# Pattern of Cardiac Enzymes in heart disease

Dr. Praveen Katiyar

# Cardiac Enzymes

- Cardiac enzymes are markers found in the blood.
- They are tested when Myocardial Infarction (MI) is suspected.
- The markers are normally present at all times, however, they are significantly elevated during a damage of the heart muscle.

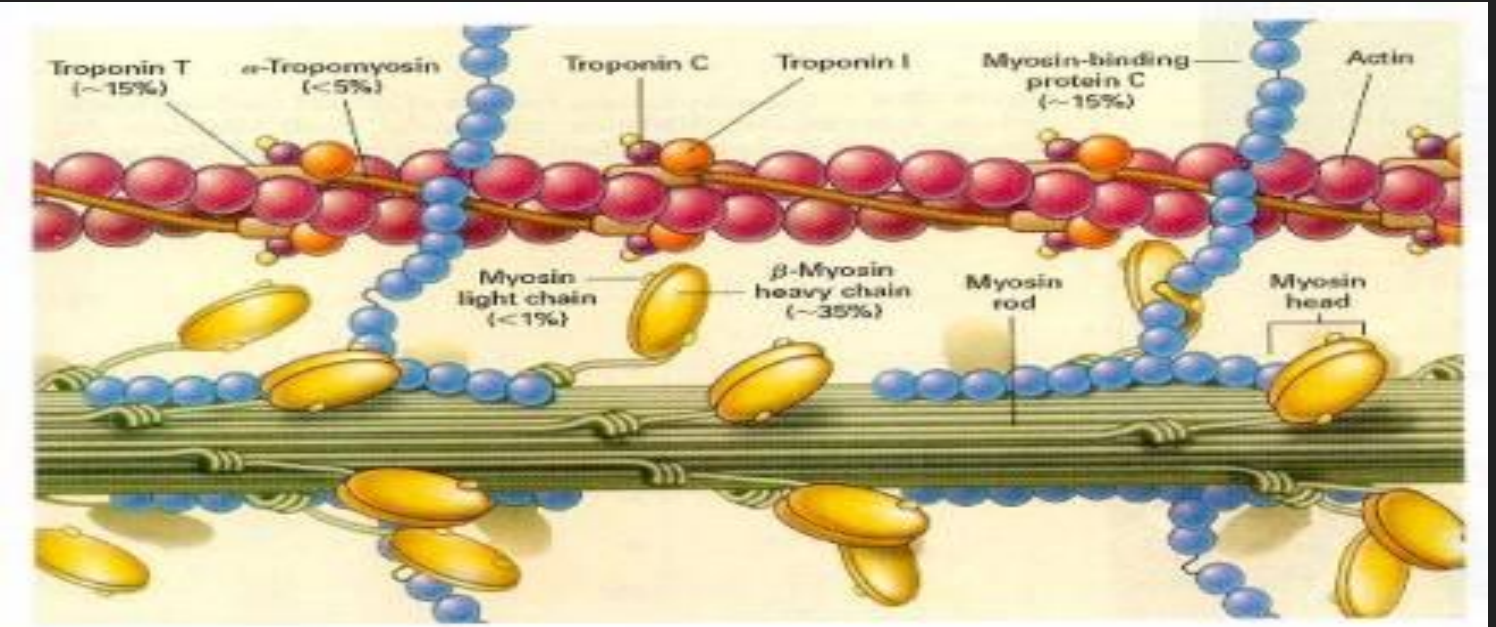
# Cardiac Enzymes

- If Myocardial Infarction is suspected, enzyme markers are drawn several times usually six hours apart.
- They are few different enzymes and their levels are elevated hours after the initial heart damage.

# Cardiac Enzymes

- Troponin– contractile protein, two types:
- Troponin T found in the cardiac and skeletal muscle, elevated during kidney and skeletal muscle damage, early rise after 3-4 hours, peak is 24 hours.
- Troponin I found only in cardiac muscle, more specific but rises later,4-6 hours, peak is at 18 hours.

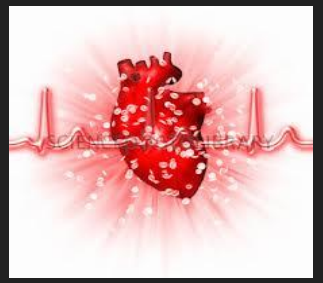
# Cardiac Enzymes




- Picture of Troponin

# Cardiac Enzymes

- Creatine Phosphokinase (CK-MB) is highly specific test for MI, elevation of 4% and higher indicate MI.
- The time to rise is 4-6 hours, time to peak is 24 hours.



