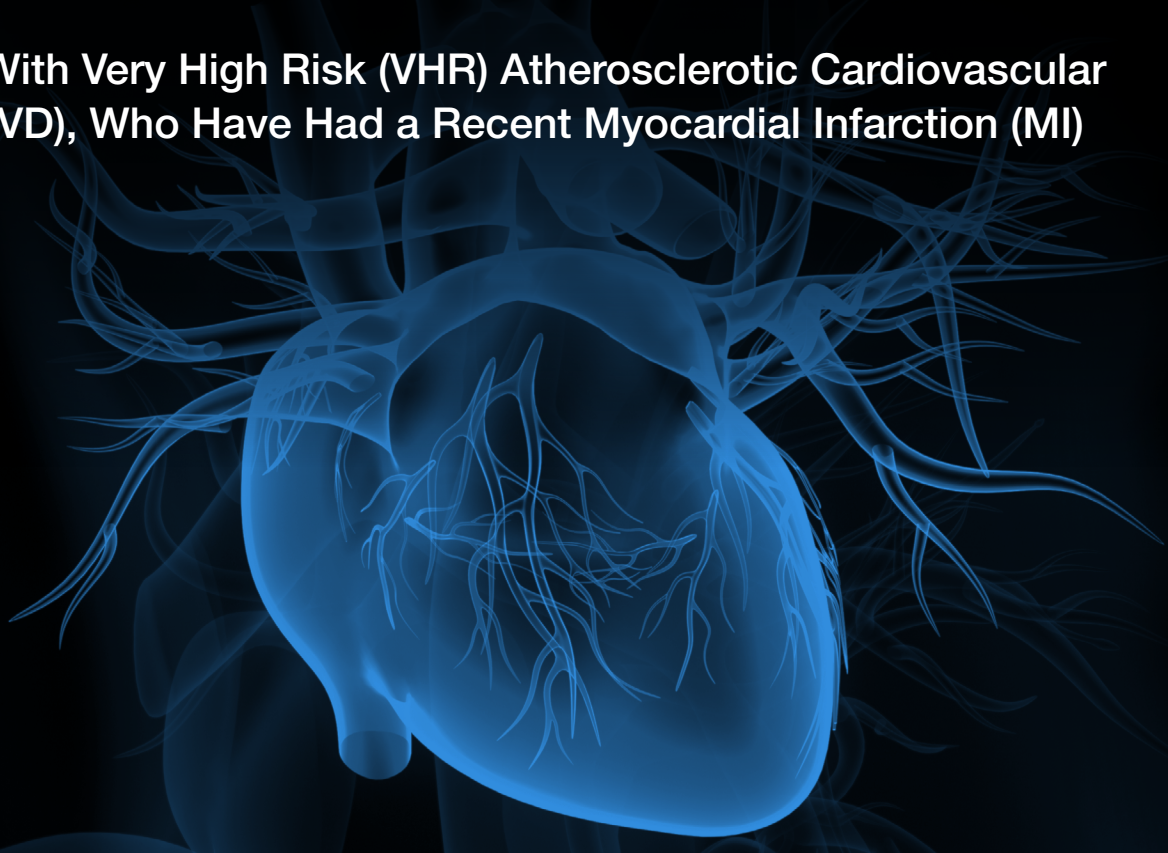


For Health Systems Using Oracle Cerner

## CV RISK MANAGEMENT:

# USING EHR FEATURES TO IDENTIFY, EVALUATE, AND ENGAGE PATIENTS

For Patients With Very High Risk (VHR) Atherosclerotic Cardiovascular Disease (ASCVD), Who Have Had a Recent Myocardial Infarction (MI)



EHR=Electronic Health Record.



### IDENTIFY

Use clinical criteria to generate Patient Reports of patients with VHR ASCVD



### EVALUATE

Use Discern Alerts or Health Maintenance Recommendations to alert providers to consider treatment for patients with VHR ASCVD including a recent MI



### ENGAGE

Use Patient and Primary Care Provider Communications to encourage patients to make appointments and engage in care

# Table of Contents

About This Guide.....	3
CV Risk Management Unmet Need.....	4
Using EHRs to Identify, Evaluate, and Engage Patients.....	8
 Identify: Using Patient Reports.....	10
 Evaluate: Role of Discern Alerts and Health Maintenance Recommendations.....	12
 Engage: Using Patient and Primary Care Provider Communications.....	15
Appendix A: Glossary of Terms.....	19
Appendix B: Dynamic Worklist.....	20
Appendix C: Discern Analytics.....	21
Appendix D: Discern Alerts.....	26
Appendix E: Health Maintenance Recommendations.....	32
Appendix F: Patient Communications.....	38
Appendix G: Primary Care Provider Communications.....	41



## About This Guide

Amgen has developed this EHR guide for educational purposes only, to assist health systems in configuring their Oracle Cerner capabilities to help identify very high risk atherosclerotic cardiovascular disease (VHR ASCVD) patients who have had a myocardial infarction (MI). **Amgen does not endorse specific EHR systems.**

This guide provides **insights and examples to help clinical decision makers implement automated EHR functionalities** that can prompt follow-up for VHR ASCVD patients who have had an MI. It does not constitute guidance for medical advice or treatment.

The information listed in this guide is based upon the most recent version of Oracle Cerner at the time of publication.

*Note:*

- *Functions and features may change as new software versions are released*
- *This guide is meant to serve as summary information only and should not replace detailed instructions provided to you by your internal or external EHR support resources*
- *Screen images shown within represent hypothetical screens in Oracle Cerner*
- *Amgen makes no claims or warranties about the applicability or appropriateness of this information*

See [Appendix A](#) for a Glossary of Terms for Oracle Cerner.





# Millions of Americans Are Estimated to Have VHR ASCVD<sup>1</sup>

US Adults With a History of Major ASCVD Events that Meet the VHR Criteria:<sup>2,\*</sup>



2018 American Heart Association (AHA)/American College of Cardiology (ACC)/Multisociety Definitions of VHR ASCVD<sup>3</sup>

History of Multiple Major ASCVD Events	OR	A Major ASCVD Event and Multiple High-Risk Conditions
<p><b>Major events include:</b></p> <ul style="list-style-type: none"> <li>Recent acute coronary syndrome (ACS), within the past 12 months</li> <li>History of myocardial infarction (MI), other than a recent ACS</li> <li>History of ischemic stroke</li> <li>Symptomatic peripheral arterial disease (PAD)</li> </ul>		<p><b>Conditions include:</b></p> <ul style="list-style-type: none"> <li>Age <math>\geq</math> 65 years</li> <li>Heterozygous familial hypercholesterolemia</li> <li>History of prior coronary artery bypass surgery or percutaneous coronary intervention outside of the major ASCVD event(s)</li> <li>Diabetes mellitus</li> <li>Hypertension</li> <li>Chronic kidney disease (eGFR 15-59 mL/min/1.73 m<sup>2</sup>)</li> <li>Current smoking</li> <li>Persistently elevated low-density lipoprotein cholesterol (LDL-C) <math>\geq</math> 100 mg/dL (<math>\geq</math> 2.6 mmol/L) despite maximally tolerated statin therapy and ezetimibe</li> <li>History of congestive heart failure</li> </ul> <p><i>Note: Please refer to the related EHR Worksheet Resource for potential codes, inclusion and exclusion criteria for your consideration.</i></p>

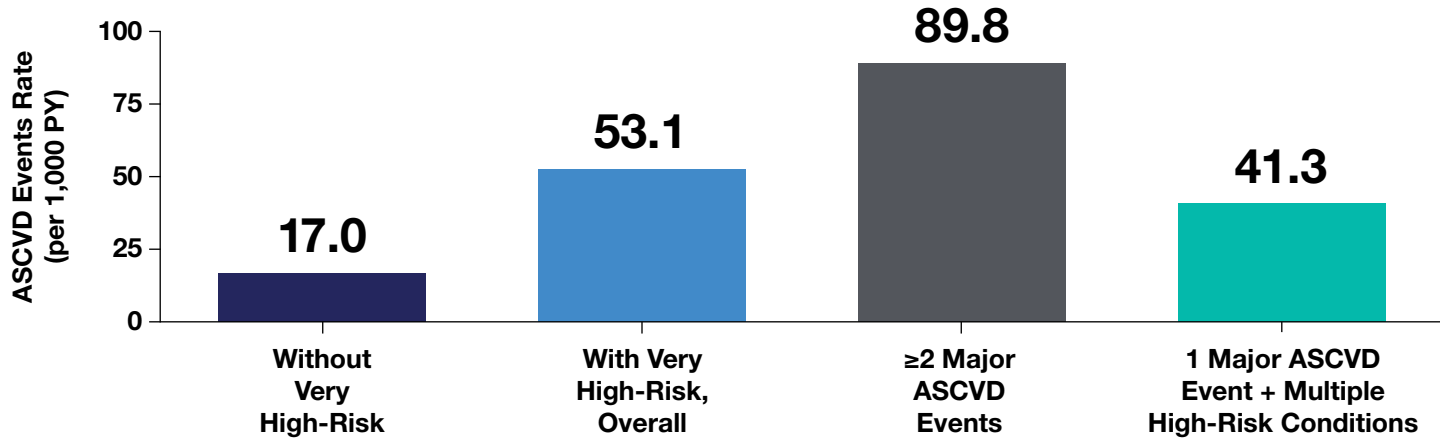
\*A retrospective cohort study of adults using data from the MarketScan database (Truven Health Analytics, IBM Watson Health). Analysis was restricted to patients with a history of major ASCVD on December 31, 2015, defined according to the 2018 ACC/AHA cholesterol guideline as a recent acute coronary syndrome, history of MI other than recent ACS, or history of ischemic stroke or symptomatic PAD. Patients were followed for their first ASCVD event including MI, ischemic stroke, or major adverse limb events with censoring occurring upon loss of health insurance benefits on December 31, 2017.<sup>2</sup>





## Patients With VHR ASCVD Are at Higher Risk for Recurrent CV Events Compared to ASCVD Patients Without VHR<sup>4</sup>

Among Patients With VHR ASCVD, Those With Multiple Major ASCVD Events Had the Highest Risk of Further ASCVD Events<sup>4,\*</sup>



The ASCVD event rate was 3 times higher among those who met the definition of VHR in the 2018 AHA/ACC/Multisociety guideline than for those who did not meet this definition.<sup>4,\*</sup>

\*Analysis of 27,775 US adults with a history of ASCVD from the MarketScan database (Truven Health Analytics, IBM Watson Health). A history of ASCVD was defined as a history of myocardial infarction (MI), stable angina, unstable angina; previous coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI); ischemic stroke, transient ischemic attack, carotid endarterectomy, carotid, vertebral, or basilar stenting; peripheral artery disease (PAD); artery aneurysm, or endovascular stent graft placement. All available claims prior to January 1, 2016, were used to define very high ASCVD risk. Consistent with the 2018 AHA/ACC/Multisociety guideline, a very high ASCVD risk was defined as a history of multiple major ASCVD events or 1 major ASCVD event in addition to multiple high-risk conditions.<sup>4</sup>



