Myocardial infarction
ICD-10-CM
Clinical overview

Disclaimer
This document is intended for physicians and office staff. The information here is not intended to serve as official coding or legal advice.

All coding should be considered on a case-by-case basis and should be supported by medical necessity and the appropriate documentation in the medical record.

Definition
A myocardial infarction is a condition in which an artery that supplies blood to the heart is blocked, cutting off the supply of oxygen and nutrients to that area of the heart. As a result, the affected heart tissue dies or is permanently damaged.

Causes
- Atherosclerosis of the coronary arteries, where fatty plaques that build up inside the coronary arteries block blood flow or cause blood clots
- Blood clots
- Sudden severe stress
- Spasms of the coronary arteries

Risk factors
- Age (risk increases with advancing age)
- Gender (male)
- Diabetes mellitus
- Genetic or hereditary factors
- High blood pressure/hypertension
- Smoking
- High-fat diet
- High cholesterol and triglycerides
- Lack of exercise
- Obesity
- Illicit drug use

Signs and symptoms
There may be no signs or symptoms ("silent" myocardial infarction). When they do occur, the most common signs and symptoms include:
- Chest pain (heaviness, pressure, feeling of a tight band around chest, etc.); pain may radiate to jaw, neck, arm or back
- Indigestion
- Abdominal pain
- Anxiety or feeling of impending doom
- Nausea and vomiting
- Shortness of breath
- Rapid or irregular heartbeat
- Fatigue or lightheadedness
- Sweating

Complications
- Arrhythmias (irregular or abnormal heart rhythms)
- Heart failure
- Cardiomyopathy
- Heart rupture
- Heart valve problems
- Blood clot to lungs (pulmonary embolism) or brain (stroke)

Diagnostic tools
- Medical history and physical exam
- Chest X-ray
- Blood tests
- Electrocardiogram (ECG or EKG)
- Echocardiogram
- Coronary angiography (cardiac catheterization)
- Exercise stress tests
- Computed tomography (CT scans) and Magnetic resonance imaging (MRI)
- Nuclear scans

Treatment
- Medications (anticoagulants or thrombolytics, pain relievers, nitroglycerin, beta blockers, angiotensin-converting enzyme inhibitors, cholesterol-reducing agents)
- Oxygen therapy
- Surgical intervention (coronary angioplasty and stenting, coronary artery bypass grafting)

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Best documentation practices for physicians

Subjective

In the subjective section of the medical record, document any current complaints that are directly related to current acute myocardial infarction or old/historical myocardial infarction.

Objective

The objective section should include any abnormal cardiovascular exam findings. Document results of diagnostic testing. Include the absence or presence of ST elevation on ECG/EKG tracing.

Assessment/impression

Specificity: The myocardial infarction diagnosis should be spelled out in full and described to the highest level of specificity (site/location, type, presence or absence of ST elevation, dates/timelines).

Abbreviations:
- Limit – or avoid altogether – the use of acronyms and abbreviations. While "MI" is a commonly accepted medical abbreviation for myocardial infarction, this abbreviation has other meanings related to cardiac conditions (for example, mitral insufficiency and mitral incompetence).
- The meaning of an abbreviation can often be determined based on context, but this is not always true. Best practice is to document myocardial infarction by spelling it out in full with all relevant descriptors.

Site/location and type:
- Document the site or location within the heart of the myocardial infarction, such as anterolateral wall, inferoposterior wall, lateral wall, subendocardial, etc., and the particular coronary artery(ies) involved.
- Specify the type, for example: ST elevation myocardial infarction (STEMI) or non-ST elevation myocardial infarction (NSTEMI); Type 1, 2, 3, 4a, 4b, 4c or 5; intraoperative, postoperative; subsequent.

Dates/timelines:

Clearly document specific timelines or dates associated with myocardial infarction, as this influences ICD-10-CM code assignment.
- A myocardial infarction that occurred four weeks ago or less is coded as an acute myocardial infarction (ICD-10-CM category I21, Acute myocardial infarction). Encounters after the four-week time frame but with the patient still receiving care related to the myocardial infarction are reported with "aftercare" codes (rather than a code from category I21).
- A myocardial infarction that occurred more than four weeks ago with no current symptoms directly

associated with that myocardial infarction and requiring no current care is coded as an "old" or historical myocardial infarction (code I25.2, Old myocardial infarction).
- Avoid use of vague descriptions (such as "recent" myocardial infarction), as these descriptions do not specify whether the myocardial infarction occurred less than or more than four weeks ago. If describing myocardial infarction as "recent," best practice is to include the specific date, as in "recent myocardial infarction on June 1, 20XX."

