



2017

Assessing Provider Adherence to the 2013 ACC/AHA Hyperlipidemia Guideline

Adrienne Johnston
University of Kentucky, asosbo2@uky.edu

[Right click to open a feedback form in a new tab to let us know how this document benefits you.](#)

Recommended Citation

Johnston, Adrienne, "Assessing Provider Adherence to the 2013 ACC/AHA Hyperlipidemia Guideline" (2017). *DNP Projects*. 136.
https://uknowledge.uky.edu/dnp_etds/136

This Practice Inquiry Project is brought to you for free and open access by the College of Nursing at UKnowledge. It has been accepted for inclusion in DNP Projects by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Running head: PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

Final DNP Project

Assessing Provider Adherence to the 2013 ACC/AHA Hyperlipidemia Guideline

Adrienne Johnston RN, BSN

University of Kentucky

College of Nursing

Spring 2017

Judi Daniels, PhD, APRN—Committee Chair and Academic Advisor

Elizabeth Tovar, PhD, APRN—Committee Member

Jessica Sass, MSN, APRN—Committee Member/Clinical Mentor

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

Table of Contents

List of Tables	iv
List of Figures	v
Abstract	1
Background and Significance	2
ASCVD Prevention	5
Purpose	7
Methods	7
Design	7
Sample	7
Data Collection	8
Data Analysis	8
Results	9
Discussion	10
Barriers to Implementation	12
Limitations	13
Implications for Practice	14
Conclusions	15
References	16
Appendix A	24
Appendix B	26

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

List of Tables

Table 1—2013 Guideline Recommended Statin Intensity..... 20
Table 2— Demographics and Descriptive Statistics for 2016 21
Table 3— Demographics and Descriptive Statistics for 2015 22

List of Figures

Figure 1— Present Co-morbidities23

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

Abstract

Background: Atherosclerotic cardiovascular disease (ASCVD) is the leading cause of death in the United States and accounts for more than 17.3 million deaths per year with hyperlipidemia as one of the leading risk factors. The 2013 American Heart Association/American College of Cardiology (AHA/ACC) hyperlipidemia guideline recommends healthy lifestyle habits, risk estimation of the development of cardiovascular disease using a risk calculator, and intensity dosed statin therapy. There has been controversy among providers resulting in confusion and inconsistent application of the guideline. **Purpose:** The purpose of this project was to examine provider adherence to the AHA/ACC hyperlipidemia guideline in a primary care clinic. The evaluation included appropriate intensity statin therapy according to the ASCVD risk score and evidence of provider discussion of healthy lifestyle habits. **Methods:** A retrospective chart review was conducted in which 150 patients between the ages of 45 to 75 were randomly selected who had an active diagnosis of hyperlipidemia and were currently on statin therapy. Documentation was reviewed for discussion of healthy lifestyle habits, a calculated ASCVD risk score, and appropriate intensity statin therapy. Data was reviewed in 2015 and 2016. **Results:** In this sample, 40% of patients with hyperlipidemia were not receiving the recommended statin therapy based on their ASCVD risk score, which had been calculated by the provider on 23% of patients. Of statistical significance ($p = 0.001$), men (63%) were on appropriate intensity statin therapy, more often than women (37%). Discussion of lifestyle modifications took place in 50% of the visits. **Conclusion:** Based on the results of this review, there is room for improvement among providers in the evaluation and treatment of hyperlipidemia patients recommended by the 2013 guideline.

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

Assessing Provider Adherence to the 2013 ACC/AHA Hyperlipidemia Guideline

Cardiovascular disease is the leading cause of death in the United States. It accounts for 17.3 million deaths per year with an anticipated increase in annual mortality to more than 23.6 million by 2030 (Mozaffarian et al., 2015). Kentucky is ranked eighth in cardiovascular disease death rates accounting for 30% of all deaths in 2009 (Kentucky Cabinet for Health and Family Services, 2015). It is imperative that health providers focus on improving cardiac health in order to reduce the burden of cardiovascular disease. One key intervention is helping patients manage their cholesterol, a known risk factor for cardiac disease. The advents of new treatment guidelines have not yet been fully endorsed by healthcare providers. The purpose of this project was to examine provider adherence to the elements of the American Heart Association/American College of Cardiology hyperlipidemia guideline in a primary care clinic.

Background and Significance

Hyperlipidemia is present in one in six American adults (CDC, 2015). It refers to increased levels of lipids or fats in the blood and is one of the most significant risk factors for atherosclerotic cardiovascular disease (ASCVD). A lipid panel includes measurements of total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL) and triglycerides. Total cholesterol is a measure of the total amount of cholesterol in the blood and is calculated from a formula including HDL, LDL, and triglycerides (CDC, 2015). LDL is considered “bad” cholesterol and high levels can lead to plaque buildup in arteries causing heart disease and stroke. HDL, the “good” cholesterol, absorbs cholesterol and carries it to the liver where it is flushed from the body. Triglycerides are fats in the blood the body uses for energy (CDC, 2015).

