

Analysis: High-risk Americans who do not maintain cholesterol targets have 44% higher rate of cardiovascular events

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Higher Cardiovascular Event Rates for High-Risk Americans Who Do Not Meet 2018 Multidisciplinary Guideline on the Management Of Blood Cholesterol

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BACKGROUND

The 2018 Multidisciplinary Guideline on the Management of Blood Cholesterol calls for initiation and intensification of cholesterol lowering therapy if low density lipoprotein cholesterol (LDL-C) exceeds specific thresholds^{**}. Despite LDL-C being a major modifiable cardiac risk factor, most Americans fail to reach below recommended LDL-C thresholds.

This analysis aims to quantify the consequence of failure to reach below recommended LDL-C thresholds by quantifying the impact on cardiovascular events using real world data from the Family Heart Database[™].

METHODS

The Family Heart Database is comprised of diagnostic, procedure and prescription data from claims as well as lab result data for >324 million individuals in the US from 2012 to 2021.

This retrospective analysis assessed annual cardiovascular event rates in a subset of high-risk patients (see definition below) who met the following criteria:

- ≥ 48 month of sufficient diagnosis, procedure, prescription, and lab data
- ≥ 3 cholesterol measures
- AT GOAL^{**} or NOT AT GOAL^{**} for ≥70% of the study (including baseline).

Guideline Defined High-Risk Patients	LDL-C Goal ^{**}
Severe primary hypercholesterolemia (LDL-C ≥190 mg/dL)	<100 mg/dL
ASCVD	<70 mg/dL

Patient histories were divided into contiguous episodes characterized by cholesterol-lowering therapy use (including no therapy, mono and combination therapy), prescriptions filled, and LDL-C level (see Figure 1).

An 18-month baseline period was used to determine the covariates for propensity score matching (PSM). Individuals with a cardiovascular event during the baseline were excluded. Following the baseline period, an observation period of ≥90 months was used to determine the date of the 1st cardiovascular event and annual incidence rates (AIR) were calculated.

^{**} Note – the 2018 Cholesterol Guideline uses the term, “LDL-C threshold.” For clarity and ease of description this term is referred to here as “LDL-C goal” (i.e., a guideline recommended LDL-C threshold of ≥100 mg/dL is referred to here as an LDL-C GOAL of <100 mg/dL).

Real-world data from the Family Heart Database shows that high-risk Americans who consistently fail to reach guideline-recommended LDL-C levels have an annual rate of cardiovascular events that is 44.2% (p<0.0002) higher than those who consistently reach recommended LDL-C levels.

Unfortunately, few high-risk Americans ever reach guideline recommended LDL-C levels, despite the availability of many effective and safe lipid-lowering therapies.

The annual 1st cardiovascular event rate (AIR) in high-risk individuals was:

- 2.2% if “NOT AT GOAL” at least 70% of the time, versus
- 1.5% if “AT GOAL” at least 70% of the time.

RESULTS

The Family Heart Database included 38,110,734 high-risk patients, of whom 39,117 were “NOT AT GOAL” and 17,232 were “AT GOAL” and met all other inclusion criteria. After 1:1 PSM, 14,755 individuals were included in each group. Assessment period (mean ± standard error) was 2,091.58 ± 3.46 days/PSM patient.

See middle panel. First cardiovascular events were 44.2% higher (p<0.0002) in the “NOT AT GOAL” versus “AT GOAL” group (1,879 vs 1,226 first events).

Total cardiovascular events (1st and subsequent) were also 45% higher (p<0.0002) in the “NOT AT GOAL” versus “AT GOAL” group (3,510 vs 2,356 total events).

CONCLUSION AND DISCUSSION


These real-world data demonstrate the consequence of sub-optimal LDL-C management over time. High-risk patients that may be taking cholesterol lowering medications but are consistently above guideline-recommended LDL-C levels over 4 or more years have substantially more cardiovascular events. Greater emphasis on achieving LDL-C control, using widely-available medications and applying current guidelines, would improve cardiovascular health at a population level.