Plan
- Document a clear and concise treatment plan for acute or historical myocardial infarction, including orders for diagnostic testing
- Clearly link the myocardial infarction diagnosis to medications being used to treat the condition
- Document to whom/where referrals or consultation requests are made
- Include the date of the patient's next appointment

Myocardial infarction diagnosed on electrocardiogram (ECG/EKG) or other special investigation

Many diagnostic tests, including ECG or EKG, are performed using sophisticated computer technology that includes the computer software's own diagnostic interpretation of the test results. The office note should clearly document the physician's own interpretation of test results and not simply a "cut-and-paste" of the computer software's diagnostic interpretation.

Electronic health record (EHR) issues

Other and unspecified codes with descriptions:

Some electronic health records (EHRs) insert ICD-10-CM codes with corresponding descriptions into the assessment section of the office note in place of a provider-stated final diagnosis. For example:

"I21.A9 Other myocardial infarction type"
"I21.9 Acute myocardial infarction, unspecified"

These are vague descriptions and incomplete diagnoses.
- Codes titled "other" or "other specified" are for use when the medical record provides a specific diagnosis description for which a specific diagnosis code does not exist.
- The "other" ICD-10-CM code with description should not be used, by itself, as a final diagnosis without clear documentation that specifies the particular "other" type of myocardial infarction such as "myocardial infarction type 2."

- Unspecified diagnosis descriptions should be used only when sufficient clinical information is not known or available to the provider at the time of the encounter.

Mismatch between final diagnostic statement and EHR-inserted diagnosis code with description:
Another scenario that causes confusion is one in which the assessment section documents a provider-stated diagnosis *PLUS* an EHR-inserted diagnosis code with description that does not match – or may even contradict – the stated diagnosis. Example:

> **Assessment: Acute myocardial infarction**
>
> I21.11 ST elevation (STEMI) myocardial infarction involving right coronary artery

Here the final diagnosis **in bold** is "Acute myocardial infarction" with no other specification, which codes to I21.9, Acute myocardial infarction, unspecified.

The EHR-inserted diagnosis code with description that follows is "I21.11 ST elevation (STEMI) myocardial infarction involving right coronary artery"; however, no information was found elsewhere in the record that supports this specificity. This leads to confusion regarding which diagnostic statement is correct.

To avoid confusion and ensure accurate diagnosis code assignment, the provider's stated final diagnosis must either:
a) Match the code with description; OR
b) Classify in ICD-10-CM to the EHR-inserted diagnosis code with description.

Note: ICD-10-CM is a statistical classification; it is not a substitute for a healthcare provider's final diagnostic statement. It is the provider's responsibility to provide legible, clear, concise and complete documentation of each final diagnosis described to the highest level of specificity, which is then translated to a code for reporting purposes. It is not appropriate for healthcare providers to simply list a code number or select a code number from a list of codes in place of a written final diagnosis.

Reference: AHA Coding Clinic, Code Number in Lieu of a Diagnosis, Fourth quarter 2015, pages 34-35

Coding basics

ICD-10-CM code assignment for myocardial infarction is based on the specific description and details documented in the individual medical record. To ensure accurate code assignment, coders must carefully review:

a) The specific medical record description of myocardial infarction
b) The alphabetic index entries and all subterms
c) The code descriptions in the tabular list, including all instructional notes

ST elevation at a glance

ST elevation myocardial infarction (STEMI) is a myocardial infarction that shows a certain change in the ECG or EKG tracing – specifically, a portion of the EKG called the ST segment is elevated above baseline.
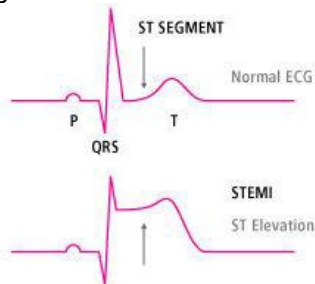
- STEMI occurs when a blood clot forms suddenly, completely blocking an artery in the heart. This can result in damage that covers a large area of the heart and extends deep into the heart muscle.

- Non-ST elevation myocardial infarction (NSTEMI) is a myocardial infarction in which the EKG tracing does NOT show elevation of the ST segment above baseline. With NSTEMI, damage does not extend through the full depth of the heart muscle.

- Note: Documentation of ST elevation on EKG by itself with no mention of acute myocardial infarction is not coded as acute myocardial infarction. Medical conditions other than acute MI can cause ST elevation. Also, for some people, ST elevation on an EKG may be a normal variant.

Subtypes of acute myocardial infarction

The ICD-10-CM classification provides codes for the different subtypes of acute myocardial infarction (AMI).

- **Type 1:** A spontaneous MI due to acute coronary atherothrombotic myocardial injury with either atherosclerotic plaque rupture or erosion and often, associated thrombosis.
  - ICD-10-CM codes for Type 1 acute myocardial infarction (AMI) identify the site, such as anterolateral wall or true posterior wall.

