Good Fellowship Ambulance &
EMS Training Institute

Serving the Community for Over 65 Years

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5.3 Congestive Heart Failure - ALS 5002

Clinical Guidelines:

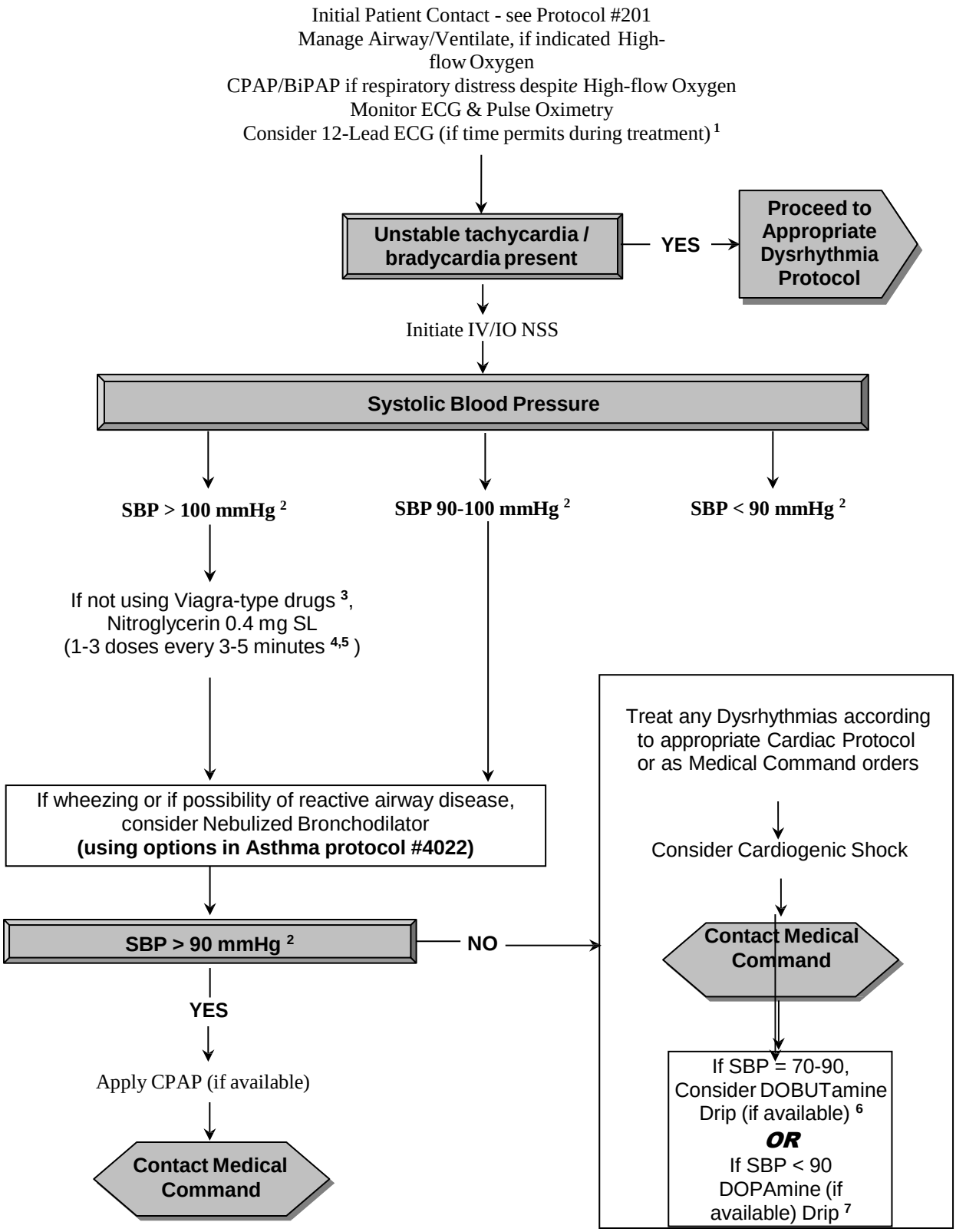
1. Patients with respiratory distress due to suspected acute congestive heart failure exacerbation should be administered an initial dose of 0.4mg (1 SL tablet) of Nitroglycerin by ALS providers (unless contraindicated).
2. After the initial dose of Nitroglycerin, a second full set of vitals should be obtained. Patients should then have IV Nitroglycerin administered if SBP is > 140 upon this reassessment.
3. Administer 200 mcg of push-dose IV Nitroglycerin.
    a. Obtain 50 mg vial of Nitroglycerin (50 mg/10mL – concentration 5 mg/mL)
    b. Obtain 100 mL bag of NSS
    c. Draw 2 mL (10 mg) of solution from the Nitroglycerin vial. (NOTE: Nitroglycerin 1 mL = 5 mg.)
    d. Mix 2 mL (10 mg) of Nitroglycerin with 100 mL NSS bag.
    e. Label 100 mL bag with "Nitroglycerin 10 mg/100 mL."
    f. Draw 2 mL (200mcg) of Nitroglycerin from 10 mg/100 mL bag. (For safety, a three (3) mL syringe will avoid significant overdose.)
    g. Administer 2 mL of 100mcg/mL Nitroglycerin.
        i. Nitroglycerin may be repeated every 3-5 minutes but avoid decreasing SBP below 100 or by more than 25% of initial SBP.
4. For patients that cannot be administered IV Nitroglycerin, sublingual Nitroglycerin should be given according to the patient's blood pressure (unless contraindicated).
    a. Systolic blood pressure between 100mmHg and 140mmHG receive 0.4mg (1 SL tablet)
    b. Systolic blood pressure between 140mmHg and 180mmHG receive 0.8mg (2 SL tablets)
    c. Systolic blood pressure greater than 180mmHg receive 1.2mg (3 SL tablets)
5. In the case the patient is unable to receive IV Nitroglycerin or SL Nitroglycerin patients should have 1- 2 inches of topical Nitroglycerin paste applied.
6. CPAP with a PEEP $\geq$ 10cm H2O should be utilized for patients with respiratory distress due to suspected acute CHF exacerbation.
    a. PEEP can be titrated down based on patient condition and reaction to therapy
7. All patients with suspected congestive heart failure exacerbation should have a 12-lead EKG performed.