The risk for heart disease is doubled in individuals with high total cholesterol, defined as greater than 240 mg/dl. Seventy-three million adults in the United States have high low-density

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

lipoprotein (LDL), defined as greater than 189 mg/dL. Less than half of adults with high LDL are receiving treatment to lower their levels and less than one in three adults with high LDL have the condition under control. Some risk factors for hyperlipidemia are cannot be controlled, such as age, gender, and heredity; however, modifiable risk factors can be controlled and include an unhealthy diet, being overweight or obese, smoking, and lack of exercise (CDC, 2015).

The previous hyperlipidemia clinical practice guideline was known as Adult Treatment Panel III (ATP III). In addition to obtaining a fasting lipid panel, it recommended identifying the presence of clinical ASCVD and/or the presence of major risk factors other than LDL that may modify LDL goals (National Heart, Lung, and Blood Institute, 2001). If more than two risk factors were present without a diagnosis of coronary heart disease, a risk score would be obtained using the Framingham calculator sorting them into one of three levels: <10%, 10-20%, and >20%. The patient would then be placed into a risk category. Based upon their risk, there would be an LDL goal, an LDL level at which to start lifestyle changes, and an LDL level at which to consider starting medication. This guideline also recommended medications in addition to statins, such as bile acid sequestrants, nicotinic acid, and fibric acids (National Heart, Lung, and Blood Institute, 2001).

Evolving evidence over the past fifteen years led to the development of an updated guideline for lipid management, which was published in 2013 by the American College of Cardiology and American Heart Association. The goal was to provide primary care providers with evidence-based recommendations easy to use in the clinical setting (Stone et al., 2014). A ten-year risk score, calculated by the Pooled Cohort Equation, is based on data from multiple community-based populations and is applicable to African-Americans and non-Hispanic men and women ages 40 to 75 with no preexisting cardiovascular disease (Stone et al., 2014). In

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

contrast to the Pooled Cohort Equation, the Framingham calculator used in ATP III did not consider ethnicity other than Caucasian, a diagnosis of diabetes, and was calculated for ages 30-79.

The calculated ASCVD risk score ultimately determines the level of statin intensity and is an estimate of a person's ten-year risk for a cardiovascular event (Stone et al, 2014). The information required to calculate the risk is age, gender, race, total cholesterol, HDL, systolic blood pressure, if treatment for high blood pressure is present, diabetes diagnosis, and smoking status. Statin therapy is recommended in any risk score greater than or equal to 7.5% (Stone et al., 2014).

Reduction of ASCVD risk identified in the 2013 guideline includes lifestyle modifications (i.e. healthy diet, regular exercise, avoidance of tobacco, and healthy weight) and statin therapy. The lifestyle modifications have been emphasized more than that of the ATP III, but it is the statin therapy that underwent the greater change. Four main statin benefit groups have been identified (see Appendix B) with statin therapy divided into low-intensity, moderate-intensity, and high-intensity (see Table 1). In addition, specific medications are recommended along with their respective dosing.

Based on evidence from randomized controlled trials, the 2013 guideline recommends using a fixed dose of a statin to reduce the risk of ASCVD in adults 21 years and older (Stone et al., 2014). Research demonstrates that using a fixed moderate to high dose statin when initiating therapy results in a higher decrease in LDL than starting with a lower dose and titrating up. Previous guidelines have recommended specific LDL and cholesterol targets; however, there is no evidence to support this. Therefore, the ACC/AHA guideline does not include

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

recommendations for specific LDL or non-HDL targets in the prevention of cardiovascular disease (O’Riordan, 2013).

ASCVD Prevention

ASCVD prevention is dependent upon lifestyle modification as well as statin therapy. A study by Barnard (1991), though dated, demonstrated the effect lifestyle modification has on serum lipid levels. The program included 4,587 adults who attended a three-week lifestyle modification program consisting of a high complex carbohydrate, high-fiber, low fat, and low-cholesterol diet. In addition, patients were encouraged to engage in daily physical activity, primarily walking. The post study intervention revealed total cholesterol values were reduced by 23%, LDL was reduced by 23%, and triglyceride levels were reduced by 33% (Barnard, 1991). Though this research is over twenty years old, the principles remain applicable today.

A healthy lifestyle defined by the AHA includes a healthy diet, regular exercise, avoidance of tobacco products, and maintaining a healthy weight. The recommended diet is one high in vegetables, fruits, whole grains, low-fat dairy products, and lean meats, with limited saturated fat and less than 2400mg of sodium intake daily (Claas & Arnett, 2016; McKibben, Al Rifai, Mathews, & Michos, 2016). Adults should engage in moderate to vigorous physical activity three to four times a week lasting approximately forty minutes and include muscle-strengthening exercises at least twice a week. Healthy weight is defined as a BMI between 18.5 and 24 kg/m² and a waist circumference <35 inches (McKibben et al., 2016).

The changes in statin therapy were redesigned in the new 2013 guideline. They are considered the first-line pharmaceutical treatment for patients with hyperlipidemia, but have also proven beneficial in primary prevention of ASCVD. Not only do they lower LDL by as much as 55%, they also improve endothelial lining, help stabilize atherosclerotic plaques, reduce

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

inflammation and damage from oxidative stress, and prevent platelet aggregation reducing the risk of a thrombus (Cleveland Clinic, 2015). Statin therapy reduces the five-year risk of death, myocardial infarction, and stroke. There is no evidence supporting the use of non-statin lipid-lowering medications, such as Zetia, niacin, fibrates, and omega-3 fatty acids, in the primary prevention of ASCVD and should only be used if there is a documented statin intolerance (Last, Ference, & Menzel, 2017).

