Patient with Chest Pain
Or Potential
Acute Coronary Syndrome

STEMI, Non-STEMI, Chest Pain?

Follow MN STEMI Guideline
Follow MN Non-STEMI Guideline
Follow MN ED Chest Pain Guideline

This ACS/Chest Pain "Tool-Kit" was created with coordination from the Minnesota Department of Health, in conjunction with the American Heart Association Minnesota Mission: Lifeline™ Workgroup. This information is intended only as a guideline. Please use your best judgement or newly published literature in the treatment of patients. The Minnesota Department of Health is not responsible for inaccuracies contained herein.

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Final Draft: June 12th, 2018
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STEMI (ST Elevation Myocardial Infarction) Diagnostic Criteria:

- ST elevation at the J point in at least 2 contiguous leads of ≥ 2 mm (0.2 mV) in men or ≥ 1.5 mm (0.15 mV) in women in leads V2–V3 and/or of ≥ 1 mm (0.1 mV) in other contiguous chest leads or the limb leads
- Signs & symptoms of discomfort suspect for AMI (Acute Myocardial Infarction) or STEMI with a duration > 15 minutes < 12 hours
- Although new, or presumably new, LBBB at presentation occurs infrequently and may interfere with ST-elevation analysis, care should be exercised in not considering this an acute myocardial infarction (MI) in isolation... If in doubt, immediate consultation with PCI receiving centers is recommended
- ECG demonstrates evidence of ST depression suspect of a Posterior MI... consult with PCI receiving center
- If initial ECG is not diagnostic but suspicion is high for STEMI, obtain serial 12 Lead ECG’s at 5-10 minute intervals

Pre-Hospital STEMI confirmed by 12 Lead ECG trained ALS EMS, recognize ST segment elevation of ≥ 1 mm in 2 contiguous leads, confirmed interpretation of STEMI transmitted, or ECG monitor interpretive statement infers: "Acute Myocardial Infarction" with pt. signs & symptoms suspect of AMI

**Absolute Contraindications for Fibrinolysis**

- Chest Pain / Symptom Onset > 12 hours
- Suspected aortic dissection
- Any prior intracranial hemorrhage
- Strudural cerebral vascular lesion or malignant intracranial neoplasm
- Any active bleeding (excluding menses)
- Ischemic stroke within 3 months
- Significant closed-head or facial trauma within 3 months
- Pregnancy

**Relative Contraindications for Fibrinolysis**

- Chest Pain / Symptom Onset > 6 hours
- Current use of oral anticoagulants (Warfarin, Rivaroxaban, Apixaban, etc.)
- Uncontrolled hypertension on presentation (SBP > 180 or DBP > 90 mmHg)
- History of ischemic stroke more than 3 months, dementia, or known intracranial pathologies not covered in contraindications
- Traumatic or prolonged CPR (over 10 minutes)
- Major surgery within last 3 weeks
- Recent internal bleeding (within last 2-4 weeks)

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**Tenecteplase (TNKase) Dosing Chart**

<table>
<thead>
<tr>
<th>Patient Weight</th>
<th><strong>FULL-DOSE</strong></th>
<th><strong>HALF-DOSE</strong></th>
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<tbody>
<tr>
<td>59 kg or less</td>
<td>30 mg = 6 mL</td>
<td>15 mg = 3 mL</td>
</tr>
<tr>
<td>60 - 69 kg</td>
<td>35 mg = 7 mL</td>
<td>18 mg = 3.5 mL</td>
</tr>
<tr>
<td>70 - 79 kg</td>
<td>40 mg = 8 mL</td>
<td>20 mg = 4 mL</td>
</tr>
<tr>
<td>80 - 89 kg</td>
<td>45 mg = 9 mL</td>
<td>23 mg = 4.5 mL</td>
</tr>
<tr>
<td>90 kg or more</td>
<td>50 mg = 10 mL</td>
<td>25 mg = 5 mL</td>
</tr>
</tbody>
</table>

