Appendix 3-A: Measure Information Form (MIF)

Data Source	Electronic administrative data/claims For measure calculation, the following Medicare files were required: • Denominator tables • Prescription drug benefit (Part D) coverage tables • Beneficiary file • Institutional claims (Part A) • Non-institutional claims (Part B)—physician carrier/non-DME • Prescription drug benefit (Part D) claims For physician group attribution, the following were required: • Non-institutional claims (Part B) —physician carrier/non-DME • Denominator tables to determine individual enrollment • Beneficiary file or coverage table to determine hospice benefit and Medicare as secondary payor status • CMS physician and physician specialty tables • National Plan & Provider Enumeration System (NPPES) database	**Measure Set ID**	TBD
Version Number and Effective Date	Version 2 January 1, 2011 – December 31, 2011	**CMS Approval Date**	TBD
NQF ID	NQF #543	**Date Endorsed**	09/21/2011
Care Setting	Ambulatory care Office	**Unit of Measurement**	Population: States; Clinicians: Group
Measurement Duration	Any time during the measurement period.	**Measurement Period**	Year
Measure Type	Process	**Measure Scoring**	Rate/proportion
Payer Source	Medicare fee-for-service (FFS)	**Improvement Notation**	Better quality = higher score
Measure Steward	CMS		
Copyright / Disclaimer	Not applicable		
Measure Description	The percentage of individuals with Coronary Artery Disease (CAD) who are prescribed statin therapy that had a Proportion of Days Covered (PDC) for statin medications of at least 0.8 during the measurement period (12 consecutive months).		

Rationale

In its 2010 updated heart and stroke statistics, the American Heart Association (2010) provided ample evidence of the high incidence and prevalence of Coronary Heart Disease (CHD). It estimated that in 2006 approximately 17.6 million adults (20 years and older) in the United States had CHD and 425,400 died from it. The prevalence of CHD increases rapidly with age even among the elderly, with prevalence rates reaching 36.7% in women and 22.7% in men 80 years and older according to data from the 2003-2006 National Health and Nutrition Examination Survey (NHANES). CHD is the leading major cause of mortality in the United States, accounting for about 16.6% of all deaths. In 2007, an estimated 565,000 Americans had their first MI and another 300,000 had a recurrent MI. Total U.S. costs associated with coronary heart disease, including direct medical costs and indirect costs, are estimated to be $177.1 billion in 2010 (Rosamond et al., 2007)

Recommendations from clinical practice guidelines support the use of lipid-lowering therapy in general for patients with CAD (Grundy et al., 2004; National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults [Adult Treatment Panel III], 2001; Gibbons et al., 2002). Three randomized trials have shown improved outcomes among patients with prior myocardial infarction on statin therapy. Based on the Scandinavian Simvastatin Survival Study (4S) (1994), the Cholesterol And Recurrent Events (CARE) trial (Sacks et al., 1996), and the Long-Term Intervention with Pravastatin in Ischemic Disease (LIPID) Study (1998), a reduction in LDL-C levels of about 25% to 35% was associated with a decrease in CAD events of about 24% to 37%. There is also specific evidence showing higher adherence to statins improves CAD outcomes. In a 5-year randomized controlled trial of men with elevated cholesterol and no prior myocardial infarction, those who were at least 75% compliant in taking pravastatin experienced a 38% decreased risk of coronary heart disease death or non-fatal myocardial infarction, a 46% decreased risk of coronary revascularization, and a 32% decreased risk for all-cause mortality compared to those with lower compliance (West of Scotland Coronary Prevention Study Group, 1997). Another study that followed patients after myocardial infarction showed a significantly reduced risk of recurrent MI (relative risk [RR] of 0.19) and all-cause mortality (RR of 0.47) for those who were at least 80% adherent to statin treatment compared to those not taking statins (Wei et al., 2002). For those who were less than 80% compliant, the effect of statin treatment was not significantly different from non-users. Another study of new users of statins found that persistent users (i.e., for at least 18 or 24 months) had a 30% lower risk of admission for acute myocardial infarction than non-persistent users (Penning-van Beest et al., 2007).