There has been some controversy among health providers about the 2013 guidelines in comparison to ATP III. Most of the controversy relates to statin prescribing in primary prevention of ASCVD. Some feel the new Pooled Cohort Equation overestimates risk and reaches the 7.5% threshold for consideration of statin therapy for age alone (Newsome, 2014). Outside of the concerns regarding the potential overprescribing of statins, there is also the difficulty in changing practice from titrating therapy to a fixed dose. Providers have had difficulty not treating to an LDL goal as identified by a specific number (Newsome, 2014).

The previous perceived incidence of liver injury has been minimized, as there is little evidence to support liver toxicity from statins. Providers still tend to over-monitor liver enzymes due to their continued fear of statin intolerance. The concern regarding statin induced myopathy, reported in 1-29% of patients, is not a reason to discontinue its use. The Statin Intolerance Panel encourages continued use of some form of statin therapy except in the instance of a true allergy. For those that are unable to tolerate daily dosing, weekly or every-other-day dosing with rosuvastatin or atorvastatin may still provide significant reductions in LDL. Research has demonstrated that the statin benefit of ASCVD risk reduction greatly outweighs potential adverse effects (Robinson, 2014). Although statin prescribing among providers has increased over the

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

years, ways to overcome these controversies and improve provider prescribing of statins need to be investigated.

Purpose

The purpose of this project was to evaluate statin prescribing among providers at the UK Family and Community Medicine Clinic according to the 2013 ACC/AHA Hyperlipidemia Guideline. The primary aim was to examine prescribing patterns among the healthcare providers. Other aims of this project included how often discussion of lifestyle modifications and documentation of a calculated ASCVD risk score was present. By examining current provider practices, baseline data will be provided for future quality improvement initiatives.

Methods

Design

A descriptive study using a retrospective chart review of 150 patients was examined for the current management of ASCVD risk and statin medication prescribing practices of primary care providers (PCPs) at the UK Family and Community Medicine Clinic. The clinic is comprised of 20 attending physicians, 21 resident physicians, and 8 nurse practitioners that together see approximately 3500 patients a month. They see patients of all ages throughout the lifespan.

Sample

The UK Center for Clinical and Translational Science provided a list of all patients seen at the clinic from January 1, 2016, to September 30, 2016 and who met inclusion criteria. Patients included in the review were between the age of 45 to 75, diagnosed with the ICD10 codes for high cholesterol, hyperlipidemia, or dyslipidemia, and currently on a statin medication. Patients excluded from the chart review include those less than 45, over age 75, no active

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

diagnosis of hyperlipidemia, or not on statin therapy. The age of 45-75 was determined as that that is the age range used in the Pooled Cohort Equation. A total of 443 patients were identified and from that list 150 were randomly chosen for review. The chart review was conducted from the Allscripts electronic health record (AEHR). IRB approval was obtained through the University of Kentucky.

Data Collection

The charts for 150 patients seen for hyperlipidemia in 2016 were reviewed. If they were a patient of the clinic and had been diagnosed with hyperlipidemia either in 2015 or before, a visit for hyperlipidemia in 2015 was also reviewed. See Appendix A for all information collected ranging from demographics and co-morbid conditions to current and past treatment for hyperlipidemia. Information was collected for 2016 and where possible, 2015. The principle investigator calculated and recorded an ASCVD risk score for 2016 and 2015.

The chart review was performed using a UK issued computer on a secured server network. A codebook was created and all information was stored in an Excel spreadsheet on the principle investigators password protected computer. Patient consent was waived in accordance with IRB regulations since the nature of the data collection was a retrospective medical record review, where patient identifiers were not collected.

Data Analysis

The data collected was entered into an Excel spreadsheet and exported to the IBM Statistical Package for the Social Sciences (SPSS) software for statistical analysis. Descriptive statistics and frequency distributions summarized the sample. Bivariate analysis tested for differences in adherence by demographic and clinical variables. Chi-square tests of association

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

and fisher's exact tests were used for categorical variables. Mann-Whitney U tests were used for differences with ordinal demographics. A p-value of 0.05 determined statistical significance.

Results

A total of 150 patients were randomly selected for inclusion in the chart review. Of the 150 patients reviewed in 2016, 138 were reviewed in 2015. The other twelve patients were either diagnosed with hyperlipidemia in 2016, or were not seen at the clinic prior to 2016. There was equal gender distribution and the majority (73%) classified themselves as Caucasian. The age of the sample ranged from 45-75 with over 70% being between 50 and 70. Sixty-five percent of the sample reviewed had a BMI greater than 30kg/m². Only 19% of the total sample currently smoked in both 2015 and 2016. See Tables 2 and 3 for all demographic information. Hypertension, Diabetes, and Obesity were the most common co-morbidities among patients (see Chart 1).

In terms of lifestyle variables, providers addressed diet and exercise approximately 50% of the time in 2016. This was slightly higher than in 2015, where diet and exercise were addressed 45% of the time. In 2015, 30% of the sample reported making a lifestyle change in either diet or exercise. This percentage was higher in 2016, wherein 45% of the sample had made some type of lifestyle change. Among the 19% of current smokers, smoking cessation was discussed approximately 70% of the time in 2016 and 60% of the time in 2015.