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**AHA Mission: Lifeline STEMI Recommendations:**

- FMC (First Medical Contact)-to-First ECG time ≤ 10 minutes unless pre-hospital ECG obtained
- All eligible STEMI patients receiving a Reperefusion Therapy (Primary PCI or fibrinolysis)
- Fibrinolytic elgible STEMI patients with Door-to-Needle time ≤ 30 minutes
- Primary PCI eligible patients transferred to a PCI receiving center with referring center Door-in - Door out (Length of Stay) ≤ 45 min
- Referring Center ED or Pre-Hospital First Medical Contact-to-PCI time ≤ 120 minutes (including transport time)
- All STEMI patients without a contraindication receiving Aspirin prior to referring center ED discharge

Notes:

Page 2 of 2  Updated 6/13/18 (Original 10-2014)
Minnesota Mission: Lifeline EMS STEMI Transport Guideline

Obtain 12 L ECG with Initial Assessment & Vital Signs

**Goal:** First Medical contact to ECG ≤ 10 min, Scene time: ≤ 15 minutes

-to provide early identification and pre-hospital arrival notification for suspected myocardial infarction or STEMI.

- Chest pain, pressure, tightness or persistent discomfort above the waist in pts. ≥ 35 yrs. of age
- "Heartburn" or epigastric pain
- Complaints of “heart racing” (HR >150 or irregular and >120) or “heart too slow” (HR < 50 and symptomatic)
- A syncopal episode, severe weakness, or unexplained fatigue
- New onset stroke symptoms (< 24 hours old)
- Difficulty breathing or shortness of breath (with no obvious non-cardiac cause)
- ROSC (return of spontaneous circulation) post cardiac arrest
- Recent Cocaine, stimulant and/or other Illicit drug use (patients of any age)

*If initial ECG is not diagnostic but suspicion remains high for ACS (acute coronary syndrome) and symptoms persist, obtain serial ECG’s at 5-10 minute intervals*

Pre-Hospital STEMI ALERT Activation Criteria:

**Goal:** Identify potential ACS patents, Recognize STEMI, Alert Receiving Facility

Activate STEMI Alert when any **one** or more of the following criteria are met and patient demonstrates signs & symptoms suspect of (AMI) acute myocardial infarction as described above with a duration of ≥15 minutes <24 hours

1. EMS personnel trained in 12 L ECG interpretation recognize ST segment elevation of ≥ 1 mm in 2 contiguous leads
2. Interpretation of ECG transmitted and reviewed by a provider (Physician, NP, PA) confirmed to be diagnostic of STEMI

Determine Transport Destination

- **Transport time estimated to be ≤ 60 minutes**
  - Goal FMC to PCI ≤ 120 minutes
  - Notify medical control of STEMI and consider transport via the most expedient method available to the nearest PCI Capable Receiving Hospital for Primary PCI.
  - Activate STEMI Alert at receiving facility and transmit 12 L ECG as able
  - Consider Air Transport

- **Transport time estimated to be ≥ 60 minutes**
  - Goal Door to Thrombolysis administration ≤ 30 min
  - Notify medical control and consider transport to the closest appropriate non-PCI capable referring hospital for possible thrombolytic therapy and subsequent urgent transfer to a PCI Capable Receiving Facility for reperfusion.
  - Initiate thrombolytic contraindication checklist per protocol
  - Activate STEMI Alert at receiving facility and transmit 12 L ECG as able for provider confirmation
  - Consider Air Transport

**Diversion Criteria**

If patient demonstrates instability and/or has any one of the following criteria that may require ED evaluation and treatment by a practitioner proceed to **nearest appropriate hospital:**

- Symptoms suggestive of acute stroke or neurological evaluation
- Respiratory or Circulatory Instability
- Chest trauma or MVC victims
- DNR Status
- Consider Left Bundle Branch Block