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Clinical Recommendation Statement	In its 2004 update to its 2001 recommendations, the Adult Treatment Panel III (ATP III) of the National Cholesterol Education Program recommends the following for high-risk and very high-risk persons: "In high-risk persons [i.e., "all persons with CHD or CHD risk equivalents"], the recommended LDL-C goal is less than 100 mg/dL. • An LDL-C goal of less than 70 mg/dL is a therapeutic option on the basis of available clinical trial evidence, especially for patients at very high risk. • If LDL-C is greater than or equal to 100 mg/dL, an LDL-lowering drug is indicated simultaneously with lifestyle changes. • If baseline LDL-C is less than 100 mg/dL, institution of an LDL-lowering drug to achieve an LDL-C level less than 70 mg/dL is a therapeutic option on the basis of available clinical trial evidence. • If a high-risk person has high triglycerides or low HDL-C, consideration can be given to combining a fibrate or nicotinic acid with an LDL-lowering drug. When triglycerides are greater than or equal to 200 mg/dL, non-HDL-C is a secondary target of therapy, with a goal 30 mg/dL higher than the identified LDL-C goal."
References	National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). (2001, May). *Third report of the National Cholesterol Education Program Expert Panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III)* [Executive summary] (NIH Publication No. 01-3670). Bethesda, MD: National Institutes of Health, National Heart, Lung, and Blood Institute. Retrieved July 12, 2007, from http://www.nhlbi.nih.gov/guidelines/cholesterol/atp3xsum.pdf
Release Notes/ Summary of Changes	• See Excel Attachment of Code Tables for NDC updates. • Updated National Drug Codes (NDCs) as of October 28, 2011. • Updated visit type codes with CPT 2011 changes, 99224-99226. • Updated ICD-9-CM and ICD-10-CM Diagnosis codes with 2011 changes, 414.00, 414.01, 414.02, 414.03, 414.04, 414.05, 414.06, 414.07, 414.4. • Added new statin combination drug sitagliptin-simvastatin.

Technical Specifications	
Target Population	At least 18 years of age as of the end of the measurement year.
Denominator	
Denominator Statement	Individuals at least 18 years and older as of the end of the measurement period with CAD and at least two claims for statins during the measurement period (12 consecutive months).
Denominator Details	**IDENTIFICATION OF CAD** Individuals with CAD are identified by having a diagnosis of CAD within the inpatient or outpatient claims data. Individuals must have: At least two face-to-face encounters with a diagnosis of CAD with different dates of service in an outpatient setting or nonacute inpatient setting during the measurement period;

	Or At least one face-to-face encounter with a diagnosis of CAD in an acute inpatient or emergency department setting during the measurement period. **CODES USED TO IDENTIFY CAD DIAGNOSIS:** ICD-9-CM: 410.xx, 411.81, 411.89, 412, 413.0, 413.1, 413.9, 414.00, 414.01, 414.02, 414.03, 414.04, 414.05, 414.06, 414.07, 414.4, 414.8, 414.9, V45.81, V45.82 ICD-10-CM*:* I20.1, I20.8, I20.9, I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I22.0, I22.1, I22.2, I22.8, I22.9, I24.0, I24.8, I24.9, I25.10, I25.110, I25.111, I25.118, I25.119, I25.2, I25.5, I25.6, I25.700, I25.701, I25.708, I25.709, I25.710, I25.711, I25.718, I25.719, I25.720, I25.721, I25.728, I25.729, I25.730, I25.731, I25.738, I25.739, I25.750, I25.751, I25.758, I25.759, I25.760, I25.761, I25.768, I25.769, I25.790, I25.791, I25.798, I25.799, I25.810, I25.811, I25.812, I25.89, I25.9, Z95.1, Z95.5, Z98.61 Current Procedural Terminology (CPT)*: 33140, 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33530, 33533, 33534, 33535, 33536, 92980, 92981, 92982, 92984, 92995, 92996 **CODES USED TO IDENTIFY ENCOUNTER TYPE:** **OUTPATIENT SETTING** CPT: 92002, 92004, 92012, 92014, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99384-99387, 99394-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456 UB-92 revenue: 051x, 0520-0523, 0526-0529, 057x-059x, 077x, 082x-085x, 088x, 0982, 0983 **NONACUTE INPATIENT** CPT: 99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337 UB-92 revenue: 0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x **ACUTE INPATIENT** CPT: 99221-99223, 99224-99226, 99231-99233, 99238, 99239, 99251-99255, 99291 UB-92 revenue: 010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x-022x, 072x, 080x, 0987 **EMERGENCY DEPARTMENT** CPT: 99281-99285 UB-92 revenue: 045x, 0981

