Cardiovascular:
Chest Pain/Discomfort

Goals: Prompt evaluation, triage, treatment and appropriate transport of patients with ischemic chest pain (Acute Coronary Syndrome – ACS) in order to minimize myocardial damage and preserve myocardial function
Inclusion Criteria: Patients with pain or discomfort in the chest or other body areas (jaw, neck, arm, or epigastrium) of suspected cardiac origin; and/or shortness of breath, sweating, nausea, vomiting, dizziness, syncope, shock or acute congestive heart failure of suspected cardiac origin
Exclusion Criteria: Chest pain due to blunt trauma
Refer to: Bradycardia, Pain, Shock, Tachycardia-Stable and Tachycardia-Unstable CPGs; Right-Sided and Posterior ECG Procedure and Transcutaneous Pacing Procedure; Destination Policy

NOTES:
- **Acute Coronary Syndrome (ACS) includes: ST-Elevation Myocardial Infarction (STEMI), non-ST-Elevation Myocardial Infarction (n-STEMI) and unstable angina.**
- **Ischemic chest pain may present as an "anginal equivalent" (e.g. epigastric pain/pressure; shoulder, neck or jaw pain/pressure; indigestion; shortness of breath; sweating and pallor; or AMS).**
- **Such "atypical" presentations are especially common in elderly, female and diabetic persons.**
- **Chest pain in persons after stimulant drug ingestion/injection should be assumed to be ischemic.**
- **Contact BioTel for all care of pediatric patients less than 14 years of age under this CPG.**
- **Be prepared for CPR and prompt defibrillation for any patient with possible ischemic chest pain.**
- **Do NOT administer nitroglycerin to any patient who has taken Viagra® (sildenafil), or Levitra® (vardenafil) within the past 24 hours, or Cialis® (tadalafil) within the past 48 hours.**

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, as clinically indicated:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of **94 to 99%** (continuous monitoring)
        i. Do NOT administer supplemental oxygen unless room air SpO_2 is less than 94%
    c. C (Circulation): Initiate continuous ECG monitoring; treat shock according to the Shock CPG
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
    e. E (Exposure/Environmental): Initiate measures to prevent hyperthermia
2. Positioning:
    a. Minimize patient exertion
    b. Position the patient in a position of comfort or supine (if signs/symptoms of shock, if tolerated)
3. If confirmed or suspected history of diabetes, perform and document a POC Glucose analysis and treat hypoglycemia according to the Diabetic Emergencies CPG
4. Administer aspirin: **EITHER** 324 mg (4 "baby" aspirin) **OR** 325 mg (one adult, non-enteric coated aspirin) by mouth (chewed before swallowing), even if the patient reports having taken aspirin prior to EMS arrival
5. Obtain a complete medication history, especially: cardiac/BP, blood thinner, and erectile dysfunction meds
6. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

7. Initiate continuous $PetCO_2$ monitoring (if signs/symptoms of shock/hypoperfusion) and maintain continuous ECG and SpO_2 monitoring until patient care has been transferred to hospital staff:
    a. If possible, titrate FiO_2 to the minimum concentration necessary to maintain SpO_2 94-99%
8. Treat hemodynamically-significant dysrhythmias according to the relevant CPG
9. Obtain and transmit a 12-Lead ECG as soon as possible:
    a. **NOTE:** 3-Lead ECG monitoring is not a substitute for a 12-Lead ECG
    b. Initial 12-Lead ECG should be obtained BEFORE giving nitroglycerin (NTG)
    c. Treatment based on 12-Lead ECG interpretation is outlined in Section 12, below
10. Immediately initiate transport to an appropriate hospital E.D. with 24-hour cath lab capability