(version revised 4/2015)
**BLS & ALS**

- Administer Oxygen to maintain SpO2 90% - 94% titrate as needed starting at 2 LPM per nasal cannula
- Obtain Systolic/Diastolic blood pressure (BP) in both arms
- Administer Chewable Aspirin 81 mg x 4 by mouth
- Evaluate if Erectile Dysfunction or Pulmonary hypertension medications taken in the past 24 hours including: Sildenafil (Viagra, Revatio), Vardenafil (Levitra, Staxyn), or Avanafil (Stendra), Tadalafil (Cialis, Adcirca). Hold nitrates for 48 hours following the last dose
- Administer Nitroglycerin Sublingual 0.4 mg every 5 minutes up to 3 doses if chest discomfort present and SBP > 100. Check BP prior to each administering dose. Hold if SBP ≤ 90.
- BLS only: Request ALS Intercept per local protocol (if transport time exceeds 15 min)
- Establish large bore IV Access (L) upper extremity preferred. Establish a 2nd IV line as time allows.

**ALS**

- If available consider:
  - Ticagrelor (Brilinta) 180 mg by mouth if transferring for PPCI with confirmation by PCI Receiving Facility and local medical control per protocol *** Do Not Administer Both Clopidogrel and Ticagrelor
  - OR
  - If Ticagrelor not available, then give Clopidogrel 600 mg by mouth if transferring for PPCI with confirmation by PCI Receiving Facility and local medical control per protocol
- Heparin IV Bolus 60 Units/kg, max 4,000 Units (No IV Heparin Drip) if transferring for PPCI after confirmation by PCI Receiving Facility and local medical control per protocol
- Establish a Nitroglycerine IV Drip if chest discomfort is unrelieved. Initiate @ 5 mcg/min & titrate in increments of 5mcg/min every 5 minutes for chest discomfort per protocol. Maintain a systolic BP of ≥90 mm/Hg or greater. Hold nitrates as indicated for criteria above.
- Administer Analgesia as needed per protocol

**Documentation Reminders:**

- ✓ Provide a printed copy of EMS Run Sheet, and 12 L ECG with Report to the receiving hospital ED staff
- ✓ Document Date and Time of:
  - EMS dispatch, First Medical Patient Contact, Scene departure, STEMI alert requested
- ✓ Document EMS agency number, and EMS run number

**AHA Mission: Lifeline EMS Best Practice Goals**

1. All patients with non-traumatic chest discomfort, ≥ 35 yrs. of age, treated and transported by EMS receive a pre-hospital 12-lead electrocardiogram
2. All STEMI patients transported directly to a STEMI receiving center, receive a first (pre-hospital) medical contact to PCI time ≤ 90 minutes directly or ≤120 minutes for Interfacility hospital transfers
3. All thrombolytic eligible STEMI patients treated and transported to a referring hospital for fibrinolytic therapy receive a door to needle time ≤ 30 minutes

**AHA Mission: Lifeline EMS Recognition Achievement Measures:**

1. Percentage of patients with non-traumatic chest pain ≥ 35 years, treated and transported by EMS who receive a pre-hospital 12-lead electrocardiogram
2. Percentage of STEMI patients treated and transported directly to a STEMI receiving center, with pre-hospital first medical contact to device time ≤ 90 minutes
3. Percentage of lytic eligible STEMI patients treated and transported to a STEMI referring hospital for thrombolytic therapy with a door to administration time ≤ 30 minutes

(version reviewed 4-2015)
Patient meets any of the following criteria
- HEART Score of 7-10
- ST depression or dynamic T-wave inversion strongly suspicious for ischemia
- Otherwise identified Non-ST elevation acute coronary syndrome (Non-STEMI)

Next step
- Admit to CCU or appropriate unit with cardiac telemetry (may require transfer)
  - Consider Cardiology consult