# Cardiac Enzymes

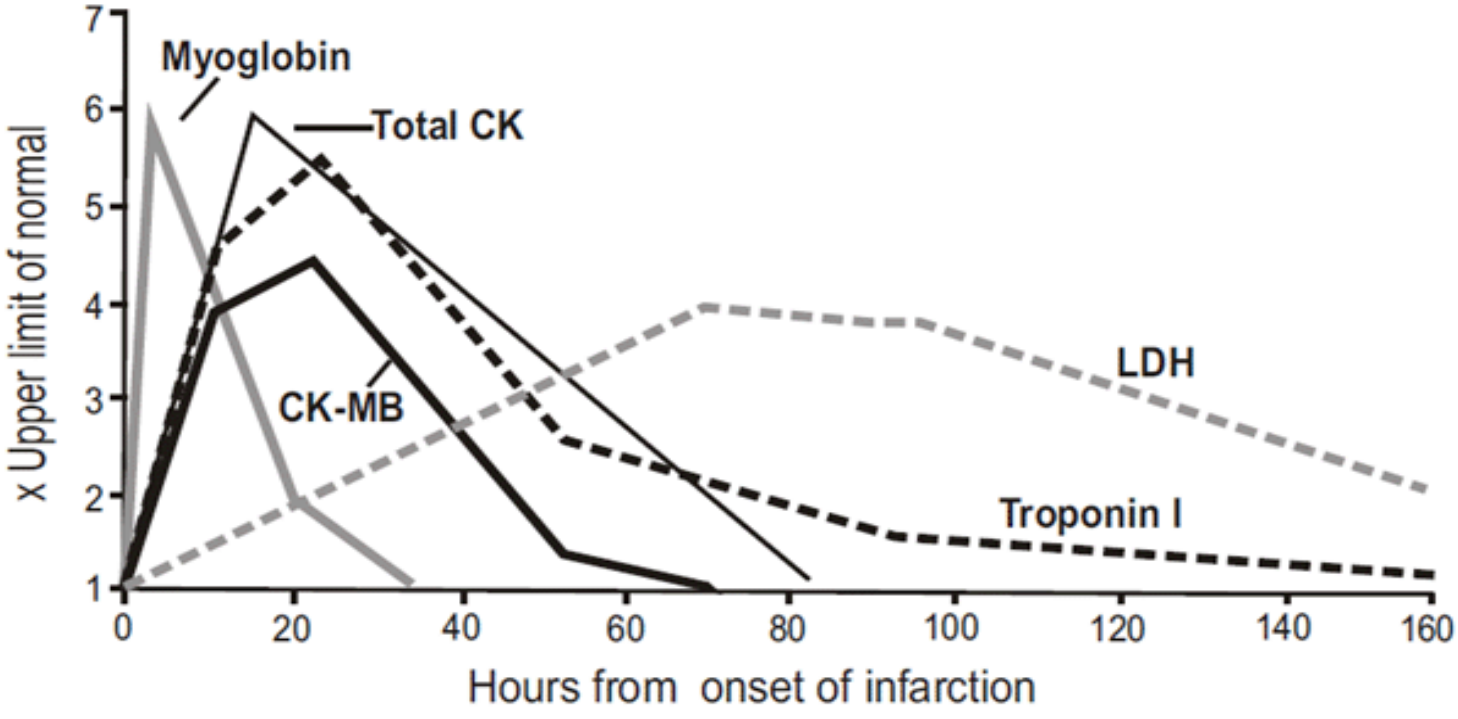
- Lactic dehydrogenase(LDH), there is LDH1 and LDH2, normally LDH2 is greater than LDH1, if LDH1 is greater than LDH2 than the person is positive for MI.
- However increase in level occurs 48 to 72 hrs after the onset of symptoms.

# Cardiac Enzymes

- Myoglobin is a muscle protein with high sensitivity , but low specificity (can be elevated during other muscle injuries).
- Time to rise is 1-4 hours
- Peak time 6-12 hours

# Cardiac Enzymes

Figure 1: Cardiac Marker Pattern Associated with Myocardial Infarction (5)



# Cardiac Enzymes

- The graph represent the elevation of the different cardiac enzymes during Myocardial Infarction in the hours after the injury. However, Electrocardiogram is also necessary  along with consideration of the signs and symptoms during the MI in order to determene if the patient is having a MI.