FIGURE 1

Figure 1: All patients are propensity score matched. Representative patients are shown with complex and variable lipid profiles over time, including episodes (represented by colored blocks) that are characterized by LDL-C level and medication use. Periods of time with missing or insufficient data appear as white gaps and are not episodes. LpLDL, lipid lowering therapy

DISCLOSURE INFORMATION

Author Disclosures: none



Lipopterin® → Familial Hypercholesterolemia

Credit: Family Heart Foundation

A real-world, retrospective analysis by the Family Heart Foundation, a leading non-profit research and advocacy organization, found that high-risk Americans who do not maintain levels of LDL-cholesterol (LDL-C)

recommended in the 2018 American College of Cardiology/American Heart Association cholesterol treatment guidelines, had a 44% higher rate of cardiovascular events compared to those who did achieve and maintained recommended LDL-C levels.

The study findings, which were based on data from the Family Heart Database of more than 300 million Americans, will be highlighted this week in a poster presentation at the Academy of Managed Care Pharmacy ([AMCP](#)) Conference at the Henry B. Gonzalez Convention Center in San Antonio.

"This real-world evaluation shows how important it is for people at high risk for cardiovascular events to get the care they need to reach guideline-recommended LDL-C levels and stay there over time," said Cat Davis Ahmed, vice president, Policy and Outreach, and co-author of the study.

"Often that means taking the right statin, sometimes it means taking more than one medication. No matter how a person gets there, this study shows that living in the 'safe zone' when it comes to LDL-C control means fewer cardiovascular events over time. And, understanding and overcoming barriers to LDL-C control at the patient, clinician, payer, and policy levels could improve cardiovascular health at a [population level](#)."

According to the 2018 Multidisciplinary Guideline on the Management of Blood Cholesterol, lipid-lowering therapy (LLT) is recommended if LDL-C levels exceed thresholds in patients who are at high or very high-risk of cardiovascular events. Despite LDL-C being a major modifiable risk factor for [cardiovascular disease](#), most patients do not achieve guideline thresholds and even fewer maintain those levels even if they do achieve them.

The Family Heart Foundation's analysis, titled "Higher cardiovascular

event rates for high or very high-risk Americans who did not meet 2018 Multidisciplinary Guideline on the Management of Blood Cholesterol thresholds," compared high or very high-risk patients who maintained recommended LDL-C levels at least 70% of the time to those who did not and assessed annual cardiovascular event rates. The study included individuals who had at least 48 months of diagnosis, procedure, medication, and lab result data with at least three cholesterol-screening results. Patients were divided into either "AT GOAL" or "NOT AT GOAL" cohorts, with 14,755 in each after 1 to 1 propensity score matching.

Key findings showed:

- The annual rate of first cardiovascular events was 44.2% higher for the "NOT AT GOAL" group (2.2% and 1.5%, p
- Total [cardiovascular events](#) (first and subsequent) were also 49% higher (p

The Family Heart Database is comprised of real-world diagnostic, procedural, and prescription data from claims and/or laboratory information in the U.S. from 2012 to 2021.

The poster will be presented on Thursday, March 23 from 11:30 a.m. to 1 p.m. CDT and will be available for viewing throughout the conference in The EXPO. In addition, the Family Heart Foundation will be hosting a workshop—"Opportunities to Reduce the Rising Tide of Cardiovascular Events through Better LDL-C Management"—in conjunction with the AMCP Conference on Wednesday, March 22 from 12–1 p.m. CDT. The workshop will be moderated by Cat Davis Ahmed, and include Kelly Myers, chief technology officer of the Family Heart Foundation; and Dr. Amit Khera, professor of Medicine and director of the Preventive Cardiology program at UT Southwestern in Dallas.

More information: Research poster: [familyheart.org/high-cardiovas... -high-risk-americans](https://familyheart.org/high-cardiovas...-high-risk-americans)

Provided by Family Heart Foundation

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