Medications
- Start adjunctive treatments (as indicated/if no contraindications):
  - Aspirin 324 mg PO (give suppository if unable to take PO)
  - Ticagrelor 180 mg PO or Clopidogrel 600 mg PO (loading doses)
    - (Prasugrel 60 mg PO could also be considered, but note warnings*)
  - Heparin 60 Units/kg (max 4,000 Units) IV bolus
  - Heparin 12 Units/kg/hr (max 1,000 Units/hr) IV infusion
- Other medications as indicated per institutional AMI order set

Assess Criteria for Early Invasive Strategy (Cath Lab)
- High-risk features & patient a candidate for invasive angiography (PCI)?
- Persistent or recurrent symptoms?
- New ST-segment depression and positive serum Troponin(s)?
- Depressed LV functional study that suggests multi-vessel CAD?
- Hemodynamic instability or VT?

Choose Treatment Strategy

Early Invasive Strategy (Cath Lab)
- Prepare for Cath Lab
  - Transfer if necessary by ground ambulance
    (Air transfers should be reserved for STEMI)
  - Insert 2 large bore peripheral saline lock IV’s in left arm
  - Continue adjunctive treatments as above
  - Consult Cardiology for additional treatments
    - (i.e. Beta-Blocker, Nitro, Morphine, O2, etc.)
- If CABG surgery is required
  - Continue Aspirin
  - Consult CT surgeon about stopping other therapies and timing (i.e. when to hold antplatelet)

P2Y12 Inhibitor Maintenance Dosing & Considerations
- Ticagrelor 90 mg PO twice daily or
- Clopidogrel 75 mg once daily or
- Prasugrel* 10 mg PO once daily (5 mg if ≤ 60 kg)
- Continue up to 12 months if medically treated
- Continue at least 12 months if treated with drug eluting stent, or per Cardiologist discretion
- If switching to a different P2Y12 inhibitor, consider a full loading dose at the time the next dose would be due

*Prasugrel/Warnings:
Do NOT use if history of stroke or TIA
Avoid in patients ≥ 75 yo or < 60 kg
Do NOT start if patient likely to undergo urgent CABG

Ischemia-Guided Strategy (Medical Therapy)
- Continue adjunctive treatments as indicated
- Continue serum Troponins q 3 hours x 3
- Continue serial ECG’s
  - Repeat PRN for recurring/worsening symptoms
- Obtain cardiac imaging study
  - Consult Cardiology for appropriate test
    - (i.e. Echocardiography, CTA, Radionuclide, etc.)

If therapy not effective, or pending results of imaging study, reconsider if Invasive Strategy (Cath Lab) would be appropriate.

Late Hospital/Posthospital Care
- Aspirin 81 mg PO once daily
- ACE inhibitor or ARB
- Beta-Blocker
- High Intensity Statin
- P2Y12 inhibitor per Cardiology
- Cardiac Rehab Referral

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Patient meets any of the following criteria

- HEART Score of 7-10
- ST depression or dynamic T-wave inversion strongly suspicious for ischemia
- Otherwise identified Non-ST elevation acute coronary syndrome

- Admit to CCU or appropriate unit with cardiac telemetry (may require transfer)
- Consider Cardiology consult
- Start adjunctive treatments (as indicated/if no contraindications):
  - Aspirin 324 mg PO (give suppository if unable to take PO)
  - Ticagrelor 180 mg PO or Clopidogrel 600 mg PO (loading doses)
    - (Prasugrel 60 mg PO could also be considered, but note contraindications)
  - Heparin 60 Units/kg (max 4,000 Units) IV bolus
  - Heparin 12 Units/kg/hr (max 1,000 Units/hr) IV infusion
  - Other medications as indicated per institutional AMI order set

Assess Criteria for Early Invasive Strategy (Cath Lab)

- High-risk features and patient a candidate for invasive angiography (PCI)?
- Persistent or recurrent symptoms?
- New ST-segment depression and positive serum Troponin(s)?
- Depressed LV functional study that suggests multi-vessel CAD?
- Hemodynamic instability or VT?

