# Strategies for Effective Cardiovascular Risk Management Through Lipid Management: A Transitional Approach From Hospital to Home

## AN *AJMC*® ROUNDTABLE DISCUSSION AND WHITE PAPER SPONSORED BY AMGEN

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## INTRODUCTION

On March 30, 2021, a group of cardiologists from leading medical centers across the United States and an executive leader representing a regional health plan convened for a virtual roundtable to discuss effective strategies for advanced lipid management. During the discussion, facilitated by moderator **Jorge Plutzky, MD,** from Brigham and Women's Hospital in Boston, Massachusetts, the experts proposed solutions to salient issues aimed to improve the management of cardiovascular disease (CVD) based on their experiences. This white paper captures actionable insights that were reported during the roundtable, which are summarized in **TABLE 1**.

## CHALLENGES, GAPS, AND UNMET NEEDS IN SECONDARY PREVENTION OF CARDIOVASCULAR EVENTS AND CVD RISK REDUCTION

Clinical atherosclerotic CVD (ASCVD), which includes acute coronary syndrome (ACS), a history of myocardial infarction (MI), stable or unstable angina, coronary or other arterial revascularization, stroke, and transient ischemic attack or peripheral artery disease (all of atherosclerotic origin).[1] All the roundtable attendees acknowledged the clinical and economic burdens associated

### BOX 1. PREVALENCE AND CLINICAL AND ECONOMIC BURDENS OF ASCVD

As of 2018, 126.9 million (49.2%) of adults 20 years or older in the United States have CVD (CHD, HF, stroke, and hypertension).[1] In the United States in 2018, there were 868,662 recorded deaths related to CVD, 655,381 of which were due to heart disease.

Hyperlipidemia is the primary risk factor for the development of ASCVD and, consequently, secondary CV events.[2,3] Clinical ASCVD is associated with an increased risk of secondary CV events and encompasses several conditions, including acute coronary syndrome, a history of MI, stable or unstable angina, coronary or other arterial revascularization, stroke, transient ischemic attack, and peripheral arterial disease including aortic aneurysm, all of atherosclerotic origin.[4]

Individuals with a history of multiple major ASCVD events, or 1 major ASCVD event and multiple high-risk conditions are at very high risk of having another CV event (**TABLE 2**).[4]

In the United States, an estimated 8.8 million individuals experienced an MI between 2015 and 2018, and 108,610 individuals died of an MI in 2018.[1]

From 2016 to 2017, the total annual cost of CVD in the United States was $363.4 billion, making it one of the costliest disease groups and accounting for 13% of total US health expenditures.[1] This figure includes $216 billion in direct costs (physicians and other professionals, prescribed medications, hospital services, and home health care) and $147 billion in indirect costs (lost future productivity and premature CVD mortality).

In comparison, direct costs for cancer, as estimated by the Agency for Healthcare Research and Quality were $105.6 billion during the same period.[1]

ASCVD; atherosclerotic cardiovascular disease; CHD, coronary heart disease; CV, cardiovascular; CVD, cardiovascular disease; HF, heart failure; LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction.

**References: 1.** Virani S, Alonso A, Aparicio HJ, et al. American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics-2021 update: a report from the American Heart Association. *Circulation.* 2021;143(8):e254-e743. doi:10.1161/CIR.0000000000000950 **2.** Ference BA, Ginsberg HN, Ray KK, et al. Low-density lipoproteins cause atherosclerotic cardiovascular disease. 1. Evidence from genetic, epidemiologic, and clinical studies. A consensus statement from the European Atherosclerosis Society Consensus Panel. *Eur Heart J.* 2017;38(32):2459-2472. doi:10.1093/eurheartj/ehx144 **3.** Nordestgaard BG. Triglyceride-rich lipoproteins and atherosclerotic cardiovascular disease: new insights From epidemiology, genetics, and biology. *Circ Res.* 2016;118(4):547-563. doi:10.1161/CIRCRESAHA.115.306249 **4.** Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guidelines on the management of blood cholesterol: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(25):e1046-e1081. doi:10.1161/CIR.0000000000000624

## ROUNDTABLE PARTICIPANTS

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Roundtable participants were compensated for their time.

with ASCVD (**BOX 1**) and identified several critical gaps in the care continuum for the secondary prevention of CV events and reduction of CVD risk where improvement is necessary.

Lipid management is not top of mind for clinicians treating hospitalized patients, and opportunities for inpatient education on cholesterol, low-density lipoprotein cholesterol (LDL-C) goals, and comprehensive reduction of CV events are frequently missed. There is often a lack of effective health care professional (HCP) follow-up of patients post hospitalization, and there are few practical incentives for HCPs in the value-based care model for patients meeting their LDL-C goals.

Statins are underused in patients with established ASCVD, who are at high risk for recurrent CV events; also, nonstatins remain underutilized in appropriate patients (as defined by the latest guidelines).[1-3] Furthermore, quality metrics are not aligned with the latest professional guidelines in cardiology. For an overview of the 2018 multisociety consensus guidelines on blood cholesterol management and use of nonstatin therapies, see **BOX 2**.

### *Missed Opportunities for Inpatient Lipid Management Discussions and Patient-Directed Education*

#### KEY TAKEAWAYS

- Lipid management is not top of mind for clinicians during index hospitalization because of the demanding environment and urgency to address acute issues.
- Patients are rapidly discharged, leading to a lack of lipid management implementation.
- Clinicians frequently miss the opportunity to educate hospitalized patients on cholesterol, LDL-C goals, and comprehensive CV risk reduction.

