufficient Response Evaluation - Assess for:

- Medication adherence
- Lifestyle change adherence
- Possible secondary causes of hyperlipidemia - at a minimum draw TSH if not already completed

Increase Atorvastatin to 20mg tablet

Recheck lipid panel at 8-12 weeks

Consider adding Ezetimibe 10mg

If no response, refer to endocrinology or cardiology for use of newer injectable agents

Prescribe Atorvastatin 20mg tablet, tablet daily

Then 1 full tablet daily

Then 2 tablets daily

Increase to one 80mg tablet daily

Recheck lipid panel with provider visit at 12 weeks

Ongoing Laboratory Evaluation

- Lipid Panel 1x Annually
- ALT/AST only if symptoms of hepatic toxicity (unusual fatigue or weakness, loss of appetite, abdominal pain, dark colored urine, yellowing of skin or sclera)
- CK should only be done if myalgias

Nurses can help place lipid panel order every 12 months in stable dose med or 12 weeks after med or dose change.

If no response, refer to endocrinology or cardiology for use of newer injectable agents

Comments on Other Agents

- Niacin: If patient is on Niacin, this medication should be discontinued as it may increase death rate
- Gemfibrozil or other fibrates
  - Increases risk of muscle toxicity
  - Can be used for prevention of pancreatitis in those with elevated TGs, but there is no evidence to support using it for cardiac prevention
- Ezetimibe should not be used as mono-therapy unless no statin is tolerated. There is some evidence in secondary prevention literature that this may be of benefit.
- Cholestyramine: Recommended only for pregnant women with extremely high LDL who are felt to need treatment during pregnancy
- Co-Enzyme Q10: Debatable evidence for myalgia reduction with statin treatment
- Omega 3 Fatty Acids: No current evidence as to cardiovascular benefit
- Vitamin E: No current evidence as to cardiovascular benefit
- Red Yeast Rice: No proven benefit.

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Myalgia at any point in treatment

- Draw CK & TSH
  - CK elevated? YES
    - 2-4 week trial off statin
      - Resume drug at previous decreased dose
      - Did myalgias return?
        - NO: Continue treatment
        - YES: Repeat 2-4 week trial off statin
  - NO
    - Give Myalgias in Statins Handout
    - Hypothyroidism is the most common of the conditions that may increase the risk for myalgia. If abnormal, evaluate and treat as you otherwise would.

Recommendation is to titrate patient to maximum tolerated dose (up to the recommended dose for their intensity level) of whichever medication is selected. Every other day dosing may help with tolerance of medication.

- Does patient need a high intensity statin?
  - NO
    - Consider use of:
      - Rosuvastatin (5) – 10mg daily
      - Simvastatin – 20-40mg daily
      - Pravastatin 40 – 80mg daily
      - Fluvastatin XL – 80mg daily
      - Fluvastatin – 40mg 2x daily
      - Pitavastatin – 2-4mg daily
  - YES
    - Rosuvastatin 20mg
      - Does patient need a high intensity statin?
        - NO
          - Consider use of:
            - Rosuvastatin (5) – 10mg daily
            - Fluvastatin XL – 80mg daily
            - Pravastatin 40 – 80mg daily
        - YES
          - Consider use of:
            - Rosuvastatin (5) – 10mg daily
            - Fluvastatin XL – 80mg daily
            - Pravastatin 40 – 80mg daily

Any abnormality – including heterozygous – is considered abnormal.

Note: Doses in *italics* have not been validated in randomized controlled trials.

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Clinical Pearls

1. Grapefruit juice inhibits CYP3A4; however, daily consumption of eight ounces of grapefruit juice, or one-half of a grapefruit or less, is unlikely to increase the risk of an adverse interaction or muscle injury. (See Concurrent Drug Therapy above.)

2. There is no evidence that atorvastatin is better taken in the evening. It can be taken at any time of day.

3. **Hypothyroidism and other disorders** — Enhanced susceptibility to statin-associated myopathy occurs in patients with hypothyroidism, acute or chronic renal failure, and obstructive liver disease. In one hypothyroid patient, the myopathy resolved promptly after discontinuation of pravastatin and before initiation of thyroid hormone replacement [54], but in a second case the myopathy persisted until thyroid hormone was replaced [55]. These reports suggest that hypothyroidism may predispose to the development of statin-associated myopathy and that use of statins may “unmask” hypothyroid myopathy. (See “Hypothyroid myopathy”.)

References

2. American Diabetes Association- Standards of Care in Diabetes—2015