Early Invasive Strategy (Cath Lab)

- Prepare for Cath Lab
  - Transfer if necessary by ground ambulance
    - (Air transfers should be reserved for STEMI)
  - Insert 2 large bore peripheral saline lock IV's in left arm
  - Continue adjunctive treatments as above
  - Consult Cardiology for additional treatments
    - (i.e. Beta-Blocker, Nitro, Morphine, O2, etc.)

Choose Treatment Strategy

- Is CABG Appropriate?
  - Yes
    - CABG Surgery
      - Continue Aspirin therapy
      - Consult CT Surgeon about stopping other therapies and timing
        - (i.e. when to hold antiplatelet)
  - No
    - Urgent Angiography
      - For Intended PCI

Ischemia-Guided Strategy (Medical Therapy)

- Continue adjunctive treatments as indicated
- Continue serum Troponins q 3 hours x 3
- Continue serial ECG's
  - Repeat PRN for recurring or worsening symptoms
- Obtain cardiac imaging study
  - Consult Cardiology for appropriate test
  - (i.e. Echocardiography, CTA, Radionuclide, etc.)

Therapy Effective?

Late Hospital/Posthospital Care

- Aspirin 81 mg PO once daily
- ACE inhibitor or ARB
- Beta-Blocker
- High Intensity Statin
- P2Y12 inhibitor per Cardiology
  - Up to 12 months if medically treated
  - At least 12 months if treated with drug eluting stent (DES)
    - Ticagrelor 90 mg PO twice daily or
    - Clopidogrel 75 mg once daily or
    - Prasugrel 10 mg PO once daily (5 mg if ≤ 60 kg)
  - If switching to a different P2Y12 inhibitor, consider a full loading dose at the time the next dose would be due
    - Don’t Forget Cardiac Rehab Referral !!!
Minneapolis ED Chest Pain Protocol
... for Patients Presenting to an Emergency Department
with Chest Pain or Equivalent Symptoms of a Potential Acute Coronary Syndrome (ACS)

Obtain STAT 12-Lead ECG and IV blood draw for Serum Troponin level
- If ECG or Troponin is positive for ACS, patient is no longer low risk, follow appropriate ACS protocols
- Repeat 12-Lead ECG immediately if symptoms change
Once the first Troponin is resulted, calculate the HEART Score*

If the Heart Score is 0-3, patient is considered Low Risk:
- Use the Low Risk Shared Decision-Making Tool**
  - Inform patient at this point, there is a 1.7% risk of an adverse cardiac event in the next 4-6 weeks
  - Advise patient to stay for another Troponin and ECG at hour 2 of ED admission
If second Troponin and ECG are negative:
  - Inform the patient that now there is a 0.6% risk of an adverse cardiac event in the next 4 weeks
  - Advise that patient can be ruled out for ACS without a stress test
  - Advise patient to follow up with a provider within 1 week, or per local standard of care

If the Heart Score is 4-6, patient is considered Moderate Risk:
- Use the Moderate Risk Shared Decision-Making Tool**
  - Inform patient at this point there is a 13% risk of an adverse cardiac event in the next 4-6 weeks
  - Advise patient to be admitted for observation
  - Obtain serial ECG's and Troponins at hours 3 and 6
  - Evaluate need for admission or a provocative cardiac Stress Test within the next 72 hours
  - Follow appropriate ACS protocols, depending on findings

If the Heart Score is 7-10, patient is considered High Risk:
- Use the High Risk Shared Decision-Making Tool**
  - Inform patient at this point there is at least a 50% risk of an adverse cardiac event in the next 4-6 weeks
  - Advise patient to be admitted to PCI capable hospital and follow appropriate ACS protocols
  - Obtain serial ECG's and Troponins at hours 3 and 6
  - Post Cardiology for consultation