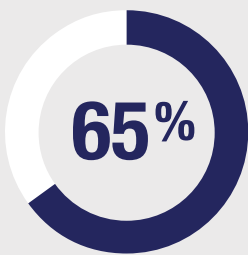


## The 2022 ACC Expert Consensus Decision Pathway Recommends Reducing CV Risk by Optimizing LDL-C Management in VHR ASCVD Patients<sup>5</sup>

- Per recommendations, consider addition of nonstatins to maximally-tolerated statin therapy for VHR ASCVD patients with an LDL-C level above the threshold of LDL-C  $\geq$  55 mg/dL or less than 50% LDL-C reduction<sup>5,\*</sup>

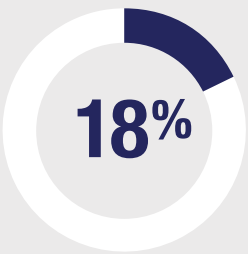
## Though the Relationship Between LDL-C Reduction and CV Risk Management Is Clear, Few Patients With ASCVD Receive Adequate Treatment<sup>6-7</sup>

In an analysis of patient-level data in the Truven MarketScan Research Database:<sup>1,†</sup>

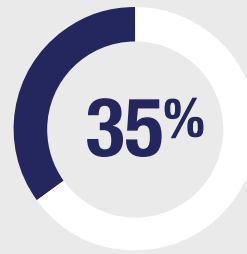


of patients with VHR ASCVD on statin therapy and/or ezetimibe had LDL-C < 55 mg/dL

Among those with VHR ASCVD, at the time of the LDL-C assessment index date:<sup>1,†</sup>



were receiving a high-intensity statin



weren't receiving any statin or ezetimibe

\*Note that this process did not involve formal systematic reviews, grading of evidence, or synthesis of evidence. The goal was to provide practical guidance in situations not covered by the 2018 AHA/ACC/Multisociety guideline until the next round of guidelines has the opportunity to formally review recent scientific evidence.

†Study conducted using de-identified Health Insurance Portability and Accountability Act-compliant administrative healthcare claims from facilities, providers, and outpatient pharmacies from the Truven MarketScan Research Database, which contains healthcare data for more than 43.6 million covered lives. Enrollees who met all of the following criteria were included in the analytic cohort:  $\geq$  1 valid LDL-C measurement in 2014 (date of last measurement defined as index date), age  $\geq$  21 years as of the index date, continuous enrollment in the database for  $\geq$  5 years prior to the index date, a diagnosis of ASCVD or diabetes, or likely heterozygous familial hypercholesterolemia during the baseline period. Demographic and clinical characteristics, including comorbidities and risk factors of interest, were assessed for each disease group, along with treatment status and LDL-C. The extrapolated prevalence of ASCVD was 18.3 million (8.0% of the adult population), of which a total of 32.8% of patients with ASCVD were considered to be at very high risk according to the 2018 Guideline. A patient was assumed to be taking a medication at index if (a) the pharmacy claim date preceded the index date and the runout date was the index date or later, or (b) the pharmacy claim runout date was no later than 30 days prior to the index date. Patients who had either no pharmacy claim or had a pharmacy claim with a runout date earlier than 30 days before index were not considered to be on the medication.<sup>1</sup>

**AMGEN**<sup>®</sup>



## New Strategies May Be Needed to Lower Cardiovascular Risk for Patients With VHR ASCVD

Quality Measures Have Not Kept up With Guidelines and Recommendations for ASCVD Risk



Though clinical guidelines outline LDL-C management criteria to mitigate ASCVD risk, LDL-C levels are not prioritized by current healthcare quality performance measures<sup>2</sup>



Instead, quality performance measures typically focus on activities (eg, statin prescribing) and short-term outcomes (eg, 30-day readmissions) and not longer-term outcomes<sup>8-10</sup>

“The low proportion of patients with a history of major ASCVD events taking a high-intensity statin and ezetimibe **indicates a need for strategies to increase the initiation of, and adherence to, intensive lipid-lowering therapies...**”

– Muntner P et al., *Cardiovasc Drugs Ther* 2021<sup>2</sup>



## EHR Capabilities Can Help Identify Undertreated ASCVD Patients for Follow-Up Evaluation and Engagement<sup>11</sup>

- Population health programs using EHRs can help to successfully identify very high-risk ASCVD patients and significantly improve guideline and recommended LDL-C control<sup>11</sup>
- Given the importance of risk reduction for VHR ASCVD patients who have had an MI, identification of these patients is key<sup>13</sup>

“...the EHR has the potential to automatically identify patients...(of) whom physicians might not otherwise be aware.”

- Roumia M and Steinhubl S, *Curr Cardiol Rep* 2014<sup>12</sup>

## EHR Patient Reports, Discern Alerts, Health Maintenance Recommendations, Automated Patient Communications, and Primary Care Provider Communications May Be Implemented to Help Improve Care for Patients With VHR ASCVD



### IDENTIFY

Use clinical criteria to generate Patient Reports of patients potentially eligible for CV disease management



### EVALUATE

Use Discern Alerts or Health Maintenance Recommendations to alert providers to consider treatment for VHR ASCVD patients who have had an MI



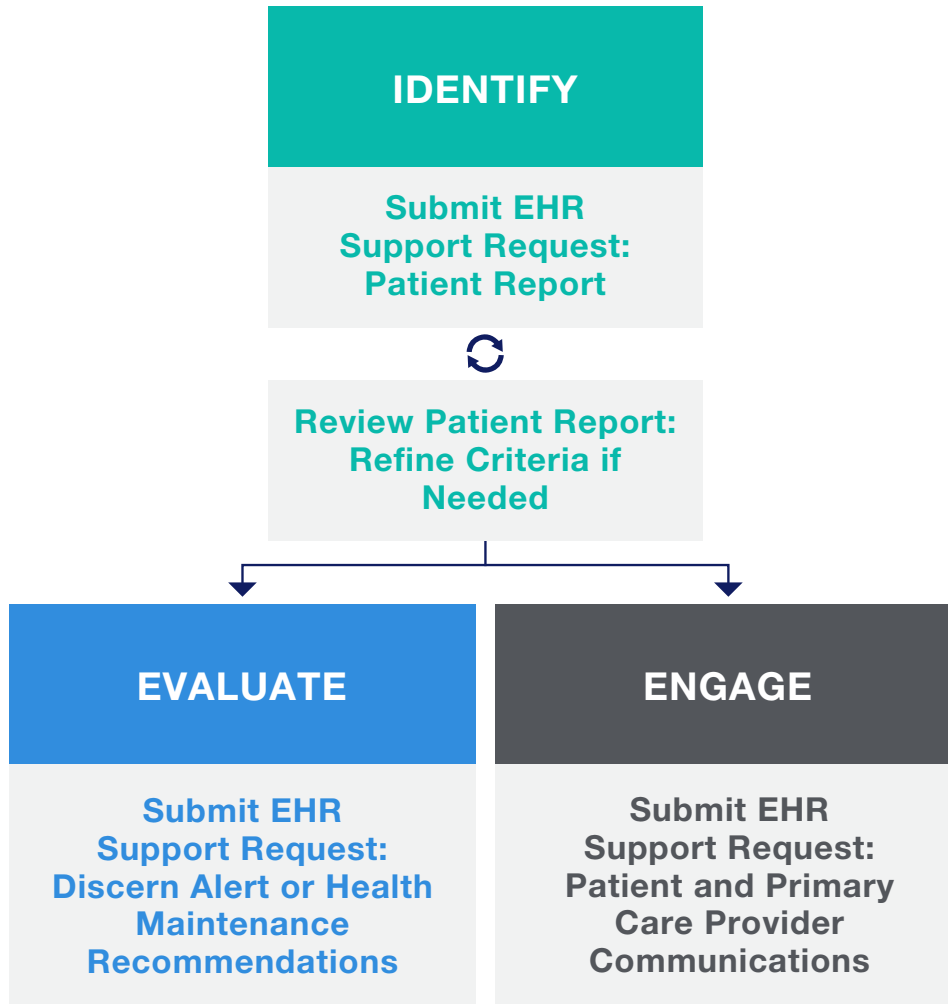
### ENGAGE

Use Patient and Primary Care Provider Communications to encourage patients to make appointments and engage in care





## Actions for a Clinical Champion as Part of the Effort to Help VHR ASCVD Patients Prevent Recurrent CV Events





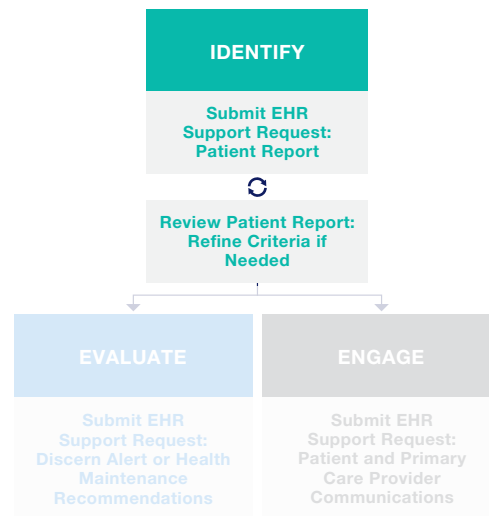
## Role of Patient Reports in Identifying ASCVD Patients

Patient Reports can be used to identify patients with VHR ASCVD after they experience an MI. Once programmed, Patient Reports can be used by organizations to understand which of their patients may benefit from follow-up. Oracle also has reporting features called Dynamic Worklist and Discern Analytics that enable reports with clinical criteria. You can find step-by-step instructions to run a Patient Report with Oracle Cerner's Dynamic Worklist functionality in [Appendix B](#) of this document. Instructions for using Discern Analytics can be found in [Appendix C](#) of this document.

To run a Patient Report, the EHR relies on clinical criteria inputs. These criteria filter the database of patients to display only those you wish to include on the Patient Report.

For example, the criteria in the table below may be used to identify patients with VHR ASCVD.<sup>5</sup> These criteria are listed as examples only. Health systems should independently choose the clinical criteria they deem appropriate to generate the Patient Reports.