Looking at current statin prescribing, atorvastatin was the most common statin used (65%), followed by simvastatin and pravastatin each prescribed 16% of the time. Over 50% of patients reviewed had been on a statin medication more than five years. Fifty-nine percent were on appropriate statin therapy in 2016 and 53% were on appropriate therapy in 2015. In 10% of those not on the appropriate statin intensity, clinical documentation was present to justify the

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

dosage. Of statistical significance ($p = 0.001$), males (63%) were on appropriate statin therapy more often than females. A calculated ASCVD risk score was present in 23.3% of the charts in 2016 and 20.3% of the charts in 2015. The mean ASCVD risk score was around 15% in both 2016 and 2015.

Lab monitoring and other previously recognized therapies for management of hyperlipidemia were also reviewed. Liver enzymes were checked prior to statin initiation in 90% of patients and liver enzymes and lipid panels were monitored yearly in almost 80% of patients. No patients reviewed had been prescribed a bile acid sequestrant, 0.7% had been prescribed a niacin, 1.3% prescribed Zetia, 3.3% prescribed a fibrate, and 8.7% taking Omega-3 fatty acids.

Discussion

The purpose of this study was to determine if primary care providers at the UK Family and Community Medicine Clinic were following the recommendations of the 2013 hyperlipidemia guideline and prescribing appropriate intensity statin therapy. Adherence to the hyperlipidemia guideline can help in prevention of cardiovascular disease and the management of it. Further, looking at the cost to the healthcare system, it is prudent for all providers to address this important issue. The direct and indirect cost of cardiovascular disease totals more than \$320.1 billion, including health expenditures and lost productivity (Mozaffarian et al., 2015).

This sample was well representative in terms of gender and age. What was not well represented was ethnicity as the majority of patients seen were Caucasian. It is interesting to note that 63% of males had appropriate statin therapy whereas only 37% of females were prescribed the appropriate dosage. Prior to the most recent literature, cardiovascular disease was

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

not well treated in women and research was lacking related to the benefit of statin therapy for primary prevention in women (McKibben et al., 2015). This may say something to the emphasis providers give toward women and warrants further investigation.

There is a high incidence of hypertension, diabetes, and obesity in patients with dyslipidemia. Of the sample, fifty-one patients (34%) had all three co-morbidities: hypertension, diabetes, and obesity. According to recent statistics from the World Health Organization (WHO), one in three adults worldwide has hypertension and 10% of people have diabetes. From 2013 to 2014, 38% of U.S. adults over the age of 20 were considered obese while 71% were considered overweight or obese (CDC, 2016). It is interesting to note that only 19% of the sample smoked, especially since rates of smoking in Fayette County are approximately 25% (Kentucky Department for Public Health, 2008). One might wonder if there were instances of smoking status not being documented or if efforts at encouraging and facilitating smoking cessation have been successful.

According to the results of this review, 40% of patients are not receiving the appropriate intensity statin therapy recommended by the guideline. Of the patients not on the appropriate statin intensity, clinical documentation to support the current dose was only found in 10%. One possibility is that the dosage from 2015 was continued because the lipid panel had improved from the previous year. Had an ASCVD risk score been calculated per recommendation of the guideline, the provider may have prescribed a higher intensity statin. It could also be that with the presence of so many other issues, providers were focused on all the other chronic conditions and the statin was not re-evaluated due to time constraint (Parker et al., 2008).

In addition, a calculated ASCVD risk score was only documented approximately 20% of the time. This could indicate an over or underestimation of patient risk by not using a risk

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

calculator. Research has demonstrated that the use of a risk calculator to accurately estimate a patient's cardiovascular risk improves statin prescribing among providers (Sekaran, Sussman, Xu, & Hayward, 2013). Sixty-six percent of patients with an ASCVD risk calculated and documented were on appropriate statin therapy. The calculated ASCVD risk score decreased from 2015 to 2016 in 54% of patients. Of the 60% of patients on appropriate statin intensity therapy, 48% had a decrease in their risk score from 2015 to 2016. Several of the risk scores present were documented as part of the patient's diabetes care plan and were listed as < 7.5% or > 7.5%. Some providers may have estimated the risk based upon their own assessment rather than actually calculating the risk score.

Heart healthy lifestyle habits are the foundation of ASCVD prevention. According to this review, providers are only discussing healthy lifestyle habits approximately half of the time. The majority of the patients included in this study were not at a healthy weight as evidenced by a BMI above 30. Lifestyle modification remains a critical component prior to beginning and while on statin therapy and should be continually assessed (Stone et al., 2014). Unfortunately, changing lifestyle habits is a perplexing problem for all healthcare providers. Although approximately 60% of obese Americans are able to lose 5-10% of their body weight, only around 5% are able to maintain the weight loss long-term (Nicklas, Huskey, Davis, & Wee, 2012). Providers have a level of inertia when discussing this because there is difficulty with patient motivation and there are not distinct therapies to prescribe.