The faculty agreed that as a consequence of the hectic inpatient environment, lipid management is not at the forefront of attending cardiologists' minds. "There is a lot of pressure to discharge patients quickly, and we are scrambling to make sure all the acute issues are addressed," **Pam Taub, MD,** said. "Because of time limitations, it can be challenging to deploy optimal care that we want."

**Nihar Desai, MD, MPH,** added that from his perspective, shrinking inpatient time frames make it challenging to focus on "aggressive, up-front, intensive LDL lowering," even though there is strong evidence to support this immediate course of action. Results from studies have shown that early aggressive lipid lowering significantly reduces plaque volume in patients with ACS, which is positively correlated with LDL-C reduction percentages.[4,5]

**Dennis Bruemmer, MD, PhD,** said that at Cleveland Clinic, prescribing a high-intensity statin is the initial focus for preventive care in the acute setting for patients experiencing their first CV event who have been treated with no statin or lower-intensity statins before. "That's typically where lipid-lowering therapy in the in-patient setting kind of stops," he said.

There is a "missing sense of urgency," or "clinical inertia" (failure to start therapy or intensify therapy when appropriate)[6] related to

**TABLE 1.** Summary of Expert Insights From the *AJMC*® Roundtable Discussion[a]

| Challenges and gaps | Actionable unmet needs | Improvement opportunities | Improvement strategies |
|---|---|---|---|
| **Missed opportunities for inpatient lipid management discussions and patient-directed education** | • Acute issues prioritized during index hospitalization; lipid management is not top of mind for clinicians<br>• Rapid discharge of patients leads to lack of lipid management implementation<br>• Missed opportunities for in-hospital, patient-directed education on cholesterol, LDL-C goals, and comprehensive CV risk reduction | • Improve lipid management and treatment adherence with patient education<br>• Decision-support and digital health tools, potentially sponsored by and developed in partnership with industry to improve patient outcomes | • Patient education on the importance of LDL-C management, CV risk reduction, and appropriate treatments should begin in the inpatient setting<br>• Digital health tools could be used to deliver patient education |
| **Suboptimal high-intensity statin use and underutilization of nonstatins** | • Improved statin use is needed among patients at high risk for CV events<br>• Additional therapies are not regularly prescribed for patients experiencing events on statin therapy<br>• Limited inpatient use and initiation of PCSK9i are mostly due to formulary restrictions, and PCPs are not comfortable initiating PCSK9i therapy | • Implement care pathways and a multidisciplinary approach to secondary prevention<br>• Decision-support and digital health tools, potentially sponsored and developed in partnership with industry, to improve patient outcomes | • Implement care pathway similar to heart failure in post-CV event scenarios<br>• Integrate pharmacists, APPs, and other HCPs to facilitate treatment protocols and promote patient adherence<br>• Decision-support tools within the EHR may reduce therapeutic inertia and increase HCP comfort with escalation of LDL-C management<br>• Digital health tools could also help to support patient treatment adherence |
| **Gaps in transitions of care and inconsistent follow-up for lipid management** | • Lack of effective postdischarge follow-up care for lipid management | • Streamline the transition to effective outpatient care for lipid management | • Well-written discharge plans and coordinated follow-up appointments with preventive cardiology and cardiac rehabilitation programs help to support optimal therapeutic interventions |
| **Misaligned quality care measures and lack of HCP incentives** | • Few HCP incentives in value-based care model for LDL-C goals<br>• Need for updated quality metrics to align with treatment guidelines | • Improve patient care quality metrics and provide value-based care incentives | • Implement HCP and patient incentives for meeting LDL-C goals in the value-based care model<br>• Align patient care quality metrics (eg, CMS MIPS) with professional guidelines for LDL-C management |

APP, advanced practice professional; CMS, Centers for Medicare & Medicaid Services; CV, cardiovascular; HCP, health care professional; EHR, electronic health record; LDL-C, low-density lipoprotein cholesterol; MIPS, Merit-based Incentive Payment System; PCP, primary care physician; PCSK9i, proprotein convertase subtilisin/kexin type 9 inhibitor.

[a]March 30, 2021 (virtual).

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## BOX 2. OVERVIEW OF UPDATED CONSENSUS GUIDELINES ON BLOOD CHOLESTEROL MANAGEMENT AND USE OF NONSTATIN THERAPIES

In 2018, multiple societies (including the ACC and the AHA) issued updated consensus guidelines on the management of blood cholesterol, which emphasized physician-patient risk discussion and shared decision making.[1]

Recommendations for secondary prevention were categorized according to patient risk level (**Table 2, Table 3**).[1] Statins remain the first-line treatment for hyperlipidemia.

However, some patients at high or very risk who are treated with high-dose statins do not reach their LDL-C targets;[2] furthermore, some patients cannot tolerate statins and may experience adverse effects, such as myalgia.[3]

The guidelines state that, following a clinician-patient discussion about the net benefit, safety, and cost, it is reasonable to consider the addition of nonstatins such as ezetimibe and PCSK9i therapy for patients with very high-risk ASCVD, whose LDL-C remains elevated (≥70 mg/dL) despite maximally tolerated statin therapy.[1]

Ezetimibe (Zetia; Organon) inhibits activity of the sterol transporter, NPC1L1, which is involved in cholesterol and phytosterol absorption in the small intestines.[4] This prevents the absorption of cholesterol in the small intestines and reduces the delivery of intestinal cholesterol to the liver, which reduces hepatic cholesterol stores, and increases the clearance of cholesterol from the blood. For patients with primary hyperlipidemia, ezetimibe is indicated as a monotherapy or as a combination therapy with statins or fenofibrate.