*Note: Both Dynamic Worklist and Discern Analytics features require appropriate permissions for access.*



Example clinical criteria for patients with VHR ASCVD who may benefit from the addition of nonstatin therapy <sup>3,5</sup>		
Major ASCVD Event	ICD-10 Diagnosis Code*	Timing
Myocardial infarction (MI)	I21	Any
Acute coronary syndrome (ACS)	I24.0	Within last 12 months
High-risk condition	ICD-10 Diagnosis Code*	Timing
Diabetes	E10 or E11	Current
Hypertension	I10	Current
Laboratory tests	Value	Timing
LDL-C	LDL-C ≥ 55 mg/dL	Past 90 days
	OR Missing fasting or non-fasting lipid panel	Past 12 months
Medications	Type/dose	Timing
Lipid-lowering therapy	High-intensity statin (atorvastatin 40 mg to 80 mg or rosuvastatin 20 mg to 40 mg) ± ezetimibe	At least 1 month
Interventions	Procedure Code*	Timing
Percutaneous coronary intervention	92920	Any

\*Codes are intended to guide provider efforts to identify patients potentially eligible for cardiovascular risk management. They are provided for reference purpose only and may not be all-inclusive. The responsibility to determine coverage and reimbursement parameters, and appropriate coding for a particular patient and/or procedure, is always the responsibility of the provider or physician.



# Requesting and Implementing Patient Reports



## For the Healthcare Provider

### Requesting Patient Reports From the EHR Support Team

Requesting healthcare providers must provide key information for Patient Reports before the setup can be managed by the EHR support team as part of a typical process for requesting, approving, and implementing EHR changes.

The healthcare provider may then update the criteria to refine the results.

### Inclusion and Exclusion Criteria for Patient Reports

*Note: Please refer to the related EHR Worksheet Resource for potential inclusion and exclusion criteria for your consideration.*

Instructions for running a Patient Report in **Dynamic Worklist** can be found in [Appendix B](#) in this document. Instructions for using **Discern Analytics** can be found in [Appendix C](#).



## For the EHR Support Team

In Oracle, a list of patients can be created using **Discern Analytics**, and saved to a folder for on-demand running or scheduling. Dynamic Worklist can be created and run by the user on demand and as needed. Once the Patient Report is implemented, healthcare providers can run the report and assess the results.

Dynamic Worklist							
<span>Details</span>   <span>List Actions</span>   <span>Add Patient</span>   <span>Remove Patient</span>   <span>Generate Communication</span>   <span>Help</span>							
Filters	Patient	Primary Care Provider	Conditions	Payer/Health Plan/Class	Risk	Visits/Timeframe	
Viewing 5573 Total Patients 2788 No longer meet search criteria Age Sex Language Race Associated Providers Care Coordinator Financial Class Health Plan Type Readmission Risk Admission Range Discharge Range Encounter Type Case Status Appointment Status Conditions Laboratory Vital Signs Measurements Risk Stratification	<b>TEST, JOHN 1</b> DOB: 06/10/1952 (67 years) Sex: Male MRN: ●○○○○		Diabetes Hyperlipidemia	HEALTHE/Commercial/Comm... HEALTHE/Commercial/Comm...		1 Inpatient/180 days 1 Outpatient/180 days	
	<b>TEST, JANE 1</b> DOB: 07/08/1978 (41 years) Sex: Female MRN: ○○○○○				Cigna/Commercial/Commerci...		5 Outpatient/180 days
	<b>TEST, JOHN 2</b> DOB: 06/01/2008 (11 years) Sex: Male MRN: ○○○○○			Hyperlipidemia Hypertension Diabetes	HEALTHE/Commercial/Comm...		1 Inpatient/180 days 3 Outpatient/180 days
	<b>TEST, JANE 2</b> DOB: 01/01/1940 (80 years)			Asthma Diabetes	Aetna PPO/Commercial/Comm...		1 Inpatient/180 days 2 Outpatient/180 days

Example of a Dynamic Worklist.





## Role of Discern Alerts and Health Maintenance Recommendations

Discern Alerts are automated alerts displayed at the point of care that remind or flag providers to evaluate treatment when a patient meets specific criteria. For example, a BPA may be configured to notify providers if a patient meets the 2018 AHA/ACC/Multisociety criteria for VHR ASCVD<sup>2</sup> and also may benefit from the recommendations in the 2022 ACC Consensus Pathway.<sup>5</sup> Similarly, Health Maintenance Recommendations may be used in the EHR to remind patients and staff about completed and upcoming preventive health tests and procedures.

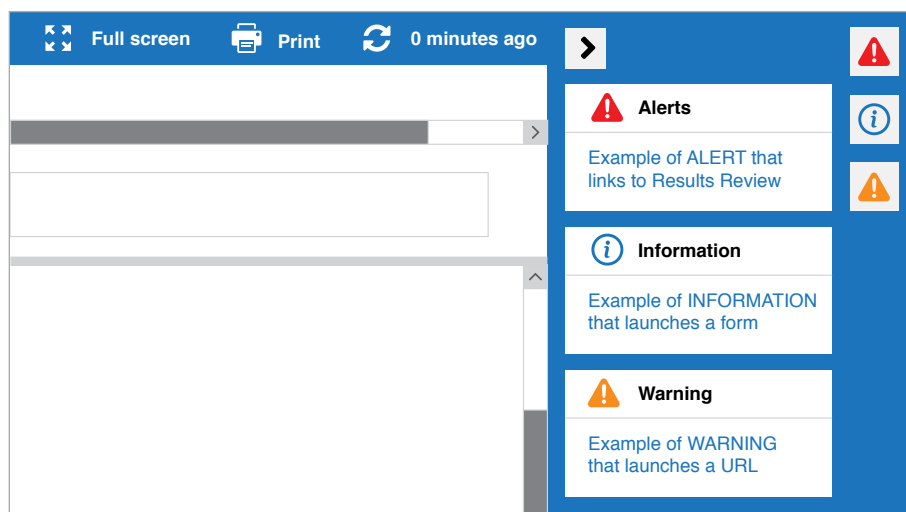
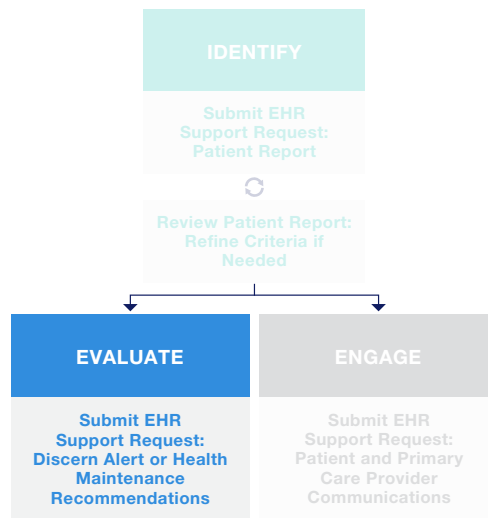
Because they are tied to clinical criteria, Discern Alerts are designed to prompt relevant actions. When patients meet set criteria that identifies them as possibly having VHR ASCVD, the EHR can suggest certain actions, such as medication review, ordering follow-up tests, or creating a referral for the patient. These actions are typically based on best practice care guidelines and are developed in partnership with clinical leadership at the institution.

You can find instructions to create a **Discern Alert** in [Appendix D](#) of this document. Instructions for setting up **Health Maintenance Recommendations** can be found in [Appendix E](#).

### Using SmartZone for Non-Critical Alerts and Referential Patient Information

SmartZone is a passive alerting window that displays non-critical alerts and reminders with less disruption to the workflow. Using a SmartZone to display Discern Alerts in an unobtrusive, yet visible and meaningful way, may help reduce the alert fatigue that results from too many alerts appearing when the patient's chart is opened.

SmartZone can be used to display alerts that do not require immediate action along with patient-specific referential information. SmartZone should not be used for critical or time-sensitive alerts, messages requiring immediate action, or alerts that will be triggered based on an action taken while the patient's chart is open.



Example of SmartZone and Icons.





Discern Alert - Test, Patient

**Risk Factor for Future ASCVD**

**! This ASCVD patient may be at high risk for a future ASCVD event.**

This patient may be at very high risk for future ASCVD Event, according to the 2018 AHA/ACC/Multisociety Guideline.

Alert Action

Order medication       Open a lipid-lowering therapy order set  
 Refer to cardiologist       Order a lipid-panel test

OK

Example of a Discern Alert.

**Add Recommendation**

Utilize Smoking Cessation  
 Select All (0)

VHR ASCVD At Risk  
 Select All (1)

Utilize Cancer Surveillance  
 Select All (0)

Wellness  
 Select All (0)

**Selected**

VHR ASCVD At Risk - VRH ASCVD [Delete Entry](#)

**Recurrence**      **Next Due**

12      months      Date      12/16/2023

**Reason and Comments**

**Reason**

Select

**Comments**

Enter comment here

**Recorded for**

If no user is selected, the current user will be saved

Smith MD, Douglas

Submit (1)      Cancel

Example of a Health Maintenance Recommendation.



# Requesting and Implementing Reminders



## For the Healthcare Provider

Requesting healthcare providers or others in the health system may wish to request Reminders to help ensure follow-up for patients identified on the Patient Reports. Below are some examples of how you may decide to set up your Discern Alerts.

### Inclusion and Exclusion Criteria for Reminders

Please refer to the related EHR Worksheet Resource for potential inclusion and exclusion criteria for your consideration.

### For Discern Alerts Only:

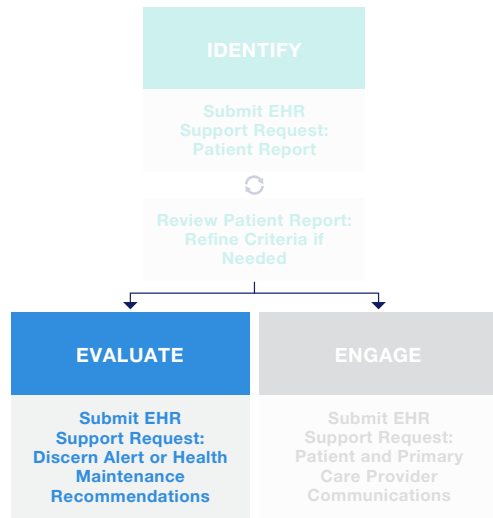
To effectively communicate with EHR support staff when requesting an Alert provide specific details, for example:

**Evoke:** The action(s) which occur within the EHR that initiate the rule logic, such as upon chart open by users in a particular role

**Logic:** The rule criteria to be used in evaluating the data

**Actions:** Displays the options available to the user, for example:

- Open a lipid-lowering therapy order set
- Order a lipid-panel test
- Refer to a cardiologist or lipid clinic

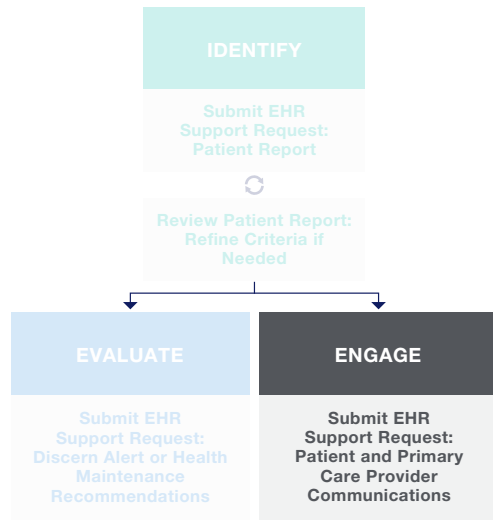




# Role of Patient Communications

Healthcare providers, or others in the health system, may request Patient Communications to communicate with patients identified on the Patient Reports. Patient Communications are letters sent either electronically via the HealthLife® patient portal or by mail to all patients who meet the criteria specified in the EHR. Patient Communications can be used as the basis to proactively contact VHR ASCVD patients who have experienced an MI.