11. Establish IV/IO access at TKO rate or use a saline lock, but do not delay nitroglycerin administration:
    a. **EXCEPTION:** If the 12-Lead ECG suggests acute inferior-wall MI, vascular access must be established BEFORE administering the first nitroglycerin dose
12. Perform 12-Lead ECG interpretation to identify STEMI and in order to guide therapy:
    a. **INFERIOR** wall MI **(ST-elevation in leads II, III and aVF) AND**:
        i. **SBP less than 90 mmHg** (or at least 30 mmHg below patient's baseline):
            1. Do not administer nitroglycerin (NTG)
            2. Position patient supine, with legs elevated, if tolerated
            3. Administer 20 mL/kg NS IV/IO (1 L maximum)
            4. If SBP remains less than 90 mmHg and no pulmonary edema, repeat fluid bolus once
            5. Do not administer additional IV/IO fluid without BioTel authorization
            6. Contact BioTel for authorization for fentanyl or morphine analgesia
        ii. **SBP at least 90 mmHg AND Heart Rate between 50 and 110 bpm:**
            1. Obtain IV/IO access BEFORE nitroglycerin (NTG) administration
            2. Administer nitroglycerin 0.4 mg SL
            3. May repeat up to two more times, every 5 minutes (maximum total: 3 doses), as long as SBP remains at least 100 mmHg
            4. Observe for hypotension
            5. If Heart Rate is less than 50 or greater than 110 bpm, consult BioTel before giving NTG
            6. For pain unrelieved by three doses of nitroglycerin, consider opioid analgesia:
                A. Fentanyl: 1 mcg/kg IN or SLOW IVP/IO (maximum single dose: 100 mcg); repeat once after 15 minutes, if needed (maximum total cumulative dose: 200 mcg); **OR**
                B. Morphine: 2 to 4 mg SLOW IVP/IO; repeat once after 15 minutes, if needed, as long as SBP is at least 90 mmHg (alternative if fentanyl is unavailable)
    b. **OTHER STEMI/NSTEMI patterns AND:**
        i. **SBP at least 90 mmHg AND Heart Rate between 50 and 110 bpm:**
            1. Do not delay nitroglycerin (NTG) administration for IV/IO access attempts
            2. Administer nitroglycerin 0.4 mg SL
            3. May repeat up to two more times, every 5 minutes (maximum total: 3 doses), as long as SBP remains at least 100 mmHg
            4. Observe for hypotension
            5. If Heart Rate is less than 50 or greater than 110 bpm, consult BioTel before giving NTG
            6. For pain unrelieved by three doses of nitroglycerin, consider opioid analgesia:
                A. Fentanyl: 1 mcg/kg IN or SLOW IVP/IO (maximum single dose: 100 mcg); repeat once after 15 minutes, if needed (maximum total cumulative dose: 200 mcg); **OR**
                B. Morphine: 2 to 4 mg SLOW IVP/IO; repeat once after 15 minutes, if needed, as long as SBP is at least 90 mmHg (alternative if fentanyl is unavailable)
    c. **NORMAL or inconclusive 12-Lead ECG, or ST-elevation in V1, or ST-depression in V1-V3:**
        i. Obtain and transmit Right-Sided (V4R) ECG and Posterior ("15-Lead") ECG
        ii. **If NO evidence of RV infarction, AND SBP is at least 90 mmHg, AND Heart Rate is between 50 and 110 bpm:**
            1. Treat according to **Section 11.b.i**, above
        iii. **If Right-Sided ECG suggests RV infarction, OR SBP is less than 90 mmHg, OR Heart Rate is less than 50 or greater than 110 bpm**, treat according to **Section 11.a.i**, above.
13. **If SBP falls to less than 90 mmHg** or more than 30 mmHg below patient's baseline after nitroglycerin, fentanyl or morphine administration, treat according to **Section 11.a.i**, above
14. If chest pain is suspected to be stimulant-induced (e.g. cocaine, methamphetamine, PCP, or "bath salts"), follow the guidelines outlined above to exclude or treat STEMI/NSTEMI AND:
    a. Administer sedation and monitor for respiratory depression:
        i. Midazolam: 2.5 to 5 mg IV/IO/IN/IM; repeat every 5-10 minutes, if needed
            1. Do not exceed 10 mg maximum, total, cumulative dose; **OR**
        ii. Diazepam: 2.5 to 5 mg IV/IO/IN/IM; repeat every 5-10 minutes, if needed
            1. Do not exceed 10 mg maximum, total, cumulative dose
15. Monitor vital signs (incl. temp), ECG, SpO_2 and $PetCO_2$ en route to hospital with 24-hour cath lab capability
16. **BioTel and/or the receiving hospital E.D. MUST be contacted as soon as possible – no exceptions!**
17. For additional patient care considerations not covered under standing orders, contact BioTel