PCSK9 regulates the expression of hepatic LDL-R; it binds to LDL-Rs on the surface of hepatocytes to promote LDL-R degradation within the liver.[5,6] By preventing the binding of PCSK9 to LDL-Rs, a PCSK9i can increase the number of LDL-Rs available to bind and sequester LDL-C, which helps reduce circulating levels of LDL-C.

There are currently 2 PCSK9i therapies that have been approved by the FDA.[5,6] Evolocumab (Repatha; Amgen) is indicated in adult patients with established CVD to reduce the risk of MI, stroke, and coronary revascularization.[5] Alirocumab (Praluent; Regeneron) is indicated to reduce the risk of MI, stroke, and unstable angina requiring hospitalization in adults with established CVD.[6] Evolocumab and alirocumab are also indicated as adjunct to diet, alone or in combination with other LDL-C-lowering therapies, in adults with primary hyperlipidemia, including heterozygous familial HeFH, to reduce LDL-C. PCSK9is, including evolocumab, are not indicated to reduce Lp(a).[5,6]

ACC, American College of Cardiology; AHA, American Heart Association; ASCVD, atherosclerotic cardiovascular disease; CV, cardiovascular; CVD, cardiovascular disease; hypercholesterolemia, HeFH; LDL, low-density lipoprotein; LDL-C, low-density lipoprotein cholesterol; LDL-R, low-density lipoprotein receptor; Lp(a), lipoprotein(a); MI, myocardial infarction; PCSK9, proprotein convertase subtilisin/kexin type 9; PCSK9i; proprotein convertase subtilisin/kexin type 9 inhibitor.

**References: 1.** Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guidelines on the management of blood cholesterol: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2019;139(25):e1046-e1081. doi:10.1161/CIR.0000000000000624 **2.** Boekhold SM, Hovingh GK, Mora S. Very low levels of atherogenic lipoproteins and the risk for cardiovascular events: a meta-analysis of statin trials. *J Am Coll Cardiol*. 2014;64(5):485-94. doi:10.1016/j.jacc.2014.02.615 **3.** Guyton JR, Bays HE, Grundy SM, Jacobson TA, The National Lipid Association Statin Intolerance Panel. An assessment by the Statin Intolerance Panel: 2014 update. *J Clin Lipidol*. 2014;8(3 Suppl):S72-S81. **4.** Zetia. Prescribing information. Organon; 2021. Accessed July 13, 2021. https://www.organon.com/product/usa/pi_circulars/z/zetia/zetia_pi.pdf **5.** Repatha. Prescribing information. Amgen; 2021. Accessed July 13, 2021. https://www.pi.amgen.com/~/media/amgen/repositorysites/pi-amgen-com/repatha/repatha_pi_hcp_english.pdf **6.** Praluent. Prescribing information. Regeneron Pharmaceuticals; 2021. Accessed June 14, 2021. https://www.regeneron.com/downloads/praluent_pi.pdf

starting high-intensity lipid-lowering therapy, Desai said, as well as the expectation that "someone else will deal with that at [the] 7-, or 14-, or 21-day follow-up visit, when that happens."

When discussing the patient's treatment journey that begins in the hospital following a CV event, Plutzky prompted the faculty with the question: "Does that patient go home having heard or written down an LDL number, [and do you] say in follow-up, 'you need to be at this number'? If not, bang on the door, or call me, or get referred to somebody. Did the patient go home with an LDL number in hand?" The general consensus among the faculty was that patient education about cholesterol, LDL-C goals, and comprehensive CV risk reduction was lacking. "Inpatient care tends to focus on acute management and procedures, and the importance of lipid management may not get communicated," **Seth Martin, MD, MHS,** said.

According to **Sunil Rao, MD**, the interventional cardiologist is often the first cardiologist a patient encounters after their first CV event; this presents an ideal opportunity to educate the patient about their condition and initiate discussions about preventive treatment. Instead, discussions with patients typically focus on antiplatelet agents and stent placement rather than lipid management, he said.

## *Suboptimal High-Intensity Statin Use and Underutilization of Nonstatins*

### KEY TAKEAWAYS

- Overall statin use is improving, but more improvement is needed among patients at high risk for CV events.[2]
- Patients who are experiencing CV events while on statin therapy are not regularly prescribed additional therapies.
- Proprotein convertase subtilisin/kexin type 9 inhibitor (PCSK9i) initiation is limited by formulary restrictions in the inpatient setting, and is typically reserved for outpatient settings; however, primary care physicians (PCPs) tend to be uncomfortable with prescribing them.

Despite the overall improvement in high-intensity statin uptake in recent years, high-intensity statin use is still suboptimal for a majority of patients at risk for recurrent CV events, as demonstrated in a study published in 2017 by Rosenson et al, Martin said.[2]

The study to which Martin referred was a retrospective, observational, cohort study using administrative claims from MarketScan, a database that contains health care claims for people with commercial, Medicare supplemental, and Medicaid health insurance, which were obtained through the Truven Health MarketScan Research Database.[2] The study also used administrative claims for Medicare, a governmental health insurance program for adults at least 65 years of age and younger adults with end-stage renal disease or disabilities, which were obtained through the Centers for Medicare & Medicaid Services' (CMS) Chronic Conditions Warehouse that provides data for research purposes.