Barriers to Implementation

Barriers to implementation among providers include lack of knowledge about the latest recommendations, disagreeing with the core content, complexity of the guideline, and lack of time (Martin et al., 2015; Parker et al., 2008). A study by Parker et al. (2008), determined that

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

some providers felt they were so busy taking care of patients, they did not have much time for reading journals and keeping up with the latest evidence. However, the clinic in which this project was conducted is a resident training clinic associated with an academic facility and therefore should be well versed on the most recent guidelines. Others felt the recommendations were not easy to use because of the complexity of the guideline. Finally, it may be that providers feel that in a fifteen to twenty minute appointment, they do not have time to discuss all necessary elements and address only the most critical issues (Parker et al., 2008).

The use of the ASCVD risk estimator has not been universally adopted in clinical practices. The choice to use a risk assessment tool depended on how the use of it impacted workflow and whether the tool had credibility (Voruganti, O'Brien, Straus, McLaughlin, & Grunfeld, 2015). A common theme among providers was that integrating a risk assessment tool into the electronic medical record would allow the tool to be easily accessible. This would also serve as a reminder to providers to calculate a risk score. Using a risk assessment tool can be beneficial in initiating discussion about how lifestyle choices can increase risk, especially in the case of smoking (Voruganti et al., 2015). In the current practice setting, this might be a consideration to improve calculating the ASCVD risk score, thereby improving appropriate statin dosing.

Limitations

One limitation of this study is that the retrospective chart review was performed at one primary clinic; therefore the findings cannot be generalized to a larger population. Another limitation is the lack of ethnic diversity among the sample. The third limitation is the failure of the electronic medical record (EMR). Because the EMR did not date back beyond three years to the start of therapy for all patients, normal lipid levels, resulting from statin therapy working,

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

were calculated in the Pooled Cohort Equation as no statin indicated and therefore categorized as not appropriate therapy.

According to Stone et al. (2014), 10-year ASCVD risk is to be calculated in individuals without clinical ASCVD every four to six years. For this study, a risk score was calculated for 2015 and 2016 because the EMR did not date back beyond three years. Therefore, providers may have documented a risk score and determined statin treatment in prior visits unable to be seen. If this differed from the principle investigators calculation of risk, the patient was classified as not on appropriate intensity therapy. Lastly, 10-year ASCVD risk was calculated for all patients, including those with clinical ASCVD, even though ASCVD risk is only used in primary prevention (Stone et al., 2014).

Implications for Practice

Despite the limitations of this study, knowledge has been gained. An important recommendation for this clinic is to implement the ASCVD risk calculator into the EMR. Because research has demonstrated increases in accurate intensity statin prescribing with the use of a risk calculator, integrating it into the EMR will serve as a reminder to providers. This will also increase the usability of the calculator into practice because it will be easily accessible.

A person's ASCVD risk can vary slightly depending on which values are entered by the provider. Because of this, integrating it into the EMR can show exactly which values were used to calculate risk. The risk score in the EMR can also serve to start a discussion between clinician and patient as well as allow patients to track their progress by having access to their chart.

Making the guideline algorithm available in the medical record may also help improve statin prescribing in practice. If providers were able to easily access the algorithm for statin prescribing in primary or secondary prevention, they may refer to it regularly to ensure accurate

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

prescribing. Remembering to discuss healthy lifestyle habits is another important concept to take away from this study. Having a hyperlipidemia care plan in the EMR may serve as a reminder to start a discussion. Healthy lifestyle is the foundation of cardiovascular health and should always been encouraged.

Conclusion

Using tools from the 2013 ACC/AHA guideline in practice can help primary care providers educate patients, prescribe statin therapy appropriately, and decrease the risk of cardiovascular disease in patients with hyperlipidemia. Using the algorithms for primary and secondary prevention of cardiovascular disease along with the risk calculator can improve accurate statin prescribing among providers. Integrating the risk calculator and guideline algorithm into the EMR can increase usability and accessibility for providers along with serving as a reminder of the evidence-based recommendations. It will also provide a visual when educating the patient about cardiovascular risk.

Integrating the risk calculator into a specified place in the EMR will allow for better tracking for quality and performance measures in future quality improvement projects. More accurate tracking will be beneficial when evaluating effective interventions to increase hyperlipidemia control. Accurate prescribing of statin medications along with correct management of hyperlipidemia can help to decrease the burden associated with cardiovascular disease providing better quality of life for the people of Kentucky.

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

References

- Barnard, R.J. (1991). Effects of lifestyle modification on serum lipids. *JAMA* 151(7), doi: 10.1001/archinte.1991.00400070141019
- CDC. (2015, March 16). *LDL and HDL: “Bad” and “good” cholesterol*. Retrieved from https://www.cdc.gov/cholesterol/ldl_hdl.htm
- CDC. (2015, March 17). *High cholesterol facts*. Retrieved from <http://www.cdc.gov/cholesterol/facts.htm>
- CDC. (2016, June 13). *Obesity and overweight*. Retrieved from <https://www.cdc.gov/nchs/fastats/obesity-overweight.htm>
- Claas, S.A. & Arnett, D.K. (2016). The role of healthy lifestyle in the primordial prevention of Cardiovascular Disease. *Current Cardiology Reports* 18(56), doi: 10.1007/s11886-016-0728-7
- Cleveland Clinic (2015). *Statin medications and heart disease*. Retrieved from <http://my.clevelandclinic.org/health/articles/statin-medications-heart-disease-heart-health>
- Hinds, A., Lopez, D., Rascati, K., Jokerst, J., & Srinivasa, M. (2016). Adherence to the 2013 blood cholesterol guidelines in patients with diabetes at a PCMH: Comparison of physician only and combination physician/pharmacist visits. *The Diabetes Educator OnlineFirst*. doi: 10.1177/0145721716631431
- Jame, S., Wittenberg, E., Potter, M.B., & Fleischmann, K.E. (2015). The new lipid guidelines: What do primary care clinicians think? *The American Journal of Medicine* 128(8): 914.e5-914.e10.