<table>
<thead>
<tr>
<th>HEART Category</th>
<th>Patient Score</th>
</tr>
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<tbody>
<tr>
<td>History</td>
<td>2 Points: Highly Suspectous (mostly high-risk features)</td>
</tr>
<tr>
<td></td>
<td>1 Point: Moderately Suspectous (mixture of high-risk and low-risk features)</td>
</tr>
<tr>
<td></td>
<td>9 Points: Slightly Suspectous (mostly low-risk features)</td>
</tr>
<tr>
<td></td>
<td>1 Point: Low-risk features</td>
</tr>
<tr>
<td></td>
<td>0 Points: None of the above</td>
</tr>
<tr>
<td>ECG</td>
<td>2 Points: New ischemic changes</td>
</tr>
<tr>
<td></td>
<td>1 Point: ST-segment depression (≥ 1 mm)</td>
</tr>
<tr>
<td></td>
<td>0 Points: Complete normalization</td>
</tr>
<tr>
<td>Age</td>
<td>2 Points: ≥ 65 yrs</td>
</tr>
<tr>
<td></td>
<td>1 Point: 45-64 yrs</td>
</tr>
<tr>
<td></td>
<td>9 Points: &lt; 45 yrs</td>
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<tr>
<td>Risk Factors</td>
<td>2 Points: 3 or more risk factors above or any one of the following:</td>
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<tr>
<td></td>
<td>1 Point: 1 or 2 risk factors</td>
</tr>
<tr>
<td></td>
<td>0 Points: No risk factors</td>
</tr>
<tr>
<td>Troponin</td>
<td>2 Points: &lt;1x Normal Limit</td>
</tr>
<tr>
<td></td>
<td>1 Point: &gt;1x &lt;3x Normal Limit</td>
</tr>
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<td>0 Points: &gt;3x Normal Limit</td>
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<tr>
<td>Total score</td>
<td>9-3: Low risk</td>
</tr>
<tr>
<td></td>
<td>4-6: Moderate risk</td>
</tr>
<tr>
<td></td>
<td>7-10: High risk</td>
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</tbody>
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Notes:
- If EPIC available, can use Dot-Phrase: *heartscore*
- **If EPIC available, can link to Chest Pain Shared Decision-Making Tools**

Final Draft - June 12th, 2018
Patient with Chest Pain or Potential ACS
Triaged in ED

Stat 12-Lead ECG & IV Troponin Drawn

Is ECG (+) for STEMI?

No

Wait for 1st Troponin Result

Repeat ECG Immediately if Symptoms Change

Calculate HEART Score After 1st Troponin Result

Is HEART Score 0 - 3 & Initial Troponin Negative?

Yes

Use Low Risk Shared Decision Making Tool:
Inform Patient That at This Point There Is Less Than 2% Chance (1.7%) of Adverse Cardiac Event in the next 4-6 weeks

No

Is ECG (+) for STEMI?

Yes

Activate STEMI Alert & Follow STEMI Process

No

Follow Process for Intermediate/High Risk NSTE-ACS (Hospitalize)

Is ECG (+) for STEMI?

Yes

Follow Process for Intermediate/High Risk NSTE-ACS (Hospitalize)

No

Is HEART Score 4 – 6 & Initial Troponin Negative?

Yes

Consider Admission Under Observation vs. Inpatient Status (In Hospital or Observation Unit)

Serial ECG’s & Troponin’s all Negative

Yes

Evaluate need for continued admission, or Stress Test within 72 hours

No

Final Draft 6/12/18

No

No

Is HEART Score 4 – 6 & Initial Troponin is Positive

Yes

Optional Use of High Risk Shared Decision Making Tool:
Inform Patient That at This Point There May Be More Than a 50% Chance of Adverse Cardiac Event in the next 4-6 weeks

No

Optional Use of Moderate Risk Shared Decision Making Tool:
Inform Patient That at This Point There May Be More Than a 13% Chance of Adverse Cardiac Event in the next 4-6 weeks

Does Patient Want a 2nd ECG & Troponin at Hour 2-3 of ED Stay?