Communications to patients can indicate the reason for follow-up along with a call-to-action, such as to schedule an appointment for evaluation. They can also include supporting educational materials prior to the visit, such as information on ASCVD risk and available treatment options. These communications are then recorded in the patient's chart for reference. You can find step-by-step instructions for creating **Patient Communications** in [Appendix F](#).



Consumer	Name	DOB	Tracking Status	Recommendation Status
<input type="checkbox"/>	Mary Smith	4/6/1949	Qualified for Invitation	
<input checked="" type="checkbox"/>	Donna Jones	3/28/1967	Qualified for Invitation	
<input type="checkbox"/>	Jane Washington	4/23/1969	Qualified for Invitation	
<input type="checkbox"/>	Thelma Lincoln	6/18/1955	Qualified for Invitation	
<input type="checkbox"/>	Flo Truman	6/18/1955	Qualified for Invitation	
<input type="checkbox"/>	Elizabeth Robinson	5/12/1959	Qualified for Invitation	

Example of patients qualifying for recommendation outreach.



# Requesting and Implementing Patient Communications



## For the Healthcare Provider

### Suggested Request to the EHR Support Team: Patient Communications

Similar to the other EHR capabilities, healthcare providers must provide key information for Patient Communications before the setup can be managed by the EHR support team.

#### Inclusion and Exclusion Criteria for Patient Communications

#### Message Configuration

- Subject
- Message body (required field)
- Reply options
- Attachment options

#### Example language:

Hi [[Patient Name]]:

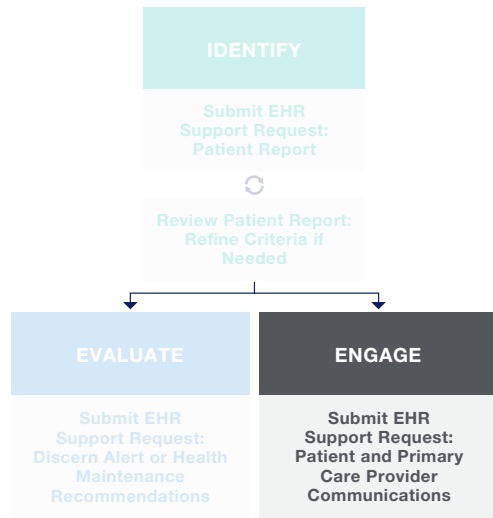
Know your numbers—it's important that your LDL-C is < 55 mg/dL to help manage your risk level. Preventive medicine plays an important part in your health and overall well-being. Given the risk factors and your history of cardiovascular events, you may be at an elevated risk for another event. It's important to schedule an appointment for follow-up evaluation and to discuss your heart health with your physician.

To schedule your appointment, contact your cardiologist or connect via HealthLife patient portal.

Sincerely,

[[Organization Name]]

*Note: Please refer to the related EHR Worksheet Resource for potential inclusion and exclusion criteria for your consideration.*







# Primary Care Provider (PCP) Communications

## Role of PCP Communications

PCP Communications are used to engage and advise the identified patient's Primary Care Provider. For PCPs within the health system, the message can be sent as an Automated Message Center Message. To reach PCPs outside of the health system, messages can be sent electronically as a Direct Message or fax. Much like a referral letter, these communications can be recorded in the patient chart.

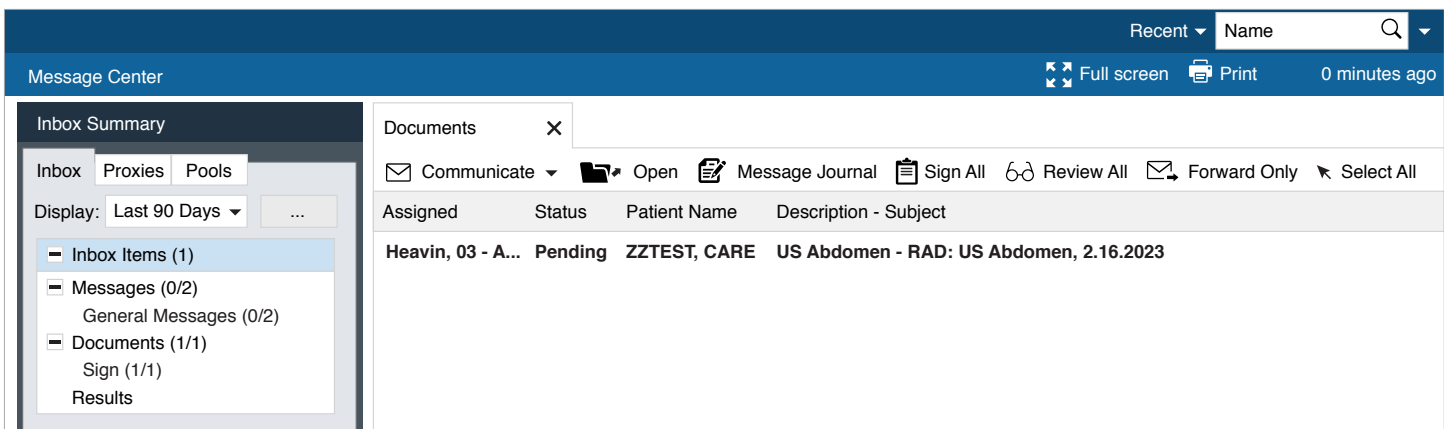
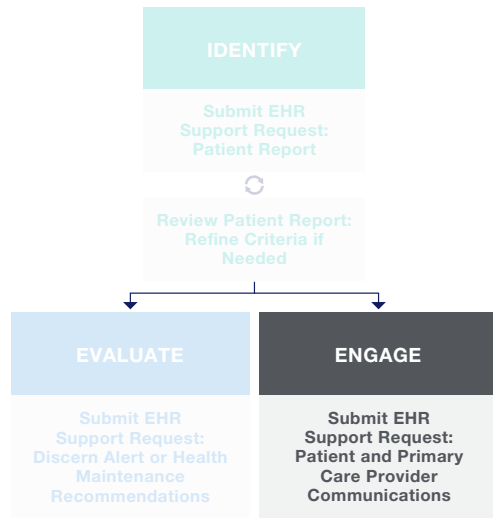
PCP Communications can be used to proactively reach out to the identified patient's PCP as part of an organization's cardiovascular EHR improvement effort. The communication can indicate the reason for follow-up along with a call-to-action, such as to schedule an appointment or to keep providers apprised of changes to the patient's treatment plan. A rule can be defined based on criteria to automatically generate and send a message to the patient's PCP.



## For the Healthcare Provider

### Suggested Request to the EHR Support Team: Primary Care Provider Communications

Similar to the other EHR capabilities, healthcare providers must provide key information for Primary Care Communications before the setup can be managed by the EHR support team.



Example PCP receiving Message Center Message.



## For the EHR Support Team

Refer to [Appendix G](#) for detailed instructions.





## Primary Care Provider (PCP) Communications (cont'd)

### Requesting and Implementing Primary Care Provider Communications

Clinical decision makers may consider providing the following information to their EHR support team for their use in configuring PCP Communications:

- Patients to include
- Methods of communication
- When to send and appropriate qualifier, for example, XX days after change in lipid-lowering therapy
- Message to Primary Care Provider, for example,

[[PCP Name]]:

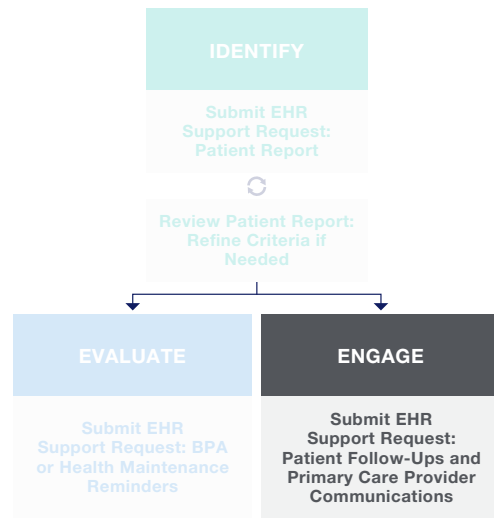
Regarding: [[Patient Name]], [[DOB: DOB]]

We saw your patient on XX/XX/XXXX and initiated a change in lipid-lowering therapy. This change was based on your patient's LDL-C levels on recent laboratory tests. For your review, we have attached pertinent information regarding their care at this facility.

Sincerely,

[[Facility contact information]]

- Attachments, for example, procedure notes or lab results





## Appendix A: Glossary of Terms

EHR Term	Definition
<b>Care Guidelines</b>	The clinical treatment guidelines by which the practice or health system have agreed are best practices to follow. The guidelines are the basis of Discern Alerts and other reminders in the EHR.
<b>Clinical Champion</b>	The person within the practice who is the “go-to” for EHR-related questions. Sometimes this person is also responsible for setup of the EHR.
<b>Discern Alerts</b>	A Cerner-specific term for reminders that display in the EHR for the HCP, based upon the patient meeting certain criteria.
<b>Discern Analytics</b>	Cerner’s Analytics/Reporting tool. Primarily used by EHR support team. Uses a separate reporting database.
<b>Discern Analytics Patient Lists</b>	An EHR reporting feature that enables the creation of a list of patients, based upon demographic or clinical criteria.
<b>Dynamic Worklist</b>	Dynamic Worklist is an individual user level reporting functionality used to identify patients based on many different criteria including conditions, results, orders, appointment types.
<b>EHR Support</b>	The person or group that provides EHR technical support. This group is often responsible for the setup of or changes to the EHR.
<b>Health Maintenance Expectation</b>	A Cerner build tool used to create health maintenance actions such as scheduling dates or preventive screenings that display in a patient’s chart.
<b>HealtheAnalytics</b>	HealtheAnalytics is an reporting application powered by the Cerner population health management platform, HealthIntent, which collects data from multiple sources, normalizes the data, and leverages a single population record for every patient. HealtheAnalytics provides prestructured content around a specific analytic focus that includes key performance indicators (KPIs), reports, and data models.
<b>HealtheLife</b>	Cerner’s name for the patient portal. HealtheLife enables patients to view their clinical record, access After Visit Summaries, securely message with their provider, request appointments, refill prescriptions, and access educational materials.
<b>Inclusion/Exclusion Criteria</b>	Information that is used to determine whether a patient should or should not be included in a report, or whether a Discern Alert should be displayed for patient or not. Criteria include (but are not limited to) diagnosis, gender, age, lab results, medication history, and procedure history.
<b>Invitations</b>	Communication with patients generated from within the EHR using a variety of methods.
<b>My Favorites</b>	Reports that are set up in Discern Analytics can be saved to a list which an EHR user can run on demand. Each user’s list of reports is referred to as My Favorites.