Results from the study of patients hospitalized with overnight stays for MI between January 1, 2011, and November 30, 2014, have shown that 80% to 90% of patients who filled low- or moderate-intensity statin prescriptions following hospital discharge for an MI did not fill high-intensity statin prescriptions within the subsequent 6 months.[2] Proposed reasons for the lack of switching to high-intensity statins included statin intolerance (which was shown to increase the risk of recurrent MI), clinical inertia, and the presence of comorbid conditions.

Panelists agreed that patients who are already receiving treatment with high-intensity statins when they are admitted for a CV event should be discharged with additional therapy; however, in their experience, most patients were not. In his clinical experience, Bruemmer observed that less patients discharged after a MI, who were previously on high-intensity statins, received adjunctive LDL-C–lowering therapy.

The most recent consensus guidelines on secondary prevention, endorsed and published in 2018 by multiple societies—including the American Heart Association and American College of Cardiology—recommended that patients at very high risk for CV events (**TABLE 2**), whose LDL-C is not adequately managed by maximally tolerated statins, can be prescribed ezetimibe as an add-on therapy.[1] The prescription of a PCSK9i is also reasonable, following a clinician-patient discussion about the net benefit, safety, and cost (**TABLE 3**).[1]

Although there is strong evidence in favor of nonstatins for patients at very high risk for a CV event, data from a retrospective analysis by Karalis et al found that they are underutilized in practice.[3] The study was based on electronic medical record data from Accenture's Predictive Health Intelligence Data on adults with evidence of clinical ASCVD or heterozygous familial hypercholesterolemia from July 28, 2013, to July 26, 2015. Of 368,624 patients eligible for add-on therapy, less than 4% were prescribed ezetimibe, and less than 0.5% received a PCSK9i.

Hospital formulary restrictions can prohibit clinicians from prescribing a PCSK9i to patients. Bruemmer cited this as an impediment to post-CV event therapeutic escalation to a PCSK9i in the inpatient setting. Martin agreed. "When it comes to the class of PCSK9i, that's largely deferred to outpatient clinics," he said.

Another challenge, according to Taub, is that for the treatment of hypertension, PCPs are generally comfortable with dose escalation and addition of multiple agents; however, they are not as comfortable with combination therapies for lipid management (eg, a statin with ezetimibe with or without a PCSK9i).

> **Of 368,624 patients eligible for add-on therapy, less than 4% were prescribed ezetimibe, and less than 0.5% received a PCSK9i.**

**TABLE 2.** Very High-Risk Factors for Future ASCVD Events[1,a]

| Major ASCVD events |
|---|
| Recent ACS (within the past 12 months) |
| History of MI (other than recent ACS event listed above) |
| History of ischemic stroke |
| Symptomatic peripheral arterial disease (history of claudication with ABI < 0.85, or previous revascularization or amputation) |
| **High-risk conditions** |
| Age ≥ 65 years |
| Heterozygous familial hypercholesterolemia |
| History of prior coronary artery bypass surgery or percutaneous coronary intervention outside the major ASCVD event(s) |
| Diabetes mellitus |
| Hypertension |
| CKD (eGFR 15-59 mL/min/1.73 $m^2$) |
| Current smoking |
| Persistently elevated LDL-C (LDL-C ≥ 100 mg/dL despite maximally tolerated statin therapy and ezetimibe) |
| History of congestive HF |

ABI, ankle-brachial index; ACS, acute coronary syndrome; ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; HF, heart failure; LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction.

[a]This definition is from 2018 guidelines endorsed by the American Heart Association, American College of Cardiology, American Association of Cardiovascular and Pulmonary Rehabilitation, American Academy of Physician Assistants, Association of Black Cardiologists, American College of Preventive Medicine, American Diabetes Association, American Geriatrics Society, American Public Health Association, American Society for Preventive Cardiology, National Lipid Association, and Preventive Cardiovascular Nurses Association.

**TABLE 3.** Key Recommendations for Secondary Prevention in Patients With Clinical ASCVD From Multisociety Guidelines on the Management of Blood Cholesterol[1]

| Patient subgroup | Guideline recommendation[a] |
|---|---|
| At very high risk[b] | In patients with clinical ASCVD with LDL-C levels at ≥ 70 mg/dL (≥ 1.8 mmol/L), it is reasonable to add ezetimibe to maximally tolerated statin therapy.<br><br>In patients with clinical ASCVD whose LDL-C level remains ≥ 70 mg/dL despite maximally tolerated statin and ezetimibe therapy, it is reasonable to add a PCSK9i, following clinician-patient discussions about the net benefit, safety, and cost. |
| **Not at very high risk** | |
| Age ≤ 75 years | In patients with clinical ASCVD, high-intensity statin therapy (atorvastatin [40-80 mg daily] or rosuvastatin [20-40 mg daily]) or maximally tolerated statin therapy is recommended to lower LDL-C by at least 50%. |
| Age > 75 years | In patients with clinical ASCVD, for whom high-intensity statins are contraindicated or those who are intolerant to statins, moderate-intensity therapy is recommended to achieve a 30%-49% reduction in LDL-C. |

ASCVD, atherosclerotic cardiovascular disease; HDL, high-density lipoprotein; LDL-C, low-density lipoprotein cholesterol; PCSK9i, proprotein convertase subtilisin/kexin type 9 inhibitor.