	*CPT ©2011 American Medical Association. All rights reserved. CPT is a registered trademark of the American Medical Association. The following are the statin medications by class for the denominator. The route of administration includes all oral formulations of the medications listed below. **STATIN MEDICATIONS:** **HMG-COA reductase inhibitors :** Atorvastatin Fluvastatin Lovastatin Pravastatin Rosuvastatin Simvastatin pitavastatin **HMG-COA reductase inhibitors combinations:** amlodipine-atorvastatin ezetimibe-simvastatin niacin-lovastatin niacin-simvastatin sitagliptin-simvastatin
Denominator Exceptions and Exclusions	Not applicable
Denominator Exceptions and Exclusions Details	Not applicable
Numerator	
Numerator Statement	Individuals with CAD who filled at least two prescriptions for a statin and have a Proportion of Days Covered (PDC) for statin medications of at least 0.8
Numerator Details	The numerator is defined as individuals with a PDC of 0.8 or greater The PDC is calculated as follows: **PDC NUMERATOR:** The PDC numerator is the sum of the days covered by the days' supply of all statin prescriptions. The period covered by the PDC starts on the day the first prescription is filled (index date) and lasts through the end of the measurement period, or death, whichever comes first. For prescriptions with a days' supply that extends beyond the end of the measurement period, count only the days for which the drug was available to the individual during the measurement period. If there are prescriptions for the same drug (generic name) on the same date of service, keep the prescription with the largest days' supply. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended. **PDC DENOMINATOR:** The PDC denominator is the number of days from the first prescription date through the end of the measurement period, or death date, whichever comes first.

Optional Calculation Using More Than One Year of Data:

Optional PDC Numerator:

- For new users (individuals with no prescriptions for statins in the 180 days prior to the measurement period), the PDC numerator is the sum of the days covered by the days' supply of the statin prescriptions during the measurement period. The period covered by the PDC for new users starts on the day the first prescription is filled (index date) and lasts through the end of the measurement period, or death, whichever comes first. For prescriptions with a days' supply that extends beyond the end of the measurement period, count only the days for which the drug was available to the patient during the measurement period. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended.

- For continuous users (individuals with 1 or more prescriptions for statins in the 180 days prior to the measurement period), the PDC numerator is the sum of the days covered by the days' supply of the statin prescriptions during the measurement period. The period covered by the PDC for continuous users is the beginning of the measurement period through the end of the measurement period or death, whichever comes first. For prescriptions with a days' supply that extends beyond the beginning or end of the measurement period, count only the days for which the drug was available to the individual during the measurement period. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended.

Optional PDC Denominator:

- For new users, the PDC denominator is the number of days that starts on the day the first prescription is filled (index date) and lasts through the end of the measurement period, or death, whichever comes first.

- For continuous users, the PDC denominator is the number of days from the beginning of the measurement period through the end of the measurement period, or death, whichever comes first.

Optional Calculation Adjusting for Hospitalizations (one year of data):

- If the individual is hospitalized between the index date and end date, each inpatient visit is treated as a prescription and as days covered for each statin that the individual was prescribed before the hospitalization. The admit date becomes the prescription service date and the number of inpatient days becomes the days' supply.