Yes

Refer to Low Risk Shared Decision Making Document:
Inform Patient There is Now Less Than 1% Chance Of Adverse Cardiac Event in the next 4 weeks

No

No

Discharge to Home & Follow Up With Provider Within 1 Week (No Stress Test)

Yes

No

Does Patient Want a 3rd ECG & Troponin at Hour 6 of ED or Hospital Stay?

Yes

Consider Admission Under Observation vs. Inpatient Status (In Hospital or Observation Unit)

Serial ECG’s & Troponin’s all Negative

No

Follow Process for Intermediate/High Risk NSTE-ACS (Hospitalize)

No

Optional Use of High Risk Shared Decision Making Tool:
Inform Patient That at This Point There May Be More Than a 50% Chance of Adverse Cardiac Event in the next 4-6 weeks

Optional Use of Moderate Risk Shared Decision Making Tool:
Inform Patient That at This Point There May Be More Than a 13% Chance of Adverse Cardiac Event in the next 4-6 weeks
What To Expect Next?

1 Your Chest Pain Diagnosis
Initial testing has NOT shown any evidence of a heart attack. This is based on a blood test, an electrocardiogram (ECG), your exam, and your risk factors. It is recommended that a repeat blood test (Troponin), and electrocardiogram (ECG) both be performed approximately 2 to 3 hours after initial tests to further rule out a heart attack. However, even if everything today is normal, your chest pain may still be an early warning sign of a possible future heart attack or heart complication.

2 Further Evaluation
Further evaluation and testing will help check if your heart is working correctly. Understanding your risk of having a heart attack or heart complication can help decide how to best proceed with your care in the Emergency Department.

3 Your Personal Risk Evaluation
If a second Troponin blood test and ECG are both negative, your risk of having a heart attack or heart complication within the next 30 days can be determined by comparing you to people with similar factors who also came to an Emergency Department with chest pain.

4 The Next Step
Another ECG and Troponin blood test should be repeated 2 to 3 hours after your initial blood test, and if they are also negative, your Emergency Department Provider and you may both decide that you could be discharged to home, and recommend you follow up with a primary care provider or cardiologist. If you refuse, and go home before a second set of tests, your risk for a heart attack may be doubled, up to 2 out of every 100 patients.

For Chest Pain patients whom:
Initial ECG and Troponin are negative, and
HEART Score is Low Risk

Of every 100 people with factors like yours who came to the Emergency Department with chest pain, and had 2 negative ECG and Troponin tests...

...within 30 days of their Emergency Department visit:

Only 1 had a heart attack or a heart complication.
While 99 did not.

*Factors used to determine your risk:
History
ECG
Age
Risk Factors for Heart Disease
Troponin

Notes:

This shared decision tool was intended to help you understand your Personal Risk Evaluation. Even though you might be going home, you need to understand the importance of following up with your primary provider, or a cardiologist within 1 week.

If your chest pain or heart related symptoms return or worsen, you should call 911 or return to the Emergency Department immediately.
What To Expect Next?

1 Your Chest Pain Diagnosis

Initial testing has NOT shown any evidence of a heart attack. This is based on a blood test, an electrocardiogram (ECG), your exam, and your risk factors.*

It is recommended that a repeat blood test (Troponin), and electrocardiogram (ECG) both be performed approximately 2 to 3 hours after initial tests to further rule out a heart attack, and possibly again 3 hours later. However, even if everything today is normal, your chest pain may still be an early warning sign of a possible future heart attack or heart complication.

2 Further Evaluation

Further evaluation and testing will help check if your heart is working correctly. Understanding your risk of having a heart attack or heart complication can help decide how to best proceed with your care in the Emergency Department.