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

- Kentucky Cabinet for Health and Family Services (2015). *Heart disease and stroke prevention program*. Retrieved from <http://chfs.ky.gov/NR/rdonlyres/738A1FCB-4F89-4C25-A6E1-548D3E36BE29/0/KentuckyCardiovascularFactSheet2010.pdf>
- Kentucky Department for Family Health (2008). *Prevalence of smoking (percent adults) 2013-2015*. Retrieved from <http://www.kentuckyhealthfacts.org/data/topic/show.aspx?ind=6>
- Last, A.R., Ference, J.D., & Menzel, E.R. (2017). Hyperlipidemia: Drugs for Cardiovascular risk reduction in adults. *American Family Physician* 95(2): 78-87.
- Martin, S.S., Sperling, L.S., Blaha, M.J., Wilson, P., Gluckman, T.J., Blumenthal, R.S., & Stone, N.J. (2015). Clinician-patient risk discussion for atherosclerotic cardiovascular disease prevention: Importance to implementation of the 2013 ACC/AHA Guidelines. *Journal of the American College of Cardiology* 65(13), doi: 10.1016/j.jacc.2015.01.043
- McKibben, R.A., Al Rifai, M., Mathews, L.M., & Michos, E.D. (2016). Primary prevention of Atherosclerotic Cardiovascular Disease in women. *Current Cardiovascular Risk Report* 10. doi:10.1007/s12170-015-0480-3
- Mozaffarian, D., Benjamin, E., Go, A., Arnett, D., Blaha, M., Cushman, M...& Turner, M. (2015). Heart disease and stroke statistics – At a glance. *Circulation*. doi: 10.1161/CIR.0000000000000152
- National Heart, Lung, and Blood Institute. (2001, May). *ATP III at-a-glance: Quick desk reference*. Retrieved from <https://www.nhlbi.nih.gov/health-pro/guidelines/current/cholesterol-guidelines/quick-desk-reference-html>

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

- Newsome, L.C. (2014). Primary prevention of atherosclerotic cardiovascular disease: Controversies and clinical considerations. *Annals of Pharmacotherapy* 49(4), doi: 10.1177/1060028014564181
- Nicklas, J.M., Huskey, K.W., Davis, R.B., Wee, C.C. (2012). Successful weight loss among obese U.S. adults. *American Journal of Preventive Medicine* 42(5), doi:10.1016/j.amepre.2012.01.005
- O’Riordan, M., (2013). *New cholesterol guidelines abandon LDL targets*. Retrieved from <http://www.medscape.com/viewarticle/814152>
- Parker, D.R., Gramling, R., Goldman, R.E., Eaton, C.B., Ahern, D., Cover, R.T., & Borkan, J. (2008). Physicians’ perceptions of barriers and facilitators regarding adoption of the national cholesterol education program guidelines. *Preventive Cardiology* 11(1), doi: 10.1111/j.1520-037X.2007.07200.x
- Robinson, J.G. (2014). Starting primary prevention earlier with statins. *The American Journal of Cardiology* 9(1): 1437-1442.
- Sekaran, N.K., Sussman, J.B., Xu, A., & Hayward, R.A. (2013). Providing clinicians with a patient’s 10-year cardiovascular risk improves their statin prescribing: A true experiment using clinical vignettes. *BioMed Central Cardiovascular Disorders* 13(90), doi: 10.1186/1471-2261-13-90
- Stone, N., Robinson, J., Lichtenstein, A., Merz, N., Blum, C., Eckel, R.... & Wilson, P. (2014). 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic

PROVIDER ADHERENCE TO HYPERLIPIDEMIA GUIDELINE

cardiovascular risk in adults. *Journal of the American College of Cardiology* 63(25): 2889-2934.

Voruganti, R.T., O'Brian, M.A., Straus, S.E., McLaughlin, J.R., & Grunfeld, E. (2015). Primary care physicians' perspectives on computer-based health risk assessment tools for chronic diseases: A mixed methods study. *Journal of Innovation in Health Informatics* 22(3), doi: 10.14236/jhi.v22i3.153

World Health Organization, (2012). *World health statistics 2012*. Retrieved from http://www.who.int/gho/publications/world_health_statistics/EN_WHS2012_Part2.pdf?ua=1