## Appendix B: Dynamic Worklist

Users must have appropriate permissions to access Dynamic Worklist.

### Create the Worklist

1. Open **Dynamic Worklist** from the link on the toolbar
2. From the **List Actions** dropdown menu, select **Create Worklist**.
3. Enter a name for the worklist.
4. Select **Group/Provider** or **Location**.
  - If Group/Provider is selected, search and select a specific provider and relationship type, or a Provider Group
  - If Location is selected, a location and lookback range are required
5. Select **Next** to add criteria for the worklist.
6. Select a criteria filter, for example, **Age**. Choose an operator from the dropdown, then select specific age or age range, for example, older than 65 years.
7. If appropriate, optionally select **Care Coordinators**.
8. To select patients who have multiple risk factors, from the **Conditions** category select the **And** operator, then choose appropriate risk conditions.

*Note: Condition rules are specific to the health system defined by the local IT team.*
9. From the **Results** options select **Lab Results** and select an appropriate **Lookback Range**. If applicable, multiple lab results can be Included.

*Note: For multiple results the OR operation defaults. The AND operator is not selectable until all fields, including the Value and a Lookback Range, have been entered.*
10. From **Medications** search for and select appropriate medications. Use a **Lookback Range** that coordinates with Results lookback.
11. Optionally, select the appropriate **Referral Order Status**.
12. Optionally, select **Health Maintenance** options.
13. Select **Summary** to review the selected options, then select **Finish**. Select **OK** to complete and view the Worklist.



## Appendix C: Discern Analytics

Discern Analytics reports are configured by IT analysts with appropriate access. Criteria for determining patients who are at very high risk for another event are defined as a patient who has had 1 major ASCVD event, plus additional risk factors.

### Creating the Queries

1. With appropriate credentials, launch **Discern Analytics** (DA2.exe). Select the **Navigator** tab, access the **Domain** tab, and select the appropriate domain to query.
2. Right-click on the selected domain, then choose **New Query**.
3. Select the **Query List** tab, highlight **Query1**, and select **Rename**.
4. Name the query according to health system naming conventions, for example, **Major ASCVD Query**. Select **OK**.
5. From the **Query List**, highlight the newly named query, select **Copy**.
6. Highlight the copied query name, then select **Rename**.
7. Repeat **steps 5-6 to create queries for each of the following risk factors**, setting the **Joined Query** field to **No**.



## Appendix C: Discern Analytics (cont'd)

### Selecting Qualifications for Each Query

The table below provides examples of the Qualifications for each query. Subsequent steps are examples of each query build.

Logic Operator	Query	Qualification (Field)	Qualification (Type)	Section Logic	Formula/Values
AND	Major ASCVD	Problems > Problem Code	Filter List	OR	<ul style="list-style-type: none"> <li>Recent ACS</li> <li>History of MI</li> <li>History of Ischemic Stroke</li> <li>Symptomatic PAD</li> </ul>
	Age Query	Person > Demographics > Age-Years	Constant		≥ 65
OR	Smoking Hx Query	(Clinical Events > Clinical Event > Clinical Event Clinical Events > Clinical Event > Clinical Event Result)	Constant	AND	Clinical Event site name for "Tobacco Use" All <appropriate> Valued
		(Clinical Events > Clinical Event > Clinical Event Clinical Events > Clinical Event > Clinical Event Result)	Constant		Clinical Event site name for "Smoking Status" All <appropriate> Valued
	LDL Query	Clinical Events > Clinical Event > Clinical Event	Constant	AND	Clinical Event name for LDL Test
		Clinical Events > Clinical Event > Clinical Event Result	Constant		≥ 55
		Clinical Events > Clinical Event > Performed Date > CD-Performed DT/TM	Filter List		Last 12 Months (for example)
		Clinical Events > Clinical Event > Clinical Event Result Unit)	Filter List		mg/dL
	Statin Query	Orders > Orderable > Order Long Description	Filter List	AND	All applicable statins
		Orders > Order Action > All > Action Order Status	Filter List		All applicable order status types (Ordered, In Process, Active, etc.)
	Diabetes Query	Problems > Problem Code	Filter List		All applicable Type 2 Diabetes Mellitus codes
	Hypertension Query	Problems > Problem Code	Filter List		All applicable Hypertension codes



## Appendix C: Discern Analytics (cont'd)

### Selecting Qualifications – Major ASCVD Query

1. Select the **Major ASCVD Query**. From the qualification filter options, select **Problems, Problem Code**.
2. Select right-arrow to move the selection to the **Qualifications** section.
3. Select **Modify Filter List**.
4. Search for and move appropriate Problem Codes for the conditions that define Major ASCVD event patients to the right-hand list.
5. Select **Include** when done.

### Selecting Qualifications – Age Query

1. Select the **Age Query**.
2. From the qualification filter options, select **Person, Demographics, Age – Years** to the **Qualifications** section
3. From the **Qualification Type** type dropdown, select **Constant**.
4. Select the  $\geq$  operator from the list.
5. Enter the age parameter.
6. Within the **Selected Columns** section, add **Person > Person Identifiers, Person ID**.

### Selecting Qualifications – Smoking History Query

1. Select the **Smoking History Query**. From the qualification filter options, select **Clinical > Clinical Event**.
2. Select **Modify Filter List**.
3. Search for, select, and move appropriate selection for **Tobacco Use**.
4. Select **Include**.
5. From the qualification filter options, select **Clinical > Clinical Event Result**.
6. Select the appropriate qualification type, for example, **Constant**.
7. In **Clinical Event Result**, enter or select values.
8. From the qualification filter options, select **Clinical > Clinical Event**.
9. Search for and move the appropriate **Smoking Status** option.
10. Select **Include**.
11. From the qualification filter options, select **Clinical > Clinical Event Result**.
12. Select qualification type.
13. In **Clinical Event Result**, enter or select value for desired statuses.
14. Within the **Selected Columns** section, add **Person > Person Identifiers, Person ID**.



## Appendix C: Discern Analytics (cont'd)

### Selecting Qualifications – LDL Query

1. Select the LDL Query. From the qualification filter options, select **Clinical > Clinical Event**. Choose = then choose the appropriate **LDL test**.
2. Select **AND**.
3. From the qualification filter options, select **Clinical > Clinical Event Result**.
4. Select operator  $\geq$ .  
Enter **70**.  
Select **AND**.
5. From the qualification filter options, select **Clinical > Date Performed > CE-Performed DT/TM**.
6. Select **Modify Filter List**, and select desired time frame, for example, **Last 12 months**. Select **Include**.
7. From the qualification filter options, select **Clinical > Clinical Event Result Unit**.
8. Select **Modify Filter List**, and select desired time frame, for example, **mg/dL**.
9. Select **Include**.
10. Within the **Selected Columns** section, add **Person > Person Identifiers, Person ID**.

### Selecting Qualifications – Statins Query

1. Select the **Statins Query**. From the qualification filter options, select **Orders, Orderable, Order Long Description**.
2. Select **Modify Filter List**.
3. Filter or search for, move and include appropriate Statins.
4. From the qualification filter options, add **Orders > Order Action > All > Action Order Status**.
5. Select **Modify Filter List**.
6. Search for, select and include appropriate **Action Order Statuses**.
7. Within the **Selected Columns** section, add **Person > Person Identifiers, Person ID**.

### Selecting Qualifications – Diabetes Query and Hypertension Query

*Note: Steps used in this example can be used for both the Diabetes Query and the Hypertension Query.*

1. Select the appropriate **Query**. From the qualification filter options, select **Problems > Problem Code**.
2. Select **Modify Filter List**.
3. Search for and move appropriate codes for the condition. Select **Include** when done.
4. Within the **Selected Columns** section, add **Person > Person Identifiers, Person ID**.





## Appendix C: Discern Analytics (cont'd)

### Connecting the Queries

1. Select the **Major ASCVD query** tab.
2. Add the **Person > Person Identifiers > Person ID** to the **Qualifications** section.
3. From the **Qualification Type** dropdown, select **Subquery**.
4. From the **Formula** dropdown, select **In**.
5. Choose **Select Query ellipsis**; select the **Age Query** and click **OK**.
6. Repeat steps 2-5 adding a Qualification to include a Patient ID Subquery for each additional risk-factor query.

### Defining Columns and Settings

1. From the **Major ASCVD query** tab, select desired display columns from the options list using the Selected Columns move button. Column Criterion can include, but is not limited to the following:
  - Person > Demographics > Name – Full
  - Person > Demographics > Medical Record Number
  - Person > Demographics > Phone
  - Person > Demographics > Email
  - Person > Demographics > Age – Years
  - Problems > Problem Code
  - Orders > Orderable > Order Catalog Long Desc
  - Orders > Order Action > All > Action Order Status
  - Clinical Events > Clinical Event
  - Clinical Events > Clinical Event Result
2. Select the **General** tab.
3. Set **Query Timeout** to desired range.

### Report Output

1. To run the report, right-click on the report name from the **Domains** tab, then select **Run query in viewer**.
2. To save the report, select **File, Save As**, and name the report appropriately.
3. To add the report to a specific folder, right-click on the report and select **Add to Folder**. Select an appropriate folder, then select **OK**.

*Note: Folders can be added or modified from the report tab as applicable.*

4. To export report data for further review and data manipulation, select **Export Data** from the report viewer.
5. Queries can be set to be personal or public. If the query is set to public other users who have access to the domain folder that query is stored in will have access to the query. To set a query as public:
  - Navigate to the **General** tab
  - Change the **Visibility** to **Public** and save the query



## Appendix D: Discern Alerts

### Criteria Used in This Guide as an Example

*Criteria were purposefully selected to include a broad scope of build steps for reference.*

*Example criteria include one major ASCVD event plus 2 additional risk factors within specific timeframes and an LDL-C level that meet recommendations for treatment evaluation.*

**Major ASCVD Event:** Any 1 item from one of these 4 diagnosis groups defines a Major ASCVD Event<sup>5</sup>

- Recent Acute Coronary Syndrome (ACS)
- History of MI
- History of Ischemic Stroke
- Symptomatic PAD

**VHR ASCVD Risk Factors:** an ASCVD patient who also has any 2 or more of these criteria is considered very high risk<sup>5</sup>

- Age  $\geq$  65 years
- Current Smoker
- LDL-C  $\geq$  100 mg/dL persistently, despite maximally tolerated statin therapy and ezetimibe
- Diabetes mellitus
- Hypertension

**2022 ACC Expert Consensus Decision Pathway Recommendations:** evaluate treatment to consider addition of nonstatin therapies<sup>5</sup>

- LDL-C  $\geq$  55mg/dL or LDL-C  $<$  50% reduction
- Currently prescribed maximally-tolerated statin therapy

### Build Process Topics

- Create a New Rule
- Build the Evoke Section
- Build the Logic Section
  - Create the Major Event Logic
  - + Risk Factors Logic Overview
  - Create the 2+ Risk Factors Logic
- Build the Actions Section
- Activate the Rule



## Appendix D: Discern Alerts (cont'd)

### Create a New Rule

1. In Cerner Program Files, launch **DiscernDev.exe**.
2. Select **File, New... Expert Knowledge Module**.
3. From the **Maintenance** tab, enter new rule details according to the organization's naming conventions and parameters:
  - Title: *POST MI AT RISK PATIENTS*
  - File Name: at health system discretion
  - Duration: as appropriate
  - Validation: Testing
4. At the bottom of the window, select the **Knowledge** tab to begin building the new rule.