Optional Calculation Adjusting for Hospitalizations (more than one year of data):

If the individual is hospitalized between the index date and end date for new users, or if the individual is hospitalized during the measurement period for continuous users, each inpatient visit is treated as a prescription and as days covered for each statin that the individual was prescribed before the hospitalization. The admit date becomes the prescription service date and the number of inpatient days becomes the days' supply.

Stratification or Risk Adjustment

Depending on the operational use of the measure, measure results may be stratified by:

- State
- Physician Group*
- Age/Race/Ethnicity
- Dual Eligibility

*See algorithm section below for the physician group attribution methodology used for this measure.

No risk adjustment necessary

Sampling

Not applicable

Calculation Algorithm

Denominator: Individuals at least 18 years and older as of the end of the measurement period with CAD and at least 2 claims for a statin in the measurement period.

Create Denominator:

1. Pull individuals who are 18 or older as of December 31 of the measurement period.

2. Include individuals who were continuously enrolled in Part D coverage during the measurement period, with no more than a one-month gap in enrollment during the measurement period.

3. Include individuals who had no more than a one-month gap in Part A enrollment, no more than a one-month gap in Part B enrollment, and no more than 1 month of HMO enrollment during the current measurement period (fee-for-service [FFS] individuals only).

4. Of those individuals identified in Step 3, keep those who had:
   At least 2 face-to-face encounters with a principal or secondary diagnosis of CAD with different dates of service in an outpatient setting or nonacute inpatient setting during the measurement period,

   OR

   At least 1 face-to-face encounter with a principal or secondary diagnosis of CAD in an acute inpatient setting or emergency department setting during the measurement period.

5. From the individuals identified in Step 4, extract Part D claims for a statin drug. Attach the generic name and the drug ID to the dataset.

6. Of the individuals identified in Step 5, exclude those who did not have at least 2 claims for a statin on different dates of service during the measurement period.

Numerator: Individuals with CAD who filled at least two prescriptions for a statin and has a PDC of at least 0.8 during the measurement period.

Create Numerator:
Of the individuals in the denominator, calculate the PDC for each individual according to the following methods:

1. Determine the individual's measurement period, defined as the number of days from the index prescription date through the end of the measurement period, or death, whichever comes first. Index date is the date of the first prescription in the measurement period.

2. Within the measurement period, count the days the individual was covered by at least one statin drug based on the prescription fill date and days of supply.
   a. Pull Part D statin claims for individuals in the denominator. Attach the drug ID and the generic name to the dataset.

b. Sort and de-duplicate claims by beneficiary ID, service date, generic name, and descending days' supply. If prescriptions for the same drug (generic name) are dispensed on the same date of service for an individual, keep the dispensing with the largest days' supply.
c. Calculate the number of days covered by statin drug therapy per individual.
   i. For prescriptions with a days' supply that extends beyond the end of the measurement period, count only the days for which the drug was available to the individual during the measurement period.
   ii. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended.
   iii. If prescriptions for different drugs (different generic names) overlap, do not adjust the prescription start date.

3. - Calculate the PDC for each individual. Divide the number of covered days found in Step 2 by the number of days in the individual's measurement period found in Step 1.
An example of SAS code for Steps 1-3 was adapted from PQA and is also available at the URL: *http://www2.sas.com/proceedings/forum2007/043-2007.pdf*

Using the individuals identified in the denominator, count the number of individuals with a calculated PDC of at least 0.8.

Optional PDC Calculation Using More Than One Year of Data

Optional PDC Numerator:

- For new users (individuals with no prescriptions for statins in the 180 days prior to the measurement period), the PDC numerator is the sum of the days covered by the days' supply of the statin prescriptions during the measurement period. The period covered by the PDC for new users starts on the day the first prescription is filled (index date) and lasts through the end of the measurement period, or death, whichever comes first. For prescriptions with a days' supply that extends beyond the end of the measurement period, count only the days for which the drug was available to the individual during the measurement period. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended.

