



ACUTE CORONARY SYNDROME, ANGINA & ACUTE MYOCARDIAL INFARCTION

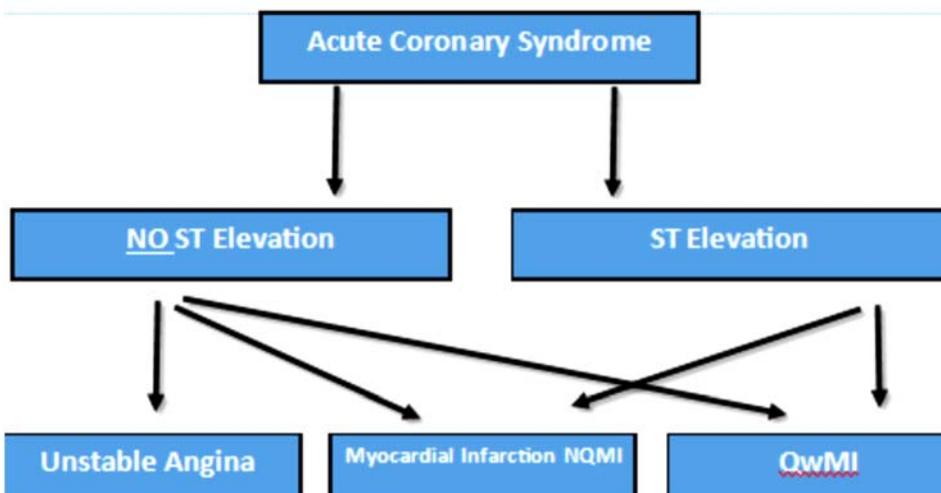
Acute Coronary Syndrome

Acute Coronary Syndrome has evolved as a useful operational term to refer to any constellation of clinical symptoms that are compatible with acute myocardial ischemia. It encompasses AMI (ST-segment elevation and depression, Q wave and non-Q wave) as well as Unstable Angina (UA). The term can present coding dilemmas.

Nomenclature of Acute Coronary Syndrome

Patients with ischemic discomfort may present with or without ST-Segment elevation on the ECG. The majority of patients with ST-segment elevation ultimately develop a Q-wave AMI (QwMI), whereas a minority develop a non Q-wave AMI (NQMI). Patients who present without ST-segment elevation are experiencing either UA or an NSTEMI. The distinction between these 2 diagnoses is ultimately made based on the presence or absence of a cardiac marker detected in the blood. Most patients with NSTEMI do not evolve a Q wave on the 12-lead ECG and are subsequently referred to as having sustained a non-Q wave MI (NQMI); only a minority of NSTEMI patients develop a Q wave and are later diagnosed as having Q wave MI. Not shown is Prinzmetal's angina, which presents with transient chest pain and ST-segment elevation but rarely MI. The spectrum of clinical conditions that range from US to non-Q wave AMI and Q wave AMI is referred to as ACS.

Acute Coronary Syndrome and Unstable Angina are not synonymous in ICD-10. ACS and CAD are not reported with the combination code that results when the patient has unstable angina.



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Grading of Angina Pectoris According to CCS Classification

CLASS	DESCRIPTION OF STAGE
I	“Ordinary physical activity does not cause...angina”, such as walking or climbing stairs. Angina occurs with strenuous, rapid, or prolonged exertion at work or recreation.
II	“Slight limitation of ordinary activity.” Angina occurs on walking or climbing stairs rapidly; walking uphill; walking or stair climbing after meals; in cold, in wind, or under emotional stress; or only during the few hours after awakening. Angina occurs on walking > 2 blocks on the level and climbing >1 flight of ordinary stairs at a normal pace and under normal conditions.
III	“Marked limitations of ordinary physical activity.” Angina occurs on walking 1 to 2 blocks on the level and climbing 1 flight of stairs under normal conditions and at a normal pace.
IV	“Inability to carry on any physical activity without discomfort—anginal symptoms may be present at rest.

Unstable Angina; Three Principal Presentations

- ① **Rest Angina:** Angina occurring at rest and prolonged, usually > 20 min
- ② **New-Onset Angina:** New-onset Angina of at least CCS Class III severity.
- ③ **Increasing Angina:** Previously diagnosed angina that has become distinctly more frequent, longer in duration, or lower in threshold (i.e., increased by \geq CCS Class to at least CCS III severity).



Ordinary physical activity does not cause angina!

Universal Definition of Myocardial Infarction

According to the expert consensus document (The Third Universal Definition of Acute Myocardial Infarction) published in *Circulation* by the American Heart Association in August, 2012, “myocardial infarction can be recognized by clinical features, including ECG findings, elevated values of biochemical markers of myocardial necrosis, and by imaging, or may be defined by pathology.” (see criteria on page 4)

When cardiac biomarkers (such as troponin or CKMB) are elevated in the absence of clinical evidence of ischemia, the provider should document the condition determined after study to have been the cause of the myocardial necrosis, such as myocarditis, pulmonary embolism, CHF, etc.



“Myocardial infarction can be recognized by clinical features including ECG findings, elevated values of biochemical markers of myocardial necrosis, and by imaging, or may be defined by pathology.”

Acute Myocardial Infarction

Six MS-DRG's are established to classify patients admitted to the acute care facility with a principal diagnosis of Acute Myocardial Infarction, (Initial Episode of Care) and who do not have an interventional procedure (other than cardiac catheterization) during that admission. These MS-DRG's are:

DRG	DESCRIPTION	PAYMENT
280	Acute MI discharged alive with Major CC	\$10,821
281	Acute MI discharged alive with CC	\$6,441
282	Acute MI discharged alive without CC/MCC	\$4,822
283	Acute MI expired with Major CC	\$10,936
284	Acute MI expired with CC	\$4,874
285	Acute MI expired without CC/MCC	\$3,353

Examples:

MS-DRG 280

A patient is admitted with a condition such as congestive heart failure which progresses to acute myocardial infarction. After study, the principal diagnosis in this example is the infarction, with an additional diagnosis of acute on chronic systolic heart failure (when acuity and type are documented).