  - Type 1 STEMI classifies to subcategories I21.Ø – I21.2 and code I21.3.

  - Type 1 NSTEMI and nontransmural MIs classify to code I21.4, Non-ST elevation myocardial infarction.
  - Type 1 myocardial infarction with no further specification codes to I21.9.
  - If a Type 1 NSTEMI evolves to STEMI, assign the STEMI code.
  - If a Type 1 STEMI converts to NSTEMI due to thrombolytic therapy, it is still coded as STEMI.

- **Type 2:** An MI with evidence of acute myocardial ischemia in patients who do not have acute coronary atherothrombotic injury but instead have oxygen supply-demand imbalance from other reasons.
  - Type 2 MI codes to I21.A1, Myocardial infarction Type 2, with the underlying cause coded first.
  - Do not assign code I24.8, Other forms of acute ischemic heart disease, for the demand ischemia.
  - When a Type 2 AMI code is described as NSTEMI or STEMI, only assign code I21.A1. (Codes I21.Ø1 – I21.4 should be assigned only for Type 1 AMIs).

- **Types 3, 4a, 4b, 4c and 5 are assigned to code I21.A9, Other myocardial infarction type**
  - **Type 3:** MI with characteristic symptoms of myocardial ischemia but cardiac biomarker values in the blood are unavailable due to a) death occurs before blood for cardiac biomarker determination can be obtained; or b) the patient dies soon after the onset of symptoms before an elevation of biomarker values has occurred; or c) there is sudden death with evidence of MI by autopsy.
  - **Type 4a:** Myocardial infarction related to percutaneous coronary intervention (PCI)
  - **Type 4b:** Myocardial infarction related to stent thrombosis
  - **Type 4c:** Myocardial infarction due to restenosis 50 percent or greater after an initially successful PCI
  - **Type 5:** Myocardial infarction related to coronary artery bypass grafting (CABG)

"Code also" and "Code first" notes should be followed related to complications, and for coding of post-procedural myocardial infarctions during or following cardiac surgery.

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Tips and resources for coders

Acute myocardial infarction – vague descriptions

- Code I21.9 – Acute myocardial infarction, unspecified is the default for acute myocardial infarction with no further description or unspecified type.
- When there is no information regarding the type of MI, type 1 is the default. (The coding manual shows myocardial infarction with no other specification and type 1 myocardial infarction both default to I21.9).
- If only Type 1 STEMI or transmural MI without the site is documented, assign code I21.3, ST elevation (STEMI) myocardial infarction of unspecified site.
- If an acute myocardial infarction is documented as nontransmural or subendocardial, but the site is provided, it is coded as a subendocardial AMI.
- Acute myocardial infarction specified by site (except for subendocardial and nontransmural), but not specified as STEMI or NSTEMI, should be coded to acute STEMI by site. (Reference: AHA Coding Clinic – Acute MI not specified as STEMI or NSTEMI, First Quarter 2013, pages 25-26.)

Subsequent acute myocardial infarction

- A code from category I22, Subsequent ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction, is used when a patient who has suffered a Type 1 or unspecified AMI has a new AMI within the four-week time frame of the initial AMI.
- A code from category I22 must be used in conjunction with a code from category I21. The sequencing of the I22 and I21 codes depends on the circumstances of the encounter.
- Do not assign code I22 for subsequent myocardial infarctions other than Type 1 or unspecified.
- For subsequent Type 2 AMI, assign only code I21.A1.
- There is no subsequent Type 3 myocardial infarction, as Type 3 refers to myocardial infarction resulting in death when biomarker values are unavailable.
- For subsequent Type 4 or Type 5 AMI, assign only code I21.A9.
- If a subsequent myocardial infarction of one type occurs within four weeks of a myocardial infarction of a different type, assign the appropriate codes from category I21 to identify each type. Do not assign a code from category I22. Codes from category I22 should only be assigned if both the initial and subsequent myocardial infarctions are Type 1 or unspecified.

Current complications following myocardial infarction

Complications that occur within the 28 day period following acute myocardial infarction classify to category I23 as follows:

I23.Ø	Hemopericardium
I23.1	Atrial septal defect
I23.2	Ventricular septal defect
I23.3	Rupture of cardiac wall without hemopericardium
I23.4	Rupture of chordae tendineae
I23.5	Rupture of papillary muscle
I23.6	Thrombosis of atrium, auricular appendage, and ventricle
I23.7	Postinfarction angina
I23.8	Other current complications

A code from category I23 must be used with a code from category I21 or category I22, with sequencing determined by the circumstances of the admission:

- If the complication of the MI is the reason for the encounter, the I23 code will be sequenced first.
- If the complication of the MI occurs during the encounter for the MI, the I23 code will be sequenced after the I21 or I22 code.