[a]These recommendations are from 2018 guidelines endorsed by the American Heart Association, American College of Cardiology, American Association of Cardiovascular and Pulmonary Rehabilitation, American Academy of Physician Assistants, Association of Black Cardiologists, American College of Preventive Medicine, American Diabetes Association, American Geriatrics Society, American Public Health Association, American Society for Preventive Cardiology, National Lipid Association, and Preventive Cardiovascular Nurses Association.

[b]Very high risk includes a history of multiple major ASCVD events or 1 major ASCVD event and multiple high-risk conditions.

According to Plutzky, clinicians in the outpatient setting may encounter a failure to intensify therapy by the inpatient team, leading primary care clinicians to believe no need exists for advancing lipid management and LDL-C control in the outpatient setting. "You're missing that point of educating all the fellows and the residents you're working with," he said. "But the receiving [physician] is getting a message of: 'I don't need to do more than high-intensity statin because those smart doctors at Yale didn't send them home on more.'"

## *Gaps in Transitions of Care and Inconsistent Follow-up for Lipid Management*

### KEY TAKEAWAYS

- Faculty identified that after a CV event, some patients do not receive effective follow-up care for lipid management in an outpatient setting.

The transition of care from the inpatient to outpatient setting is often not seamless. As Plutzky noted, in the United States, most patients are not automatically referred to preventive cardiology or cardiac rehabilitation following a CV event.[7]

At Cleveland Clinic, patients who undergo coronary artery bypass grafting (CABG; commonly known as bypass surgery) usually follow up with a preventive cardiologist within 6 weeks after discharge, Bruemmer said. Patients who come from long distances and follow up with a community practice or a different hospital system may not visit with a preventive cardiologist and are "lost due to fragmentation of care." For this reason, it is "critical" for cardiologists to "set up outpatient or preventive care," Bruemmer added. "It is obviously very important to track these patients and have appropriate metrics in place to capture these patients," he said.

Rao observed that the care of patients who are discharged and return to remote hospitals is not as well managed as that of patients who follow up at a hospital that includes an outpatient referral clinic. "If someone is coming from a remote hospital and they're going back to that facility, and we see them back in a year with a recurrent event, you look and say, 'You're not even on [a] high-intensity statin,'" he said.

### *Misaligned Quality Care Measures and Lack of HCP Incentives*

#### KEY TAKEAWAYS

- The current value-based care model has few HCP incentives in place for patients to reach their LDL-C goals.
- Quality metrics are not aligned with the latest cardiology treatment guidelines.

The faculty said that all their institutions are enrolled in the Merit-based Incentive Payment System (MIPS) launched by CMS, which assigns HCPs and health care systems with "star ratings" and provides reimbursement based on patient experience, access, outcomes, and process measures.[8] However, the metrics used to assess the quality of care in secondary CV prevention are not aligned with the latest professional cardiology guidelines. "On the statin and lipid management side, we're about a decade behind," Desai said.

**Steven Evans, MD**, and Desai agreed that by assigning ratings and providing reimbursement on the basis of process measures (such as whether patients are prescribed statins), instead of relevant outcome measures (such as whether patients are reaching their LDL-C goals), leaves little incentive for HCPs or health care systems to consistently comply with the guidelines and/or increase the initiation of nonstatins among eligible patients. According to Evans, his organization had previously set a secondary prevention measure for PCPs, based on the percentage of patients who reach their LDL-C goals post MI, but it was later abandoned because actual LDL-C goal attainment was perceived to be more the responsibility of the cardiologists for patients who are high risk.

## OPPORTUNITIES AND STRATEGIES TO ENHANCE THE CVD CARE CONTINUUM

To overcome the challenges, bridge the gaps, and fulfill the unmet needs in CVD secondary prevention and risk reduction, the roundtable faculty discussed a variety of opportunities and strategies that could be implemented throughout the cardiovascular care continuum.

The faculty discussed setting up functional care pathways and treatment protocols based on the latest professional guidelines in cardiology, to improve lipid management in the post-ACS setting. They recommended well-written discharge plans and the facilitation of follow-up appointments with preventive cardiology and cardiac rehabilitation programs to support optimal therapeutic interventions. Furthermore, they identified a need for patient education in the hospital setting. Faculty provided insights on the value of integrating pharmacists, advanced practice professionals (APPs)—such as nurse practitioners (NPs) and physician assistants (PAs)—and other HCPs to help facilitate treatment protocols based on the latest guidelines and ensuring patient adherence to treatment. They also recommended aligning care quality metrics with treatment guidelines and providing incentives to both HCPs and patients for reaching LDL-C goals.

Lastly, the experts discussed how decision-support tools within the therapeutic record could help to reduce therapeutic inertia and increase HCP comfort with escalation of LDL-C management. In addition, digital health tools could be utilized to deliver patient education and support treatment adherence. Health care systems could potentially partner with industry to sponsor and develop these tools.

### *Improve Lipid Management and Treatment Adherence With Patient Education*

#### KEY TAKEAWAYS

- Patient education on the importance of LDL-C management, CV risk reduction, and appropriate treatments should begin in the inpatient setting.

The faculty discussed how early patient education about LDL-C treatment in the acute post-MI inpatient setting at the time of prescribing therapy can help to inform patients and make them more likely to adhere to their treatment plan. "Patients want to know 2 things," Rao said. "Why did this happened, and how do I prevent this from happening again. Taking on an approach that is centered on preventing events from the time that the patient interacts with the health care system for the first time, all the way through [to] discharge, is really important."