MS-DRG 281

A patient admitted with unstable angina experiences an infarction three days after the admission. The patient also has a diagnosis of chronic diastolic heart failure. This case would assign to the MS-DRG for infarction, with a “CC” of chronic diastolic heart failure.

MS-DRG 283-285

Should the patient in either example expire, the MS-DRG assignment would be changed to MS-DRG 283-285

Criteria for Acute Myocardial Infarction

Any of the following criteria meets the diagnosis of MI:

- ⇒ Detection of rise and/or fall of cardiac biomarkers (preferably troponin) with evidence of ischemia:
 - Symptoms of ischemia
 - ECG changes indicative of new ischemia (new ST-T changes or new LBBB)
 - Pathological Q waves on ECG
 - Imaging evidence of new loss of viable myocardium, or new regional wall motion abnormality
 - Identification of intracoronary thrombus by angiography or autopsy

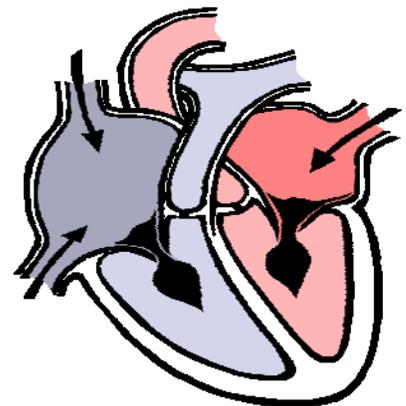
- ⇒ For patients post-PCI with normal baseline troponin, troponin elevation greater than 5 times the upper reference (URL) limit define PCI-related myocardial infarction.

- ⇒ In patients post-CABG with normal baseline troponin, a CABG-related MI may be defined as:
 - Troponin increase of 10 times URL
 - Plus either new pathological Q waves
 - Or new LBBB
 - Or angiographic evidence of new graft or coronary artery occlusion
 - Or imaging evidence of new loss of viable myocardium

MCC If Discharged Alive

These conditions impact MS-DRG assignment if the patient was discharged alive. They have no impact on MS-DRG assignment if the patient expires.

- Cardiac Arrest
- Cardiogenic Shock
- Respiratory Arrest
- Ventricular Fibrillation
- Other Shock w/o Trauma



ANY AMOUNT OF MYOCARDIAL NECROSIS CAUSED BY ISCHEMIA SHOULD BE LABELED AS MI

**DOCUMENT SPECIFICITY TO GET CREDIT
FOR SEVERITY OF ILLNESS!**

SECONDARY DIAGNOSES	
MCC Examples	CC Examples
Acute (or Acute on Chronic) Systolic or Diastolic Heart Failure	Acute Myocardial Ischemia without MI
Acute Cor Pulmonale	Unstable Angina
Acute MI	Atrial Fibrillation—Persistent
Acute Myocarditis	Atrial Flutter
Acute Pulmonary Embolism	Angina with CAD of Bypass Graft when graft type specified as autologous vein, artery
CVA / Stroke / Cerebral Infarct	Chronic Heart Failure—specified as systolic or diastolic; Left Heart Failure
Acute Pancreatitis	Endocarditis
Pneumonia— <i>most types except VAP</i>	Hypertensive Encephalopathy
HIV Disease	Hypertensive Emergency, Hypertensive Crisis
Acute Respiratory Failure	In-Stent Stenosis (Cardiac Stent); Stent Jail
Sepsis, Severe Sepsis, Septic Shock	Pleural Effusion
Pressure Ulcer—Stage 3 or 4	Post MI Syndrome / Postinfarction Angina
Severe Malnutrition	Block—Complete AV, Trifascicular, Bilateral Bundle Branch Block
Acute Renal Failure with Tubular Necrosis	Tachycardia Paroxysmal Supraventricular
End Stage Renal Disease	Thrombophlebitis & Venous Thrombosis
Coma	Cardiomyopathy (except Ischemic)
Diabetic Ketoacidosis, Diabetes w/ Hyperosmolarity or Other Coma	Dementia with Behavioral Disturbance
Encephalopathy-Metabolic, Toxic, Other or Un-spec	Acute Renal Failure / Acute Kidney Injury Chronic Kidney Disease—Stage 4 or 5
GI Disorder with Hemorrhage	COPD with Acute Exacerbation

References:

*Payments calculated based on a hospital specific rate of \$5,500.

Adapted from *Antman EM, Braunwald E. Acute myocardial infarction. In: Braunwald EB, ed. Heart disease: a textbook of cardiovascular medicine. Philadelphia, PA:WB Saunders, 1997.*

Patients with NSTEMI usually present with angina at rest. Adapted from *Braunwald E. Unstable angina: a classification. Circulation 1989, 80:410-4. Circulation 1989; 80:410-4*

Braunwald ET AL., Management of Patients with Unstable Angina and Non-ST-Segment Elevation Myocardial Infarction Update Adapted with permission from Campeau L. Grading of angina pectoris (letter). *Circulation* 1976;54:522-3. ©1976. American Heart Association, Inc. www.acc.org/clinical/guidelines/unstable/update_index.html

Thygesen, Alpert & White. Third Universal Definition of Myocardial Infarction. Circulation. August, 2012.

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