What is a Myocardial Infarction (MI)?
A myocardial infarction (MI), commonly known as a heart attack, occurs when a portion of the heart is deprived of oxygen due to blockage of a coronary artery. Coronary arteries supply the heart muscle with oxygenated blood. Without oxygen, muscle cells served by the blocked artery begin to die. Injury to the heart muscle causes chest pain and chest pressure sensation. If blood flow is not restored to the heart muscle within 2 to 40 minutes, irreversible death of the heart muscle will begin to occur. Muscle continues to die for six to eight hours at which time the heart attack usually is "complete." The dead heart muscle is eventually replaced by scar tissue.

What may cause a Myocardial Infarction (MI)?
Occlusive intracoronary thrombus - a substance called plaque can build up in the walls of your coronary arteries. This plaque is made up of cholesterol and protein. If the plaque builds up to a certain size, it can block the blood supply to the heart muscle. This can cause a heart attack, also called "infarction." The dead heart muscle is eventually replaced by scar tissue.

Types of Myocardial Infarctions
ST Elevation Myocardial Infarction (STEMI) or Transmural Acute MI, is associated with atherosclerosis involving a major coronary artery. It can be subclassified into anterior, inferior, lateral, or septal. STEMI extends through the entire thickness of the heart muscle and are usually a result of complete occlusion of the blood supply. ST elevation and Q waves are seen on electrocardiogram (EKG).

Non ST Elevation Myocardial Infarction (NSTEMI) [May also be called a Subendocardial Acute MI, or a Non Transmural MI, or a Non-Q Wave MI] is of smaller area in the subendocardial wall of the left ventricle, ventricular septum, or papillary muscles. NSTEMI does not extend through the walls of the heart muscle. The subendocardial area is particularly susceptible to ischemia. ST depression is seen on ECG.

Types of possible treatments for a STEM:
- Thrombolysis using tissue plasminogen activator (tPA) administered intravenously:
  - Reteplase
  - Alteplase
  - Tenecteplase
- Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement:
- Coronary artery bypass graft (CABG)

Types of possible treatments for a NSTEMI:
- Medication to protect the heart and reduce its workload:
  - Beta blockers
  - Nitroglycerin
  - Positively an alpha-convertase enzyme (ACE) inhibitor or angiotensin receptor blocker
- One or more anti-clotting medications (e.g. heparin) to prevent blood clots from forming:
- Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement

ICD-10-CM Index
- Infarct, infarction
  - myocardium, myocardial (acute) with duration of 4 weeks or less (I21.3)
  - ST elevation (STEMI) (I21.3)
  - anterior (anteroapical)
  - left circumflex coronary artery (I21.129)
  - inferior (inferolateral) (anteroseptal) (Q wave) NEC (I21.19)
  - inferior (I21.1)
- subsequent (STEMI) (I21.19)

ICD-10-CM Official Guidelines for Coding and Reporting FY 2015
Acute myocardial infarction (AMI)
1) ST elevation myocardial infarction (STEMI) and non ST elevation myocardial infarction (NSTEMI)
The ICD-10-CM codes for acute myocardial infarction (AMI) identify the site, such as anterolateral wall or posterior wall. Subcategories (I21.0-I21.2 and code I21.3 are used for ST elevation myocardial infarction (STEMI). Code I21.4, Non-STEMI myocardial infarction, is used for non ST elevation myocardial infarction (NSTEMI) and nontransmural MI.

If NSTEMI evolves to STEMI, assign the STEMI code. If STEMI converts to NSTEMI due to thrombolytic therapy, it is still coded as STEMI.

For encounters occurring while the myocardial infarction is equal to, or less than, four weeks old, including transfers to another acute setting or a postacute setting, and the patient is receiving treatment for the myocardial infarction, codes from category I21 may continue to be reported. For encounters after the six week time frame and the patient is still receiving care related to the myocardial infarction, the appropriate code should be used eight to ten days after initial MI code from category I21. For old or healed myocardial infarctions not requiring further care, code I22.5, Old myocardial infarction, may be assigned.

2) Acute myocardial infarction, unspecified
Code I21.3, ST elevation (STEMI) myocardial infarction of unspecified site, is the default for unspecified acute myocardial infarction. If only STEMI or transmural MI without the site is included, assign I21.3.

3) AMI documented as nontransmural or subendocardial but site provided
If an AMI is documented as nontransmural or subendocardial, but the site provided, it is still coded as a subendocardial AMI.

4) Subsequent acute myocardial infarction
- MI involves a small area in the subendocardial wall of the left ventricle, is to be used when a patient who has suffered an AMI has a new AMI within the 4 week time frame of the initial AMI. A code from category I21 must be used in conjunction with a code from category I22. The sequencing of the I22 and I21 codes depends on the circumstances of the encounter.

What does the coder need to know to code a myocardial infarction?
- Is there documentation of STEMI or NSTEMI?
- Is a site given?
- If a site is given, but no information as to STEMI or NSTEMI, code to STEMI by site.
- If a site is given, use AHA Coding Clinic for ICD-10-CM and ICD-10-PCS 1st Quarter 2013 pages 25-26
- Is the patient admitted with an initial MI or a subsequent MI?
- What is the time frame of onset of the MI or subsequent MI?

Example 1:
Patient presents with a chief complaint of chest pain admitted to Coronary Care Unit due to acute inferior myocardial infarction. I21.19

HISTORY OF PRESENT ILLNESS: The patient is a 40-year-old white male who presented with a chief complaint of "chest pain."

REVIEW OF SYSTEMS: All other systems reviewed & are negative.

TREATMENT: Heparin lock 2,000. Lab: Nasal cannula oxygen 3 liters/minute. Aspirin 50 mg PO q4h, 80mg PO Swallow. Nitroglycerin drip at 30 micrograms/minute. Cardiac monitor

TFR 90 minute protocol. Magnapin

IMPRESSION: Acute Inferior STEMI

Example 2:
The same patient presents with a chief complaint of chest pain and is admitted to Coronary Care Unit due to acute NSTEMI. I22.1 and I21.9

HISTORY OF PRESENT ILLNESS: The patient is a 40-year-old white male who presented with a chief complaint of "chest pain."

The patient was discharged from the hospital last week after treatment for an Acute Inferior STEMI suffering ten (10) day ago.

REVIEW OF SYSTEMS: All other systems reviewed & are negative.

TREATMENT: The patient was given nifedipine 10 mg p.o., nasal oxygen at 3 liters by nasal cannula. Morphine sulfate was given, 2 mg i.v.

IMPRESSION: Acute STEMI

Note: This is a subsequent MI occurring within 4 weeks of an initial MI. Guidelines state, "A code from category I22, Subsequent ST elevation (STEMI) and non ST elevation myocardial infarction, is to be used when a patient who has suffered an AMI has a new AMI within the 4 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. Therefore two codes will be needed to fully capture this encounter, a code from I22 for the new, subsequent, MI, and a code from I21 for the initial MI occurring ten days previously.

Remind to ask yourself:
- Is there documentation of STEMI or NSTEMI?
- Is a site given?
- If a site is given, but no information as to STEMI or NSTEMI, code to STEMI by site.
- What is the time frame of onset of the MI or subsequent MI?
- Be guided by the documentation in the medical record to determine the correct codes and the appropriate sequencing of the codes.