3 Your Personal Risk Evaluation

If your second Troponin blood test and ECG are both negative, your risk of having a heart attack or heart complication within the next 30 days can be determined by comparing you to people with similar factors* who also came to an Emergency Department with chest pain.

4 The Next Step

You have a moderate (intermediate) risk of a heart attack or complication in the near future. Your Emergency Department Provider may want you to agree to stay for observation and further testing. If you decline repeated tests and go home now, your current risk for a heart attack may be even greater than 13 out of 100 patients.

For Chest Pain patients whom:

Initial ECG and Troponin are negative, and

HEART Score* is Moderate Risk

Of every 100 people with factors* like yours who came to the Emergency Department with chest pain, and had 2 negative ECG and Troponin tests...

...within 30 days of their Emergency Department visit

13 had a heart attack or a heart complication.
While 87 did not.

*Factors used to determine your risk

History
ECG
Age
Risk Factors for Heart Disease
Troponin

Notes:

This shared decision tool was intended to help you understand your Personal Risk Evaluation. Further observation and testing may be necessary during this visit to the Emergency Department. If you do end up going home, you may still need further testing as an outpatient.

You need to understand the importance of following up with your primary provider, or a cardiologist, hopefully within 1 week, or whatever is recommended by your Emergency Department Provider.

If you do end up going home, and your chest pain or heart related symptoms return or worsen, you should call 911 or return to the Emergency Department immediately.
For Chest Pain patients whom:
Initial ECG and Troponin are negative, and
HEART Score* is High Risk

Of every 100 people with factors* like yours who came to the Emergency Department with chest pain, and had 2 negative ECG and Troponin tests...within 30 days of their Emergency Department visit:

- 50 had a heart attack or a heart complication.
- While 50 did not.

*Factors used to determine your risk:
- History
- ECG
- Age
- Risk Factors for Heart Disease
- Troponin

Notes:

This shared decision tool was intended to help you understand your Personal Risk Evaluation. Further observation and testing may be necessary during this visit to the Emergency Department. If you do end up going home, you may still need further testing as an outpatient. You need to understand the importance of following up with your primary provider, or a cardiologist, hopefully within 1 week, or whatever is recommended by your Emergency Department Provider.

If you do end up going home, and your chest pain or heart related symptoms return or worsen, you should call 911 or return to the Emergency Department immediately.
Who Needs A Stat 12-Lead ECG?

- **Age ≥ 18**
  - Cardiac Chest Pain
  - Clinical Judgement* Suggests Need for ECG
  - Yes → 12 Lead ECG Needed STAT!
  - No → Age ≥ 30

- **Age ≥ 30**
  - Any Chest Pain
  - Yes → 12 Lead ECG Needed STAT!
  - No → Age ≥ 50

- **Age ≥ 50**
  - Shortness of Breath
  - Weakness
  - Altered Mental Status
  - Syncope
  - Upper Extremity Pain - Nose to Navel (Arm, Back, Jaw, Neck, etc.)
  - Yes → 12 Lead ECG Needed STAT!
  - No → Age ≥ 80

- **Age ≥ 80**
  - Abdominal Pain
  - Nausea/Vomiting
  - Yes → 12 Lead ECG Needed STAT!
  - No → 12-Lead ECG Not Needed STAT
  - Continue to monitor and assess patient for any changes that would trigger the need for an ECG!!

*Clinical judgment requires assessment beyond the chief complaint. This list of rules is simply a guide. Clinical history, and evaluation of multiple symptoms beyond chest pain, may be present that should trigger concern for potential Acute Coronary Syndrome. Some of these include things like: Pressure, Discomfort, Tightness, Radiating Pain, Pounding, Racing, Breathing Fast, Sweating, etc. Be suspicious of patients with cardiac risk factors, like high blood pressure, high cholesterol, diabetes, smoking history, and patients with a known cardiac history or with recent cardiac surgery or intervention.

*Based on over 3.5 million ED visits