Documentation Guidelines:

1. A complete set of vials signs should be obtained and documented before and after each administration of vasoactive medication.

2. Application of CPAP should be documented as an Activity Log line item with an "Airway-Other" add action. The add action should have "CPAP" listed as the action, and should include the level of PEEP administered.

CONGESTIVE HEART FAILURE
STATEWIDE ALS PROTOCOL



CONGESTIVE HEART FAILURE (CHF) STATEWIDE ALS PROTOCOL

Criteria:

A. Patients presenting with shortness of breath from pulmonary edema/CHF, as indicted by:

1. Severe dyspnea, tachypnea, bilateral rales, tachycardia, cough with frothy sputum, or orthopnea.
2. No fever
3. May be associated with restlessness, agitation, pedal edema, diaphoresis, or pallor.
4. Patient may have history of diuretic or digitalis use.

Exclusion Criteria:

A. Patients presenting with shortness of breath from non-CHF etiologies:

1. Pneumonia: **WARNING** - Patients with SOB from pneumonia may have symptoms similar to those of CHF, but these patients may be harmed by diuretics. Fever may be present in these patients.
2. COPD exacerbation: These patients may take bronchodilators without a history of diuretic use.
3. Pneumothorax: CPAP is contraindicated in these patients.

Possible MC Orders:

A. Additional Nitroglycerin

B. DOPAmine (if available) or DOBUTamine (if available) infusion

C. Captopril (if available) 25 mg sublingual or enalapril (if available) 0.625 – 1.25 mg IV

D. Endotracheal Intubation

Notes:

1. Ideally, transmit 12-lead ECG to medical command physician if possible. If STEMI, transport to emergency PPCI center may benefit patient – see Protocol #170.
2. Relative hypotension in pulmonary edema may indicate poor cardiac function. Aggressive use of diuretics and nitroglycerin may result in extreme hypotension and further reduction of cardiac output. Contact Medical Command to discuss individualizing treatment options in these patients.
3. **WARNING:** Nitroglycerin may lead to fatal hypotension if given to patients using drugs for erectile dysfunction.
   a. **DO NOT** give nitroglycerin (NTG) to a patient who has taken suldenafil (Viagra/Revatio) or vardenafil (Levitra) within 24 hours.
   b. **DO NOT** give NTG to a patient who has taken tadalafil (Cialis) within the last 48 hours.
   c. These medications may be used for conditions other than erectile dysfunction (e.g. Revatio is used for pulmonary hypertension).
4. After initial single tablet/spray of NTG, give nitroglycerin dose based upon blood pressure:
   a. If patient tolerates sublingual tablets or spray:
      i. 3 SL tablets or sprays – for SBP > 180
      ii. 2 SL tablets or sprays – for SBP 140-180
      iii. 1 SL tablet or spray – for SBP 100-140
   b. For patients who do not tolerate SL NTG (for example those on CPAP), may use one of the following:

i. [OPTIONAL] IV/IO nitroglycerine 200 mcg slow IV/IO, if available and approved by the agency medical director. Prepare as follows:

1. 25 mg/250 mL vial of NTG (concentration 100 mcg/mL)

- Draw 2 mL of solution from the vial. For safety, a three (3) mL syringe will avoid significant overdose and allow for slow administration. Agencies should consider packaging this smaller syringe together with the NTG vial.
- Administer 200 mcg (2 mL) of NTG IV/IO solution slowly over 2 minutes

2. 50 mg/10 mL vial of NTG (concentration 5000mcg/mL)

- Draw 2 mL of solution from the vial. For safety, a three (3) mL syringe will avoid significant overdose and allow for slow administration. Agencies should consider packaging this smaller syringe together with the NTG vial.
- Mix the 2mL into a 100 mL bag of normal saline solution. A label should be applied identifying the new solution as "10 mg/100 mL Nitroglycerin".
- Draw 2 mL from the bag of newly diluted NTG. For safety, a three (3) mL syringe will avoid significant overdose and allow for slow administration.
- Administer 200 mcg (2 mL) of NTG IV/IO solution slowly over 2 minutes

ii. [OPTIONAL] 1 – 2 inches of topical NTG paste.

c. When available and with an electronic IV pump, may substitute nitroglycerin IV infusion 5 – 200 mcg / min titrated to SBP>100.

5. NTG may be repeated every 3-5 minutes but avoid decreasing SBP below 100 or by more than 25% of initial SBP. [**Note:** One NTG repeated every 5 minutes is equivalent to a NTG infusion of 80 mcg/min]
6. Some recommendations suggest using DOBUTamine for mild cardiogenic shock (SBP 70-90) and DOPAmine for severe shock (SBP< 70). Mix DOBUTamine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally, start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP > 100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**
7. Mix DOPAmine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally, start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP > 100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**

Performance Parameters:

A. Outcomes follow-up to determine percentage of patients treated with this protocol that ultimately had hospital diagnoses of non-CHF conditions (e.g. pneumonia).

B. Blood pressure documented after each dose of vasoactive medication (e.g. nitroglycerin)