### Build the Evoke Section

1. In the Evoke Section of the rule, select **Select Evoke Event**.
2. Search for and select **OPENCHART** from the list and select **OK**.  
*Note: CLOSECHART, CLINICAL\_EVENT, or other desired Evoke action may be used at the organization's discretion. However, for this example, OPENCHART must be included.*
3. From the **Templates** tab, Evoke subtab, select the template **EKS\_APPLICATION\_E** to add section **E1**. Links display to enable the selection of the criterion details.
4. Select the **QUALIFIER** link to display a list of options. Choose **is listed in**.
5. Select the **Application** link.
6. From the **Expert Referential List Help**, search for and select appropriate application(s), for example **HNA: Powerchart**.
7. Select the down arrow to move the selection(s) to the list.
8. Select **Finish** to commit the selection.
9. From the Evoke Templates, select **EKS\_USER\_POSITION\_E** to create section **E2**.
10. Set the **QUALIFIER** link to **is listed in**.
11. Select the **POSITION** link.
12. Highlight all applicable provider user roles. Move them to the selection list.
13. Select **Finish** to commit the selection.

### Build the Logic Section Overview

#### Steps to Build the Logic Using Nested Criteria:

- Set Logic to be true
- Nested logic to define the Major ASCVD events



## Appendix D: Discern Alerts (cont'd)

- Nested Logic for Risk Factors
- Evaluate count for display/do not display

*Note: This guide uses nested logic loops to distinguish and count the **2 or more risk factors**. Alternate methods may exist but are not addressed here.*

### Create the ASCVD Major Event Logic

#### Create a Nested Group for MI Diagnosis Within the Current Encounter

1. From the **Templates** pane, **Logic** tab, choose **EKS\_LOGIC\_TRUE** as **L1**.
2. Open the “**Palette**” section.
3. From the **Palette**, choose “**Grouping**” and place it underneath **L1, AND**.
4. Choose “**Grouping**” again to place a second set of parentheses nested within the first section.
5. Click the mouse inside the innermost parentheses set.
6. From the **Templates** tab, **Logic** subtab, select the template **EKS\_DIAGNOSIS\_FIND\_L** to add section **L2**.
7. Click on **OPT\_DIAGNOSIS**.
8. Before searching, define Terminology by selecting the ellipsis button on the right.
9. Select the appropriate types of terminology in use for the organization and then click **OK**.
10. From the **OPT\_DIAGNOSIS** window, search for and select all terminology appropriate to use for Myocardial Infarction, then click **OK** to return to the L2 section.
11. In the second line of options, click the option labeled **for encounter L?**. Choose **L1**.
12. From **Templates**, choose **EKS\_DIAGNOSIS\_DTTM\_DETAIL\_L** as L3. Use **AND** logic between L2 and L3.
13. Add detail fields to set a lookback timeframe as appropriate.

#### Create a Nested Group for an MI Within any Encounter From the Last 90 Days

1. From the palette, add parentheses, nesting them within the existing parent parentheses.
2. Change **AND** to **OR** so that either L2-L3 section or L4-L5 can be true.
3. In the **Templates** section, choose **EKS\_PROBLEMS\_FIND\_L** as **L4**.
  - In the **OPT\_PROBLEM** field, add the appropriate terminology for Myocardial infarction. (*refer to OPT\_DIAGNOSIS above for steps*)
  - For the **for person L?** field, choose **L1**
4. In the **Templates** section, choose **EKS\_PROBLEMS\_DATETIME\_DETAIL\_L** as **L5**.



## Appendix D: Discern Alerts (cont'd)

### Create a Nested Group for Additional Major Event Problems

1. From the palette, add parentheses, nesting them within the existing parent parentheses.
2. Change **AND** to **OR** to allow L2-L3 section or L4-L5 section or L6-L7 section to be true.
3. From **Templates**, choose **EKS\_PROBLEM\_FIND\_L** as **L6**.
  - In the **OPT\_PROBLEM** field, add the appropriate terminology for **Recent ACS, History of Ischemic Stroke, and Symptomatic PAD**
  - For the **for person L?** field, choose **L6**
4. From **Templates**, choose **EKS\_PROBLEMS\_DETAIL\_L** as **L7**.

### 2+ Risk Factors Logic Overview

These sections use nested parentheses with “OR” functionality. **Each section follows this workflow:**

- Nest three levels of (groups) parentheses
- Next, within the 3rd level (innermost) parentheses, test one risk factor to determine if it applies or not
- Set an Append message indicating a true statement
- Add a logic true statement in the 2nd Level for that risk factor
- Verify correct logic
- **Repeat this process for each risk factor to be included**

#### 2+ Risk Factors Logic – AGE

1. Within the 3rd (innermost) logic level, choose the template **EKS\_AGE\_EVAL\_L** as **L8** and fill in values for **Evaluation, Age1 and Unit1, for Person L?**
2. While still within the 3rd logic level, choose the template **EKS\_BUILD\_MESSAGE\_L** as **L9**, and fill in values for **Action, MSGNAME** and **MSGTEXT**.
3. From within the second-level innermost parentheses, choose template **EKS\_LOGIC\_TRUE** as **L10**.
4. Change the **AND** to **OR** to connect L8 & L9 with L10, allowing either L8-L9 or L10 to be true.

#### 2+ Risk Factors Logic – Smoking

1. Within the 3rd (innermost) logic level, choose the Template **EKS\_CE\_RESULTA\_MOST\_RECENT\_L** as **L11**, and fill in values for **SMOKING STATUS, and for same encounter L?**
2. While still within the 3rd logic level, choose the Template **EKS\_BUILD\_MESSAGE\_L** as **L12**, and fill in values for **ACTION, MSGNAME, and MSGTEXT**.
3. From within the second-level innermost parentheses, choose template **EKS\_LOGIC\_TRUE** as **L13**.
4. Change the **AND** to **OR** to connect L11 & L12 with L13, allowing either L11-L12 or L13 to be true.



## Appendix D: Discern Alerts (cont'd)

### 2+ Risk Factors Logic – LDL Results

1. Within the 3rd (innermost) logic level, choose the Template **EKS\_CE\_RESULTA\_MOST\_RECENT\_L** as **L14**, and value **Req LDL Cholesterol Level**, and **for same encounter as L?**.
2. While still within the 3rd logic level, choose the Template **EKS\_BUILD\_MESSAGE\_L** as **L15**, and fill in **values for ACTION, MSGNAME, and MSGTEXT**.
3. From within the second-level innermost parentheses, choose template **EKS\_LOGIC\_TRUE** as **L16**.
4. Change the **AND** to **OR** to connect L14 & L15 with L16, allowing either L14-L15 or L16 to be true.

### 2+ Risk Factors Logic – Statin Use

1. In the 3rd (innermost) logic level, choose the template **EKS\_ORDERS\_FIND\_L** as **L17**, and fill in values for **ORD\_METHOD, OPT\_ORDERS, OPT\_QUAL, OPT\_TIME\_NUM, OPT\_TIME\_UNIT, and OPT\_ANCHOR\_DT\_TM**.
2. While still within the 3rd logic level, choose the template **EKS\_BUILD\_MESSAGE\_L** as **L18**, and fill in **values for ACTION, MSGNAME, and MSGTEXT**.
3. From within the second-level innermost parentheses, choose template **EKS\_LOGIC\_TRUE** as **L19**.
4. Change the **AND** to **OR** to connect L17 & L18 with L19, allowing either L17-L18 or L19 to be true.

### 2+ Risk Factors Logic – Diabetes Mellitus

1. Within the 3rd (innermost) logic level, choose the template **EKS\_PROBLEMS\_FIND\_L** as **L20**, and fill in values for **ORD\_METHOD, OPT\_ORDERS, and for person L?**.
2. While still within the 3rd logic level, choose the template **EKS\_BUILD\_MESSAGE\_L** as **L21**, and fill in **values for ACTION, MSGNAME, and MSGTEXT**.
3. From within the second-level innermost parentheses, choose template **EKS\_LOGIC\_TRUE** as **L22**.
4. Change the **AND** to **OR** to connect L20 & L21 with L22, allowing either L20-L21 or L22 to be true.

### 2+ Risk Factors Logic – Hypertension

1. Within the 3rd (innermost) logic level, choose the template **EKS\_PROBLEMS\_FIND\_L** as **L23**, and fill in **ORD\_METHOD, OPT\_ORDERS, and for person L?**.
2. While still within the 3rd logic level, choose the template **EKS\_BUILD\_MESSAGE\_L** as **L24**, and fill in values for **ACTION, MSGNAME, and MSGTEXT**.
3. From within the second-level innermost parentheses, choose template **EKS\_LOGIC\_TRUE** as **L25**.
4. Change the **AND** to **OR** to connect L23 & L24 with L25, allowing either L23-L24 or L25 to be true.



## Appendix D: Discern Alerts (cont'd)

### 2+ Risk Factors Logic – Calculation

1. Between each major section should be the **AND** function to connect the risk factors sections.
2. Outside the parentheses, select the template **EKS\_CALC\_SAVE\_L** in **L26**, and within **Expert Editor EXPRESSION** enter (**@LOGIC:9 + @LOGIC:12 + @LOGIC:15 + @LOGIC:18 + @LOGIC:21 + @LOGIC:24**).

*Note: This statement evaluates the EKS\_BUILD\_MESSAGE\_L templates for true (1) or not true (0), by adding them together.*

3. Select **OK**.
4. Select template **EKS\_EVAL\_L** as **L27**. This template is needed to ensure at least 2 items (Age, LDL Cholesterol, etc) are true. For **EXPRESSION** enter **@MISC26 > 1**.