- For continuous users (individuals with 1 or more prescriptions for statins in the 180 days prior to the measurement period), the PDC numerator is the sum of the days covered by the days' supply of the statin prescriptions during the measurement period. The period covered by the PDC for continuous users is the number of days from the beginning of the measurement period through the end of the measurement period, or death, whichever comes first. For prescriptions with a days' supply that extends beyond the beginning or end of the measurement period, count only the days for which the drug was available to the individual during the measurement period. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended.

Optional PDC Denominator:

- For new users, the PDC denominator is the number of days that starts on the day the first prescription is filled (index date) and lasts through the end of the measurement period, or death date, whichever comes first.

- For continuous users, the PDC denominator is the number of days from the beginning of the measurement period through the end of the measurement period, or death date, whichever comes first.

Optional Calculation Adjusting for Hospitalizations (one year of data):

- If the individual is hospitalized between the index date and the end date, each inpatient visit is

treated as a prescription and as days covered for each statin that the individual was prescribed before the hospitalization. The admit date becomes the prescription service date and the number of inpatient days becomes the days' supply.

Optional Calculation Adjusting for Hospitalizations (more than one year of data):

- If the individual is hospitalized between the index date and the end date for new users, or if the individual is hospitalized during the measurement period for continuous users, each inpatient visit is treated as a prescription and as days covered for each statin that the individual was prescribed before the hospitalization. The admit date becomes the prescription service date, and the number of inpatient days becomes the days' supply.

Physician Group Attribution:

Physician group attribution was adapted from *Generating Medicare Physician Quality Performance Measurement Results (GEM) Project: Physician and Other Provider Grouping and Patient Attribution Methodologies* (http://www.cms.gov/GEM). The following is intended as guidance and reflects only one of many methodologies for assigning individuals to a medical group. Please note that the physician group attribution methodology excludes patients that died even though the overall measure does not.

I. Identify Physician and Medical Groups

1. Identify all Tax Identification Numbers (TINs)/National Provider Identification (NPI)/UPIN combinations from all Part B claims in the measurement year and the prior year. The NPI for the performing provider is used.

   If no NPI is available on the claim, check other data sources such as CMS provider tables or the National Plan and Provider Enumeration System (NPPES) for a current NPI based on the physician UPIN. Keep records with valid NPI. Valid NPIs have 10 numeric characters (no alpha characters).

   Note: Due to NPI implementation, UPINs are not necessary for attribution using Part B data from 2008 and later.

2. For valid NPIs, pull credentials and specialty code(s). Credentials and specialty codes are pulled in the following order:
   a. From the CMS provider tables.
   b. If not found in A, then pull from NPPES.

3. Create 1 record per NPI with all credentials and all specialties. A provider may have more than 1 specialty.

4. Attach TIN to NPI, keeping only those records with credentials indicating a physician (MD or DO), physician assistant (PA), or nurse practitioner (NP).

5. Identify medical group TINs: Medical group TINs are defined as TINs that had physician, physician assistant, or nurse practitioner provider specialty codes on at least 50% of Part B carrier claim line items billed by the TIN during the measurement year or prior year. (The provider specialty codes are listed after Patient Attribution.)
   a. Pull Part B records billed by TINS identified in #4 during the measurement year and prior year.
   b. Identify claims that had the performing NPI (npi_prfrmg) in the list of eligible physicians/TINs, keeping those that match by TIN, performing NPI, and provider state code.
   c. Calculate the percent of Part B claims that match by TIN, npi_prfrmg, and provider state code for each TIN, keeping those TINs with percent greater or equal to 50%.
   d. Delete invalid TINs. Examples of invalid TINs are defined as having the same value for all 9 digits or values of 012345678, 012345678, 123456789, 987654321, or 87654321.

6. Identify TINs that are not solo practices.
    a. Pull Part B records billed by physicians identified in #4 for the measurement year and/or prior year. If the performing NPI is not on the claim, match to obtain NPI from the list created in #4 by UPIN.
    b. Count unique NPIs per TIN.
    c. Keep only those TINs having 2 or more providers.
    d. Delete invalid TINs. Examples of invalid TINs are defined as having the same value for all 9 digits or values of 012345678, 012345678, 123456789, 987654321, or 87654321.