Table 1
 2013 ACC/AHA Guideline for Recommended Statin Intensity

Intensity dosing of statin medication		
High-Intensity	Moderate-Intensity	Low-Intensity
Daily dose lowers LDL-C on average, by approximately \geq 50%	Daily dose lowers LDL-C on average, by approximately 30% to < 50%	Daily dose lowers LDL-C on average, by < 30%
Atorvastatin 40-80 mg	Atorvastatin 10-20 mg	Simvastatin 10 mg
Rosuvastatin 20-40 mg	Rosuvastatin 5-10 mg	Pravastatin 10-20 mg
	Simvastatin 20-40 mg	Lovastatin 20 mg
	Pravastatin 40-80 mg	Fluvastatin 20-40 mg
	Lovastatin 40 mg	Pitavastatin 1 mg
	Fluvastatin XL 80 mg	
	Fluvastatin 40 mg BID	
	Pitavastatin 2-4 mg	

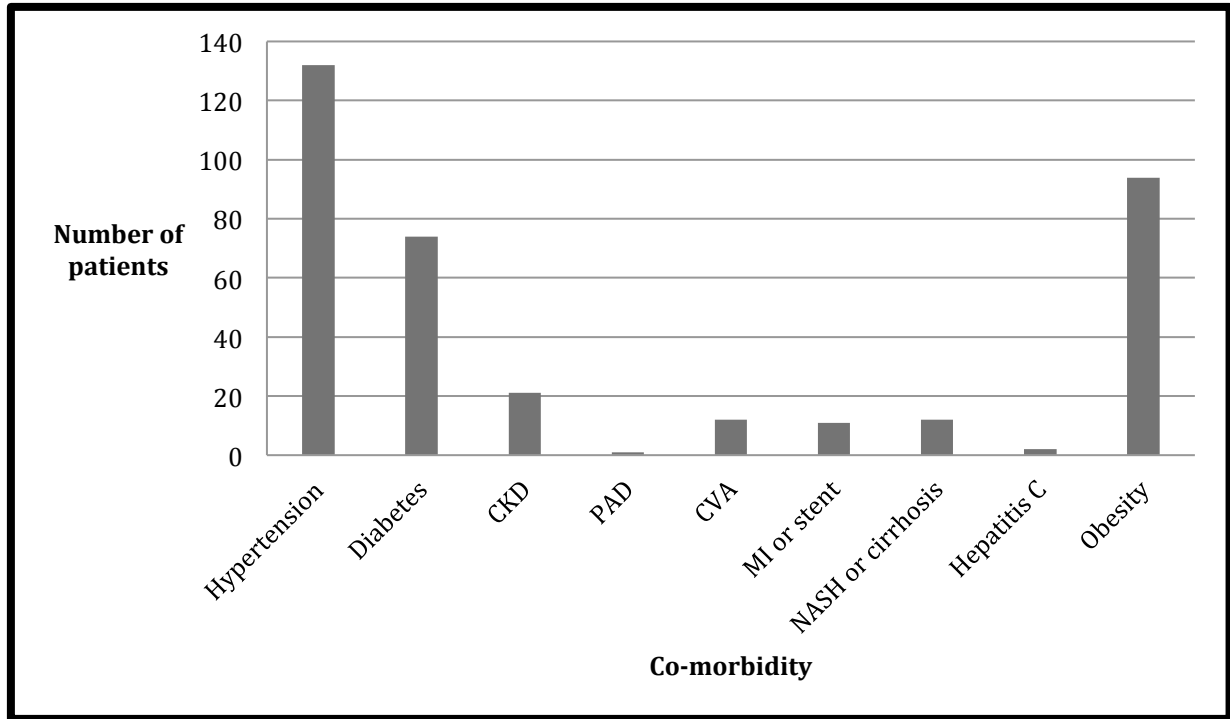
(Stone et al., 2014, p. 25)

Table 2
Demographics and Descriptive Statistics for 2016

	2016 N = 150	2016 Appropriate Statin Therapy
Age		
40-50	23 (15%)	11 (48%)
51-60	53 (35%)	25 (47%)
61-70	54 (36%)	34 (63%)
71-75	20 (13%)	18 (90%)
Gender		
Male	74 (49%)	51 (69%)
Female	76 (51%)	37 (49%)
Race		
White	109 (73%)	64 (59%)
Other	41 (27%)	24 (59%)
Hypertension	132 (88%)	75 (57%)
Diabetes	74 (49%)	40 (54%)
Obesity	94 (63%)	60 (64%)

Table 3
Demographics and Descriptive Statistics for 2015

	2015 N = 138	2015 Appropriate Statin Therapy
Age		
40-50	17 (12%)	6 (35%)
51-60	51 (37%)	21 (41%)
61-70	52 (38%)	32 (62%)
71-75	18 (13%)	14 (78%)
Gender		
Male	68 (49%)	46 (68%)
Female	70 (51%)	27 (39%)
Race		
White	101 (73%)	56 (55%)
Other	37 (27%)	17 (46%)
Hypertension	124 (90%)	64 (52%)
Diabetes	68 (49%)	33 (49%)
Obesity	83 (60%)	47 (57%)



Legend: CKD = Chronic Kidney Disease; PAD = Peripheral Arterial Disease; CVA = Cerebrovascular Accident; MI = Myocardial Infarction; NASH = Non-alcoholic Steatohepatitis

Figure 1: Present Co-morbidities

Appendix A
Chart Audit Tool

Care Team: _____

Gender: _____

Age: _____

Race: _____

Co-morbid conditions:

Condition	Yes	No
Hypertension		
Diabetes Mellitus		
Chronic kidney disease		
Peripheral arterial disease		
Cerebrovascular Accident		
s/p Myocardial Infarction or stent placement		
Nonalcoholic steatohepatitis or cirrhosis		
Hepatitis C		
Obesity		

Current statin medication and dose: _____

How long have they been on the statin: _____

Any dose changes: _____

Was the following documented for the patient with a diagnosis of Hyperlipidemia:

	Yes in 2016	No in 2016	Yes in 2015	No in 2015
Is discussion about healthy diet present?				
Discussion of exercise present?				
Discussion of smoking cessation present if applicable?				
Is the patient currently on the appropriate intensity statin therapy?				
If not on appropriate intensity, is a reason documented?				