### Build the Actions Section

1. Select the **Action Section** of the rule.
2. From the **Templates** pane, choose **EKS\_ALERT\_FLEX\_A**, to add section A1.
  - Select **OPT\_TITLE** and enter the applicable title (eg, **VHR ASCVD Screening Eligibility**)
  - Select **TXT** and enter applicable message text that utilizes both the message built with **EKS\_MESSAGE\_BUILD\_L** and the number of items that qualify (eg, “**Treatment evaluation is recommended for this at-risk patient with VHR ASCVD. Patient has @MISC:26 risk factors, which are as follows: @MESSAGE:[MYMSG]**”)
3. Choose options as desired for additional actions or information to be displayed to the provider.
  - Select **OPT\_ORDERS**, highlight applicable orders or order sets, and select **Finish**
  - Select **OPT\_URL\_BUTTON\_NAME**, enter applicable button name (eg, Amgen CV website)
  - Select **OPT\_URL\_ADDRESS**, enter the applicable URL hyperlink (if appropriate)

### Activate the Rule

The save and enable steps ensure that the rule is placed into an active state for use in the production environment. *Discern servers must be cycled once a rule has been created or modified.*

1. Select the **Maintenance** tab.
2. Select the **Validation** dropdown and choose **PRODUCTION**.
3. Navigate to **File > Save**.



## Appendix E: Health Maintenance Recommendations

### Health Maintenance

- Is accessible in the Health Maintenance section of the patient chart
- Forecasts due dates for VHR ASCVD risk evaluation based on necessary current diagnoses, and optional patient age, past and current health conditions, and treatments
- Due dates will automatically update when satisfied through appropriate orders or by manual update

### Build Process Topics

- Build Schedules
- Building Health Maintenance Rule Foundation
- Building Rules for Additional Risk Factors
- Building the Comprehensive Rule

### Pre-Build: Start Health Maintenance Servers

1. Start servers 455, 456 (if using MRP), 360 (Health Expert), and 366 (Health Recommendations).
2. Once the new server is ready to be used by the application, set the **Enable Recommendations** property on server 366 to a value of **YES** or **Y**.
3. Verify that only one instance of the Health Maintenance Agents (SCP 534) server is running in your environment.

*Note: When any changes are made to Health Maintenance cycle, the Health Maintenance Agents server (SCP534) and Health Expert server (SCP 360) on all nodes.*

### Build Schedules

Schedules are comprised of Series, Expectations, Steps, and Satisfiers.

1. **Schedule:** To add a new schedule in the **Build Tool**, click **New** or right-click and select **New Schedule**.
2. Name the Schedule, for example, **VHR ASCVD At Risk**.
3. Select a level for the new schedule, for example, **Base**. Select or confirm the **Type of Health Maintenance**.
4. **Series:** From the schedule tree, add a new series by right-clicking the schedule to which the new series is being added and select **Add Series** (eg, VHR ASCVD).
5. **Expectations:** From the schedule tree, right-click the applicable series to add a new expectation and select **Add Expectation** (eg, Treatment with *[Medication]*).
6. **Steps:** To add a new step, right-click on the applicable expectation and select **Add Step**. Enter appropriate steps for the progression of a treatment (eg, Order for *[Medication]* by medication class, Order to continue the order for medication class, revise treatment etc). Select the appropriate audience.





## Appendix E: Health Maintenance Recommendations (cont.)

7. **Satisfiers:** To add a new satisfier, right-click on the applicable step and select **Add Satisfier**.
8. Create the **Satisfier Names** and add appropriate detail, for example, duration and type:

*Note: The satisfier type or item (order\_id, event code) associated with a satisfier should never be changed. If a mistake has been made, inactivate the old satisfier, and build a new one.*

### Building Health Maintenance Rules – Overview

These steps explain the process used in this example.

1. Create a New Rule to define an **ASCVD** patient; a patient with any 1 of the major ASCVD events.
  - Add Required Inclusion Statements to define the patient who has ASCVD
  - Assign a condition to the patient, eg, BASE\_ASCVD
2. Create rules to define a patient with ASCVD plus other risk factors.
  - Add Required Inclusion Statements to define the patient who has ASCVD
  - Assign each a condition that reflects the base condition plus another risk factor
3. Create a comprehensive rule which uses these conditions to define patients with additional risk factors to be VHR ASCVD.
  - Assign the VHR ASCVD condition
  - Assign the appropriate expectations to those patients

### Create a New Rule

**Purpose:** To create a new rule to define the ASCVD population.

1. From HERuleBuilder.exe, select the **Rule Group** dropdown and select **Conditions**.
2. From the menu bar select **Edit > New Rule**. Enter desired rule name (eg, ASCVD BASE).
3. Select the newly created rule from **Rule Name** task pane (eg, ASCVD BASE).
4. Set rule parameter **Condition Operator** to **If at least one of the following are true**.
5. Select **OK**.

### Add Required Inclusion Statements

**Purpose:** Defining criteria to include patients who have ASCVD.

1. Select **Add Sentence**.
2. In the **Sentence Selection** window ensure **Sentence Type - If** is highlighted.
3. In **Sentence Criteria**, check **Problem**.



## Appendix E: Health Maintenance Recommendations (cont.)

4. Choose appropriate sentence(s) for the preferred criteria (SNOMED, ICD-10) for example:  
*The person **has an active or resolved problem** with a vocabulary of <vocabulary> that equals <code>.*
5. Select **Add**.
6. Select **<vocabulary>** from the sentence in the rule window.
7. Enter *ICD-10*, for example.
8. Select **<code>** from the sentence in the rule window.
9. In the **Edit Parameter** field, select *ICD-10 codes*, then select **OK**.

\*See Appendix for list of appropriate codes.

10. Repeat steps 1-9 to include additional sentences for appropriate Major Event conditions to test:
  - Recent ACS
  - History of MI
  - History of Ischemic Stroke
  - Symptomatic PAD

### Assign the Condition

**Purpose:** Assign a new condition to the patient who meet the criteria, which can be used in a 2nd rule to identify patients with additional risks.

1. Create a **Then** sentence:
  - Select **Add Sentence**
  - In the **Sentence Selection** window, ensure **Sentence Type - THEN** is highlighted
  - In **Sentence Criteria**, check **Condition**
  - Choose the appropriate sentence, for example:  
*The person **has a condition of** <condition>*
  - Select **<condition>** In the **Edit Parameter** window, enter a unique name for the “condition,” for example, **BASE\_ASCVD**
  - Select **OK**

### Building Rules for Additional Risk Factors

**Purpose:** Once the base rule is created, it can be combined with other criteria to build “combination” risk factors, eg, the patient has ASCVD and qualifies for the age risk factor. This guide shows one example, along with suggestions for additional groupings.



## Appendix E: Health Maintenance Recommendations (cont.)

1. Create a New Rule.
  - From HERuleBuilder.exe, select the **Rule Group** dropdown and select **Conditions**
  - From the menu bar select **Edit > New Rule**
  - Enter desired rule name (eg, ASCVD + AGE)
  - Select the newly created rule from the **Rule Name** task pane
  - Set rule parameter **Condition Operator** to If all the following are true
  - Select **OK**
2. Add Criterion for ASCVD patient.
  - Select **Add Sentence**
  - In the **Sentence Selection** window ensure **Sentence Type - If** is highlighted
  - Select **Sentence Criteria**, check **Condition**
  - Choose appropriate sentence, for example:  
*The person **has a condition of** <condition>*
  - Select <condition> from the sentence in the rule window
  - In the **Edit Parameter** window, enter the unique name for the “condition” previously defined in the THEN sentence, for example **BASE\_ASCVD**
  - Click **OK**
3. Add Criterion for Age.
  - Select **Add Sentence**
  - In the **Sentence Selection** window ensure **Sentence Type - If** is highlighted
  - Select **Sentence Criteria**, check **Age**
  - Choose appropriate sentence, for example:  
*The person is **at least** <> **years old***
  - Select <> from the sentence in the rule window, and set parameter to **65**
4. **Assign the Condition:** (Assign a new condition to the patient who meets the criteria, which can be used in a 2nd rule to identify additional at-risk patients).
  - Select **Add Sentence**
  - In the **Sentence Selection** window ensure **Sentence Type - THEN** is highlighted
  - In **Sentence Criteria**, check **Condition**
  - Choose appropriate sentence, for example:  
*The person **has a condition of** <condition>*
  - Select <condition> from the sentence in the rule window. In the Edit Parameter window, enter a unique name for the “condition”, for example **BASE\_ASCVD\_AGE**
  - Click **OK**



## Appendix E: Health Maintenance Recommendations (cont.)

5. As desired, repeat Step 4, #1-4 to create additional risk-factor rules and conditions. The table below suggests some risk factor groupings. Other groupings should be considered based on the health system population and preferences.

Rule Name	Additional Risk Factors	THEN - Example condition name
ASCVD + Age	≥ 65	BASE_ASCVD_AGE
ASCVD + Diabetes	Diabetes Mellitus	BASE_ASCVD_DIABETES
ASCVD + Hypertension	Hypertension	BASE_ASCVD_HYPERTENSION
ASCVD + LDL	LDL-C ≥ 100 mg/dL persistently, despite maximally tolerated statin therapy and ezetimibe	BASE_ASCVD_LDL
ASCVD + Smoking	Tobacco – current or historical use of smoking tobacco	BASE_ASCVD_SMOKING

### Building the Comprehensive Rule

**Purpose:** To build a rule which tests existing rules for conditions resulting in recommendations.

- Create a new rule.
  - From HERuleBuilder.exe, select the **Rule Group** dropdown and select **Recommendation Actions**
  - From the menu bar select **Edit > New Rule**
  - Enter desired rule name (eg, VHR ASCVD)
  - Select newly created rule from **Rule Name** task pane
  - Set rule parameter **Condition Operator** to **If at least one of the following is true**
- Add Sentence for conditions.
  - Select **Add Sentence**
  - In the **Sentence Selection** window ensure **Sentence Type - If** is highlighted
  - Select **Sentence Criteria**, check **Condition**
  - Choose appropriate sentence, for example:  
*The person **has a condition of** <condition>*
  - Select <condition> from the sentence in the rule window
  - In the **Edit Parameter** window, enter the unique name for the “condition” defined in the THEN sentence (Step 3, #5 above), for example **BASE\_ASCVD**
  - Click **OK**



## Appendix E: Health Maintenance Recommendations (cont.)

3. Repeat #2 adding the same sentence for each newly created condition.
  - BASE\_ASCVD\_AGE
  - BASE\_ASCVD\_DIABETES
  - BASE\_ASCVD\_SMOKING
  - BASE\_ASCVD\_HYPERTENSION
  - BASE\_ASCVD\_STATINS
  - BASE\_ASCVD\_LDL
4. Add **THEN** sentences.
  - The person **has a condition of <condition>**
  - Select **<condition>** from the sentence in the rule window
  - In the **Edit Parameter** window, enter the unique name for the “condition” for example **ASCVD\_AT-RISK**
  - The person qualifies for expectation <expectation>
  - Select the appropriate **Expectations** (previously created)
5. Save the rule, following health system protocols for validation and publishing.