7. Create final group of TINs from #5 and #6 (TINs that are medical groups and are not solo practices).

8. Create file of TINs and NPIs associated with those TINs. These are now referred to as the medical group TINs.

II. Identify Individual Sample and Claims

9. Create individual sample.
    a. Pull individuals with 11+ months of Parts A, B, & D during the measurement year.
    b. Verify the individual did not have any months with Medicare as secondary payor. Remove individuals with BENE_PRMRY_PYR_CD not equal to one of the following:
        - A = working-age beneficiary/spouse with EGHP
        - B = ESRD in the 18-month coordination period with an employer group health plan
        - G = working disabled for any month of the year.
    c. Verify the individual resides in the U.S., Puerto Rico, Virgin Islands or Washington D.C.
    d. Exclude individuals that enter the Medicare hospice at any point during the measurement year.
    e. Exclude individuals that died during the measurement year.

10. For individuals identified in #9, pull office visit claims that occur during the measurement year and in the 6 months prior to the measurement year.
    a. Office visit claims have CPT codes of 99201-99205, 99211-99215 and 99241-99245.
    b. Exclude claims with no physician_upin and no npi_prfrmg.

11. Attach medical group TIN to claims by NPI or UPIN if no performing NPI is available.

III. Patient Attribution.

12. Pull all Part B office claims from #11 with specialties indicating primary care, cardiology or cardiac surgery (see list of provider specialties and specialty codes). Attribute each individual to at most 1 medical group TIN for each measure.
    a. Evaluate specialty on claim (HSE_B_HCFA_PRVDR_SPCLTY_CD) first. If specialty on claim does not match any of the measure-specific specialties, then check additional specialty fields.
    b. If the provider specialty indicates nurse practitioners or physician assistants (‘50’ or ‘97’), then check additional specialty codes.

13. For each individual, count claims per medical group TIN. Keep only individuals with 2 or more E&M claims.

14. Attribute individual to the medical group TIN with the most claims. If a tie occurs between medical group TINs, attribute the TIN with most recent claim.

15. Attach the medical group TIN to the denominator and numerator files by individual.

Provider Specialties and Specialty Codes

Provider specialties and specialty codes include only physician, physician assistants, and nurse practitioners for physician grouping, TIN selection, and patient attribution. The provider specialty codes and the associated provider specialty are shown below:

01—General practice*
02—General surgery
03—Allergy/immunology
04—Otolaryngology
05—Anesthesiology
06—Cardiology*
07—Dermatology
08—Family practice*
09—Interventional pain management
10—Gastroenterology
11—Internal medicine*
12—Osteopathic manipulative therapy
13—Neurology
14—Neurosurgery
16—Obstetrics/gynecology*
18—Ophthalmology
20—Orthopedic surgery
22—Pathology
24—Plastic and reconstructive surgery
25—Physical medicine and rehabilitation
26—Psychiatry
28—Colorectal surgery
29—Pulmonary disease
30—Diagnostic radiology
33—Thoracic surgery
34—Urology
36—Nuclear medicine
37—Pediatric medicine
38—Geriatric medicine*
39—Nephrology
40—Hand surgery
44—Infectious disease
46—Endocrinology
50—Nurse practitioner*
66—Rheumatology
70—Multi-specialty clinic or group practice*
72—Pain management
76—Peripheral vascular disease
77—Vascular surgery
78—Cardiac surgery*
79—Addiction medicine
81—Critical care (intensivists)
82—Hematology
83—Hematology/oncology
84—Preventive medicine*
85—Maxillofacial surgery
86—Neuropsychiatry
90—Medical oncology
91—Surgical oncology
92—Radiation oncology

93—Emergency medicine
94—Interventional radiology
97—Physician assistant*
98—Gynecologist/oncologist
99—Unknown physician specialty
Other—NA

* Provider specialties used for patient attribution specific to this measure.