Old myocardial infarction

Code I25.2 for old myocardial infarction is assigned when a medical record specifically describes the myocardial infarction as follows:

- Diagnosed on ECGbut presenting no symptoms
- Healed or old
- Past (diagnosed on ECG or other investigation but currently presenting no symptoms)
- With a stated duration of more than four weeks (and no longer receiving care)
- Older than four weeks (and no longer receiving care)
- Personal history of

Diagnosed on ECG or other special investigation means the physician's own interpretation of the ECG/EKG or other diagnostic test results (and not simply a "cut-and-paste" of the diagnostic testing machine's computer software interpretation that has not been reviewed and verified by the physician).

Currently presenting no symptoms means the medical record does not document any current symptoms that are described as specifically related to the old myocardial infarction.

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Tips and resources for coders

Coding examples

Example 1	
Final diagnosis	Arteriosclerotic heart disease, inferior myocardial infarction six months ago. Doing well. Continue current meds.
ICD-10-CM code(s)	I25.1Ø Atherosclerotic heart disease of native coronary artery without angina pectoris I25.2 Old myocardial infarction

Example 2	
Medical record documentation	Patient presents to cardiologist's office for post-hospital evaluation: 76-year-old male admitted to XYZ Medical Center three weeks ago with complaints of chest pain. Was noted to have acute lateral wall myocardial infarction and had an angioplasty with placement of stent in the mid-circumflex artery. Recommendation is to continue cardiac rehab.
ICD-10-CM code(s)	I21.29 ST elevation (STEMI) myocardial infarction involving other sites Z95.5 Presence of coronary angioplasty implant and graft

Example 3	
Medical record documentation	Patient was transferred by ambulance to the cath lab here at Heart and Lung Center after presenting to the ER at Memorial Hospital earlier this morning. ER reports patient had complaints of chest pressure, sweating and nausea. ER physician noted that the EKG showed a new acute ST-elevation myocardial infarction involving a diagonal coronary artery. Transfer records indicate tPA (tissue plasminogen activator) was administered by the ER
ICD-10-CM code(s)	I21.Ø2 ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery Z92.82 Status post administration of tPA (rtPA) in a different facility within the last 24 hours prior to admission to current facility

Example 4	
Medical record documentation	After emergency room evaluation, a patient was admitted to Memorial Hospital with a diagnosis of acute anterior wall myocardial infarction. There was no history of previous infarction or previous care for this episode. During the hospital stay, the patient experienced a second acute anterolateral infarction.
ICD-10-CM code(s)	I21.Ø9 ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall I22.Ø Subsequent ST elevation (STEMI) myocardial infarction of anterior wall

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Example 5	
Medical record documentation	A patient was discharged from Memorial Hospital after treatment for a Type 1 acute myocardial infarction involving the right coronary artery. Today, exactly two weeks later, the patient is readmitted with a non-ST elevation Type 2 acute myocardial infarction determined to be due to supraventricular tachycardia.
ICD-10-CM code(s)	I47.1 Supraventricular tachycardia I21.A1 Myocardial infarction Type 2 I21.11 ST elevation (STEMI) myocardial infarction involving the right coronary artery

Example 6	
Medical record documentation	A cardiac patient presented to the emergency department with extreme difficulty breathing. He was found to be in congestive heart failure with high risk for impending myocardial infarction. Percutaneous transluminal coronary angioplasty (PTCA) was performed; despite this, during this same admission the patient went on to have an acute inferolateral myocardial infarction.
ICD-10-CM code(s)	I21.19 ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall I5Ø.9 Heart failure, unspecified

Example 7	
Medical record documentation	Chief complaint: "Cardiology follow-up." Review of systems and physical exam are noted as unremarkable. Final impression documents "recent" myocardial infarction with a total occlusion of the right coronary artery, 60 percent left anterior descending artery, 50 percent circumflex lesion. There is no mention of a date or timeline related to myocardial infarction.
ICD-10-CM code(s)	Query the physician for clarification regarding the specific date, type and site of the inferior myocardial infarction. Documentation is vague and does not provide sufficient information for accurate diagnosis code assignment.

Example 8	
Medical record documentation	Past medical history includes myocardial infarction, which is not mentioned anywhere else in the medical record.
ICD-10-CM code(s)	I25.2 Old myocardial infarction

References: American College of Cardiology; American Heart Association; American Hospital Association Coding Clinic; ICD-10-CM and ICD-10-PCS Coding Handbook; ICD-10-CM Official Guidelines for Coding and Reporting; Mayo Clinic; MedlinePlus; National Heart, Lung, and Blood Institute; WebMD

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