*Note: When any changes are made to Health Maintenance cycle the Health Maintenance Agents server (SCP534) and Health Expert server (SCP 360) on all nodes.*



## Appendix F: Patient Communications

### Using Health Maintenance to Automate HealtheLife Patient Outreach

Healthcare providers can request automated patient portal outreach for VHR ASCVD screening within Oracle Cerner. The patient portal outreach will be sent if the criteria are met. Additionally, providers can manually assign patients to an invitation list from within Dynamic Worklist.

There are multiple ways to automate patient outreach. The process outlined in this guide provides straightforward steps using Health Maintenance and Invitation components. Your health system or EHR support team may use an alternate method.

### Build Process

The Build Guide is based on Health Maintenance. Invitation components are configured within Bedrock®.

- Building Invitation Groups
- Building Workflows
- Building Invitation Programs

*Assumptions:*

- *An appropriate message template exists*
- *Invitation preferences have been defined in `prefmaint.exe` for all appropriate user Positions*
- *A Health Maintenance expectation has been configured*

### Building Invitation Groups

1. From the Cerner Program Files folder, launch `Bedrock.exe`.
2. From the **Design, Build, and Maintenance** tab, select **PowerChart** and select the **Health Maintenance Invitations** wizard.
3. Select the **Define invitation groups** radio button and select **Begin**.
4. Select **Add a new invitation group** (or select **Modify an existing invitation group** if applicable) and select **Next**.
5. From the **Define Invitation Group Details** window, enter desired naming convention in the field labeled **Invitation group name**.
6. Select **Filter** to narrow the search for the desired location.
7. From the **Filter Facilities** window, enter the filters and select **Apply Filter**.
8. Expand the desired location hierarchy, highlight the desired location, and select the **Move** arrow.  
*Note: Only one location can be selected at a time, regardless of the location hierarchy selection.*
9. In the field labeled **Generate invitations for patients seen at this location in the last** enter desired look-back period.
10. From the **Save communication generated for patients at this location group with the following document type**, select the appropriate storage location for communications, if applicable.
11. Select **Next**.



## Appendix F: Patient Communications (cont.)

12. Select **Browse** and open desired reminder message template.

*Note: Patient education materials and/or links to web content should be embedded within the message template as applicable.*

*Note: The reminder message template must be in .RTF format to be uploaded. Logos and images are not supported—templates should be updated accordingly prior to being uploaded.*

13. Select **Next** and repeat until all desired templates are uploaded.

14. Select **Finish**. Create additional groups if needed.

### Building Workflows

1. From the **Health Maintenance Invitations** wizard, select the **Maintain workflows** radio button and select **Begin**.
2. Select **Add a new workflow** and select **Next**.
3. Enter desired naming convention in the field labeled **Workflow name**.
4. From the **Available Statuses** pane, highlight applicable statuses (ie, Qualified, Cancel Reminder, Letter Sent, etc.) and select the **Move** arrow, and select **Next**.

*Note: If no statuses are listed, they will need to be added using the “Add” function. Status naming conventions are viewable by end-users, but workflow naming conventions are not.*

5. Define the workflow parameters as desired and select **Finish** when completed.

*Note: The generate letter option must be checked for at least one status in order to print/send a reminder.*

### Building Invitation Programs

1. From the **Health Maintenance Invitations** wizard, select the **Define invitations programs** radio button and select **Begin**.
2. Select **Add a new program** and select **Next**.
3. Enter desired naming convention in the field labeled **Invitation program name**.

*Note: The invitation program name displays on the patient reminder message and also to end-users.*

4. From the **Invitations Groups** pane, highlight the previously defined location, and select **Next**.
5. From the **Health Maintenance Expectations** pane, highlight the desired expectation to be associated with the program, and select **Next**.

*Note: Only one expectation can be selected at a time, and programs must be built separately. Time frames are dependent upon the threshold set within the Health Maintenance steps and expectations and may vary based on build considerations.*

6. From the **Workflows** pane, highlight the desired workflow to be associated with the program.



## Appendix F: Patient Communications (cont.)

7. From the **Select letter type** section, select the **Use program specific text** radio button, and select **Next**.
8. From the **Program or Status** pane, highlight the applicable program, select **Browse**.
9. From the dialog box, select the applicable template; choose **Open**.
10. If appropriate, select **Next** to copy the template design to other groups.
11. Select **Finish** to complete the program. Repeat the process until desired programs are created for all groups.
12. To generate communication for a particular program, select **Generate Communications**.
13. If specific patients are selected using the check box before selecting **Generate Communications**, only those patients will have communications generated. Selecting **Generate Communications** without selecting specific patients will print all eligible patients for the advanced filter and tab currently selected (including hidden patients displayed by selecting the **More** button).

*Note: To ensure that all patients scheduled for a letter are included in the current print-out, the advanced filter setting Patients with Scheduled Letter can be used.*





## Appendix G: Primary Care Provider Communications

### Creating an Automated Message Center Message

Primary Care Provider (PCP) Communications are used to engage and advise the identified patient's Primary Care Provider. An Expert Knowledge Module (EKM) rule can be created that will automate a message to a particular provider's inboxes based on a new diagnosis of Myocardial Infarction. EKM rules use known patient-related activities as the catalyst for actions, such as creating orders, adding clinical events, or sending messages.

### Build Process

Configure an EKM Rule within DiscernDev.exe with these components:

- Evoke statement using the addition of a new diagnosis of Myocardial Infarction, ICD-10 code I12.9, to a patient chart
- Logic statements to narrow the targeted patient population
- Action Groups based on Logic Statements to automate a message to the patient's PCP and Cardiologist

### Evoke Templates Used in This Guide

- EKS\_DIAGNOSIS\_E
- EKS\_STOP\_LOGIC
- EKS\_DIAGNOSIS\_INCOMING\_L
- EKS\_DIAGNOSIS\_DTTM\_DETAIL\_L
- EKS\_CE\_RESULT\_MOST\_RECENT\_L
- EKS\_INBOX\_A

### Create the Rule and Evoke Criterion

1. From the Cerner Program Files folder, launch DiscernDev.exe.
2. Select **File, New..., Expert Knowledge Module** to create a new EKM Rule.
3. From the **Maintenance** tab, enter new rule details according to the organization's naming conventions and parameters. Set the status to **PRODUCTION**.
4. Select the **Knowledge** tab to begin building the new rule.
5. In the **Evoke** section of the rule, click **Select Evoke Event**.
6. Search for and select **DIAGNOSIS\_EVENT** from the list and select **OK**.
7. Select the **OPT\_DIAGNOSIS** parameter; search for and select appropriate codes, such as Acute Myocardial infarction.

*Note: Other Evokes can be combined if it is desired to have a more complex refinement to qualify a particular patient population.*

8. Define additional parameters as appropriate.



## Appendix G: Primary Care Provider Communications (cont.)

### Create Logic Statements

1. From the Templates pane, **Logic** tab, choose **EKS\_STOP\_LOGIC**, and set the parameter to **STOP**.
2. Select the template **EKS\_DIAGNOSIS\_INCOMING\_L**. In the **OPT\_DIAGNOSIS** parameter, search for and select Acute Myocardial Infarction, for example. Define other parameters with appropriate values, specific to the health system's need and conventions.
3. Select the template **EKS\_DIAGNOSIS\_DTTM\_DETAIL\_L**. Set appropriate date and time parameters.
4. Add templates to further define the criteria, such recent lab values, for example, **EKS\_CE\_RESULT\_MOST\_RECENT\_L**.

### Create Action Groups and Statements

Due to the rule's complexity, groups of logic qualifiers are used to trigger specific Actions. Substitution values are used to pass encounter and patient information from the statements into the message. Adjust Logic Group criteria according to health system preferences and requirements.

1. Use parentheses to create an Action Group 1.
2. Build a logic statement (**IF**) statement to include all criteria, for example, **L2 AND L3 AND L4**.
3. Select an Action template appropriate for communication, for example, **EKS\_INBOX\_A**.
4. Select appropriate parameters to indicate the message type and appropriate user In-Box.
5. Build the message using
  - Substitutions (@ values) to include patient-specific data and
  - Text for the desired message content
6. Repeat steps 1-5 to add an Action Group that sends a message to a second provider.

*Note: Discern servers must be cycled once a rule has been created or modified.*



Note: Please refer to the related EHR Worksheet Resource for potential codes, inclusion and exclusion criteria for your consideration.

**References:** **1.** Klimchak AC, Patel MY, Iorga SR, et al. Lipid treatment and goal attainment characteristics among persons with atherosclerotic cardiovascular disease in the United States. *Am J Prev Card.* 2020;1:100010. **2.** Muntner P, Orroth KK, Mues KE, et al. Evaluating a simple approach to identify adults meeting the 2018 AHA/ACC cholesterol guideline definition of very high risk for atherosclerotic cardiovascular disease. *Cardiovasc Drugs Ther.* 2021;4:1-7. **3.** Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139:e1082-e1143. **4.** Colantonio LD, Shannon ED, Orroth KK, et al. Ischemic event rates in very-high-risk adults. *J Am Coll Cardiol.* 2019;74:2496-2507. **5.** Lloyd-Jones DM, Morris PB, Ballantyne CM, et al. 2022 ACC Expert Consensus Decision Pathway on the Role of Nonstatin Therapies for LDL-Cholesterol Lowering in the Management of Atherosclerotic Cardiovascular Disease Risk: A Report of the American College of Cardiology Solution Set Oversight Committee. *J Am Coll Cardiol.* 2022 Oct 4;80(14):1366-1418. doi: 10.1016/j.jacc.2022.07.006. **6.** Raymond C, Cho L, Rocco M, et al. New cholesterol guidelines: worth the wait? *Cleve Clin J Med.* 2014;81:11-19. **7.** Cannon CP, de Lemos JA, Rosenson RS, et al. Use of lipid-lowering therapies over 2 Years in GOULD, a registry of patients with atherosclerotic cardiovascular disease in the US. *JAMA Cardio.* 2021;6:1060-1068. **8.** Chatterjee P, Joynt KE. Do cardiology quality measures actually improve patient outcomes? *J Am Heart Assoc.* 2014;3:e000404. **9.** HEDIS 2020 Summary of Changes. [https://www.ncqa.org/wp-content/uploads/2019/07/20190701\\_HEDIS\\_2020\\_Measures\\_Summary\\_of\\_Changes.pdf](https://www.ncqa.org/wp-content/uploads/2019/07/20190701_HEDIS_2020_Measures_Summary_of_Changes.pdf). Accessed September 18, 2023. **10.** CMS.CMIT Measure ID:700. <https://cmit.cms.gov/cmit/#/MeasureView?variantId=5108&sectionNumber=1>. Accessed September 18, 2023. **11.** Plutzky J, Benson MD, Chaney K, et al. Population health management of low-density lipoprotein cholesterol via a remote, algorithmic, navigator-executed program. *Am Heart J.* 2022;243:15-27. **12.** Roumia M, Steinhilb S. Improving cardiovascular outcomes using electronic health records. *Curr Card Rep.* 2014;16:451-456.