Patient-directed education in hospitals is not "done as systematically as it needs to be," Desai agreed. "It's a moment to at least start to convey some of the important facts about statins, LDL, and lipid-lowering and to counter some of the misperceptions that are quite prevalent in the community around LDL, statins, and cholesterol," he said.

According to Taub, patients hospitalized for MI in her hospital system, the University of California San Diego (UCSD), are given

> "The one thing we should do, at a minimum, is document in our discharge summary a plan around lipids and secondary risk factor modification that we want to achieve."

access to educational videos, engage in discussions on the importance of LDL-C, have their LDL-C goals and potential therapies explained, and are presented with topics that they should discuss with their doctor. She suggested that health systems encourage patients to watch these educational videos before they are discharged so patients know what to ask during their follow-up clinic visit. "I think you have to prime them, because if you don't, you've lost the opportunity," she said.

### *Streamline the Transition to Effective Outpatient Care for Lipid Management*

#### KEY TAKEAWAYS

- Well-written discharge plans and coordinated follow-up appointments with preventive cardiology and cardiac rehabilitation programs help to support optimal therapeutic interventions.

The faculty agreed that initiating post-MI referrals, writing detailed and actionable discharge plans, and facilitating follow-up appointments with preventive cardiology and cardiac rehabilitation programs are important for optimal secondary prevention.

"The one thing we should do, at a minimum, is document in our discharge summary a plan around lipids and secondary risk factor modification that we want to achieve," Desai recommended. Ideally, he added, "we want patients to follow up in our system with someone from our group. If they can't, then it's important to establish benchmarks and goals for the treating physician to use for patients for the next 4 to 8 weeks and…educate them early on." This is particularly necessary for patients who are not expected to follow up at the same hospital to which they were admitted for their CV event, Rao noted. "We need better follow-up plans for patients who are not going to be seen at our centers," he said. "Larger hospitals should go to smaller centers and provide guidance about secondary prevention; that was a huge gap [in the continuum of care]."

Taub mentioned that at UCSD, patients are automatically referred through the electronic medical record to cardiac rehabilitation after a first or recurrent CV event. Patients enrolled in a cardiac rehabilitation program are more likely to receive intensive secondary prevention and risk modification, she said. "I think the primary care physician is critical, in terms of long-term follow-up, but the initial follow-up post event really falls on cardiology," she said.

The panelists agreed it was important to set up follow-up appointments with preventive cardiology after a patient's first CV event. In their experience, preventive cardiologists are typically more comfortable prescribing nonstatins than PCPs and general cardiologists. A preventive cardiologist might also order advanced lipid tests in addition to a standard lipid profile, if necessary, to guide certain clinical decisions.

General cardiologists typically focus on statin therapy, Bruemmer said. For patients who follow up with him in preventive cardiology post CABG, Bruemmer orders a nonfasting lipid panel, then follows up within 6 weeks. Therapy is adjusted, as needed, until the patient reaches the desired LDL-C goal. "Our main focus is first a high-intensity statin therapy followed by a PCSK9 inhibitor in high-risk patients unable to achieve their LDL cholesterol goal, which is slightly different from the guidelines, but is based on PCSK9 inhibitor efficacy data to lower LDL cholesterol and reduce the risk of another MI or stroke for patients who are at risk for these events," he said.[1,9-11] "It's not just making sure the patient is on a statin; it's targeting the right cocktail of medications to get to a target."

Taub said that elevated Lp(a) levels are a factor in her lipid management approach. She added that on the rare occasions that insurers have denied coverage for Lp(a) testing, she obtained approval by referring to and sending a copy of the 2019 National Lipid Association Scientific Statement.[12] Per the statement, the measure of Lp(a) is reasonable in adults with premature ASCVD (< 55 years of age in men and < 65 years of age in women) and/or recurrent or progressive ASCVD, despite optimal lipid lowering. In patients with elevated Lp(a), she is more aggressive in LDL-C lowering.

### *Implement Care Pathways and a Multidisciplinary Approach to Secondary Prevention*

#### KEY TAKEAWAYS

- A care pathway, like those implemented for patients with heart failure, may be beneficial post CV event scenarios.
- The integration of pharmacists, APPs, and other HCPs can help to facilitate treatment protocols based on established guidelines and promote patient adherence to treatment.

According to Desai, the Yale School of Medicine invested in disease management programs to implement guideline-directed medical therapies for heart failure, such as the initiation of angiotensin-converting enzyme inhibitors and renin-angiotensin system blockers. He suggested that similar programs could be applied to broader patient populations to facilitate secondary prevention of CV events, enable risk modification for patients at high risk for recurrent CV events, and address the underutilization of LDL-C–lowering therapies.

The panelists also discussed why they believe multidisciplinary care teams comprising cardiologists, PCPs, pharmacists, and APPs are important for any successful secondary prevention initiative or program. According to Taub, all patients admitted to UCSD are required to have a discharge clinic appointment, which is usually staffed by an NP or a PA. "I think that person is probably the most critical part of the discharge team because they are excellent in assessing postdischarge issues and adjusting medications," she said. "If the patient is complicated, they'll get them in to see their cardiologist."