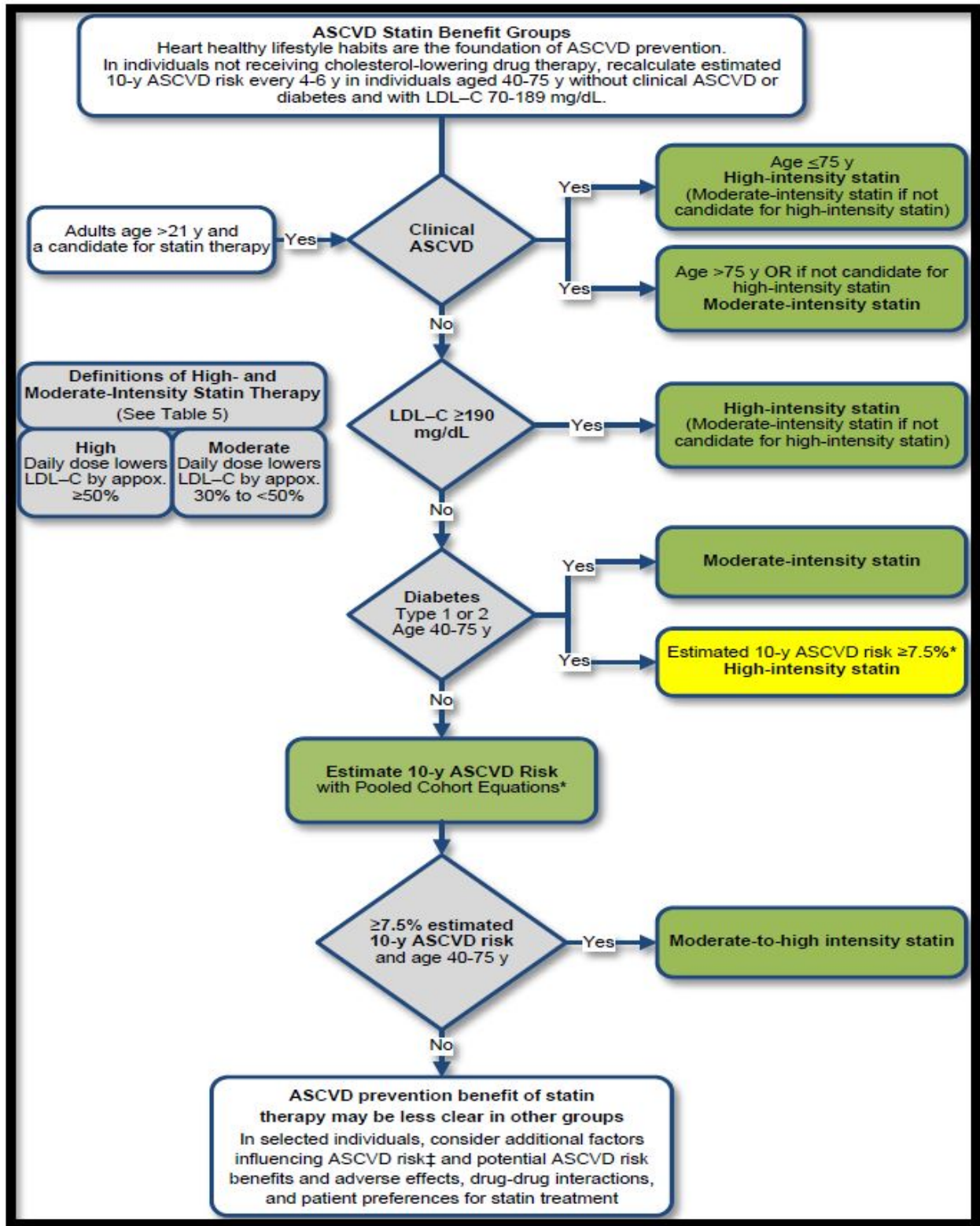
Is there a calculated ASCVD risk charted?				
Does it match PI's calculated ASCVD risk?				

	Yes	No
Were liver enzymes checked prior to initiation of statin therapy?		
Were liver enzymes checked yearly?		
Were yearly lipid panels completed?		
Is the patient prescribed Niacin?		
Is the patient prescribed a bile acid sequestrant (cholestyramine, colestipol, or colesevelam)?		
Is the patient prescribed ezetimibe?		
Is the patient prescribed a Fibrate (fenofibrate or gemfibrozil)?		
Is the patient taking omega-3 fatty acids?		

Calculated ASCVD risk for 2016: _____

Calculated ASCVD risk for 2015: _____

Appendix B Guideline Algorithm



(Stone et al., 2014, p. 15)