Similar to Taub's experience at UCSD, Rao said that at his institution, APPs conduct post-MI follow-up visits with patients. In his opinion, this approach is successful because once APPs are trained about treatment guidelines, cardiologists can trust the APPs to consistently implement them. "Cardiologists, we think a little bit too much and we want to try all these crazy combinations without doing the fundamentals first sometimes," he observed.

The faculty unanimously supported expanding the role of pharmacists in patient care. Pharmacist participation while doing rounds in an inpatient setting is "super helpful," Martin said, and he supported their increased presence in outpatient settings. However, throughout most of Maryland, pharmacist outpatient clinical involvement is limited to areas, such as the anticoagulation clinic and heart failure bridge clinic. "My hope is that in the future, the pharmacist will be more involved in lipid [titration], as well as other preventive medication titration," he said.

Bruemmer said Cleveland Clinic has pharmacists involved in certain dedicated areas, such as the heart failure clinic for health medication titration and the diabetes clinic for escalation to SGLT2 inhibitors.

As a cardiologist in Massachusetts, where pharmacists are authorized to prescribe medication, Plutzky said pharmacists have been very helpful in terms of ensuring the implementation of treatment plans and patient adherence. However, even in states where pharmacists cannot prescribe, he said, they can still provide valuable assistance with obtaining prior authorizations for medications such as PCSK9i.

Martin spoke about a pharmacist at Johns Hopkins' specialty pharmacy, who has been very helpful with educating patients who have been newly prescribed a PCSK9i. This pharmacist provides advice to patients who have concerns about their therapy and helps to assess whether their reported adverse effects are treatment-related. This pharmacist support helps patients adhere to their treatment. Pharmacists also excel at managing drug-drug interactions, Taub added. She cited that supporting evidence generated across several studies at sites with pharmacist involvement has been marked by improved outcomes.[13-15]

### *Update Patient Care Quality Metrics and Provide Value-Based Care Incentives*

#### KEY TAKEAWAYS

- Implementing HCP and patient incentives for reaching LDL-C goals into the value-based care model could help to improve patient outcomes.
- Patient care quality metrics (eg, CMS' MIPS) should be updated to be aligned with professional treatment guidelines for LDL-C management.

In the context of value-based care, participants discussed potential opportunities to incentivize HCPs and patients to reach LDL-C goals. Taub suggested that payers could motivate patients to adhere to treatment by providing them with incentives if they meet prespecified treatment goals. "The payer could give the patient an incentive, such as a decreased co-pay, for getting their LDL to a certain level," she said.

Evans said that his organization attempts to tie provider incentives to guideline adherence and other quality measures. Medicare

organizations adhere to Star Ratings performance standards. Because these standards are often tied closely to Healthcare Effectiveness Data and Information Set scores, the incentives for guideline adherence often correlate with these standards. "We have definitely met adherence measures because of this," he said.

Participants noted that to put incentives in place that drive improved care and better outcomes for patients, quality metrics in the current value-based programs must be updated in alignment with current guideline recommendations for LDL-C-lowering and CV risk reduction treatment. Evans advocated for the adoption of reaching LDL-C goals as a quality measure. "It will not only get the PCPs to do the right thing but also get the PCP to call the cardiologist and say, 'For this patient, I have tried everything I can, and nothing seems to be working. What are your recommendations for my patient to reach goal safely?'"

Professional societies should be advocating for updated quality measures that closely align with their guidelines, which are based on the latest cardiology research and are related to adjunct lipid-lowering and other secondary prevention metrics, Desai advised. Once the appropriate performance measures are set, he added, hospitals will need to invest in proper infrastructure to support those measures. Administrative claims should capture reliable high-quality measurements. These incentives, coupled with strong infrastructure, will drive behavior change.

As a "classic example of a success story," Desai explained that hospitals were incentivized to comply with guidelines that recommended reducing door-to-balloon time in patients with ST-elevation myocardial infarction (STEMI).[16] Door-to-balloon time refers to the period between when a patient experiencing a STEMI arrives at a hospital to receive a primary percutaneous coronary intervention for reperfusion and when the procedure actually takes place. Research has linked door-to-balloon time of less than 90 minutes to improved survival outcomes.

"Hospitals responded by creating an infrastructure that facilitated meeting these goals," Desai said. "It was so successful; CMS doesn't even care anymore, because everybody's a leader." He expressed that a similar investment and focus—arguably as important as door-to-balloon time—will be needed to reduce recurrent CV events.

> **Professional societies should be advocating for updated quality measures that closely align with their guidelines, which are based on the latest cardiology research and are related to adjunct lipid-lowering and other secondary prevention metrics.**

## *Develop Decision-Support and Digital Health Tools for Improving Patient Outcomes*

### KEY TAKEAWAYS

- Decision-support tools within the electronic health record (EHR) may reduce therapeutic inertia and increase HCP comfort with escalation of LDL-C management.
- Digital health tools could help to deliver patient education and support treatment adherence.
- These tools could potentially be sponsored by and developed in partnership with industry.

During the discussion about how to support population health initiatives, reduce clinical inertia, increase HCP comfort with escalation of LDL-C management, and improve patient education and treatment adherence, the faculty shared their experiences in partnering with technology and pharmaceutical companies to develop digital health tools.

According to the FDA, digital health care tools—such as mobile medical applications and software that support clinical decision-making, wearable devices, telehealth, and telemedicine—can assist physicians and other stakeholders with reducing inefficiencies, improving health care access, reducing costs, improving health care quality, and personalizing treatment, leading to improved medical outcomes.[17] Patients can also use digital health technologies to manage and track their health- and wellness-related activities.

Evans said that approximately 3 years ago, Intermountain Healthcare Nevada partnered with a third-party vendor to develop an application (app) for remote monitoring of patients in a randomized controlled study. The results have not yet been published; however, Evans provided preliminary data from the study. Each morning during the study period, enrolled patients were required to input data on whether they were experiencing symptoms and whether they needed supplies or oxygen or to speak with NPs. The NPs were available to call the patients, if requested. If patients didn't enter their information for 3 days, the hospital would call the patients to follow up. Because of the costs associated with running and testing the app, patients who did not use the app were removed from study. According to Evans, data from this study showed that use of this app led to a 67% reduction in hospital admissions and a 43% reduction in emergency department visits.

Desai shared a similar experience as part of a clinical trial at Yale to evaluate a decision-support tool using clinical information gathered from the EHR. This trial was sponsored by a pharmaceutical company. The tool uses an ASCVD registry to identify patients at risk and deploy patient navigators to be proactive with treatment, Desai explained. The tool pulls data on patients' LDL-C and triglyceride levels, as well as professional treatment guidelines, and then provides clinicians with suggestions for lipid-lowering therapies. Previous statin use among registered patients is also reported, to inform future treatment decisions. It works like a "sophisticated alert that is embedded in the workflow and can really help with

> HCPs and health systems need to be mindful of socioeconomic factors that affect patient care.

> "We should all be owning secondary risk factor modifications. Everyone has a role to play in this."

decision-making, and that is much warranted," he said. Pragmatic trial initiatives like this trial, shared Desai, could be targeted to PCPs to engage them in secondary risk factor modification, so they feel empowered to deploy cardiologist treatment plans. "We should all be owning secondary risk factor modifications," he added. "Everyone has a role to play in this."

Taub added, "[There are] a lot of home testing kits where you take a drop of blood [and] and you can get an instant LDL result. This could be done via a virtual visit for someone after an MI. It would be nice to see some of the digital health strategies and new technologies that incorporate LDL."

Similarly, Martin said his hospital developed an app, named Corrie, that provides patients who have had a heart attack with education on the importance of taking their medication and managing their blood pressure and cholesterol.[18] "It kind of gets back to what Sunil [Rao] was saying earlier around 'Why did this happen, and now what can I do to prevent it?'" he said. "That's what our app was designed to do, and it was all on the patient's side of things."

## CLOSING THOUGHTS

Additional clinical trial data may motivate clinicians to move away from the current reliance on monotherapy treatment approaches and toward acceptance of combination therapies involving add-on lipid-lowering agents, Taub said. "What I'd like to see in the future is…a better infiltration of this combination strategy to primary care and advanced practitioners, because that's really how we're going to make a dent on LDL," she said.

Desai said that health care systems need to fundamentally reimagine how they engage patients, help them to understand their disease, and execute care plans. In addition, there needs to be a focus on finding people who are falling behind, as well as developing and delivering care that is consistent with evidence-based practices. Furthermore, Desai said that HCPs and health systems need to be mindful of socioeconomic factors that affect patient care. In particular, he said certain online and digital strategies may not be feasible in communities where resources, capabilities, and access to technology are limited. "I think as much as I'm the biggest proponent for EHR tools, digital tools, devices, Apple watches, and every other thing that's out there, I'm very concerned about what the implications of that care system and care model are for all the communities that we serve and all the patients that we're trying to do right by," he said.

The overarching goal of cardiac care needs to be comprehensive, Bruemmer said. All risk factors need to be addressed as a whole, based on the individual needs of the patient; then, care plans can be devised based on and facilitated by available resources, such as new medications and technologies. "I think there are lots of low-hanging fruits for improving care and translating our knowledge into the population," Bruemmer said. ●

## Repatha® (evolocumab) 140 mg/mL injection
## Important Safety Information , continued

- **Adverse Reactions in Primary Hyperlipidemia:** The most common adverse reactions (>5% of patients treated with Repatha® and more frequently than placebo) were: nasopharyngitis, upper respiratory tract infection, influenza, back pain, and injection site reactions.

  From a pool of the 52-week trial and seven 12-week trials: Local injection site reactions occurred in 3.2% and 3.0% of Repatha®-treated and placebo-treated patients, respectively. The most common injection site reactions were erythema, pain, and bruising. Hypersensitivity reactions occurred in 5.1% and 4.7% of Repatha®-treated and placebo-treated patients, respectively. The most common hypersensitivity reactions were rash (1.0% versus 0.5% for Repatha® and placebo, respectively), eczema (0.4% versus 0.2%), erythema (0.4% versus 0.2%), and urticaria (0.4% versus 0.1%).

- **Adverse Reactions in the Cardiovascular Outcomes Trial:** The most common adverse reactions (>5% of patients treated with Repatha® and more frequently than placebo) were: diabetes mellitus (8.8% Repatha®, 8.2% placebo), nasopharyngitis (7.8% Repatha®, 7.4% placebo), and upper respiratory tract infection (5.1% Repatha®, 4.8% placebo).

  Among the 16,676 patients without diabetes mellitus at baseline, the incidence of new-onset diabetes mellitus during the trial was 8.1% in patients treated with Repatha® compared with 7.7% in patients that received placebo.

- **Immunogenicity:** Repatha® is a human monoclonal antibody. As with all therapeutic proteins, there is potential for immunogenicity with Repatha®.

**Please see full Prescribing Information.**

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