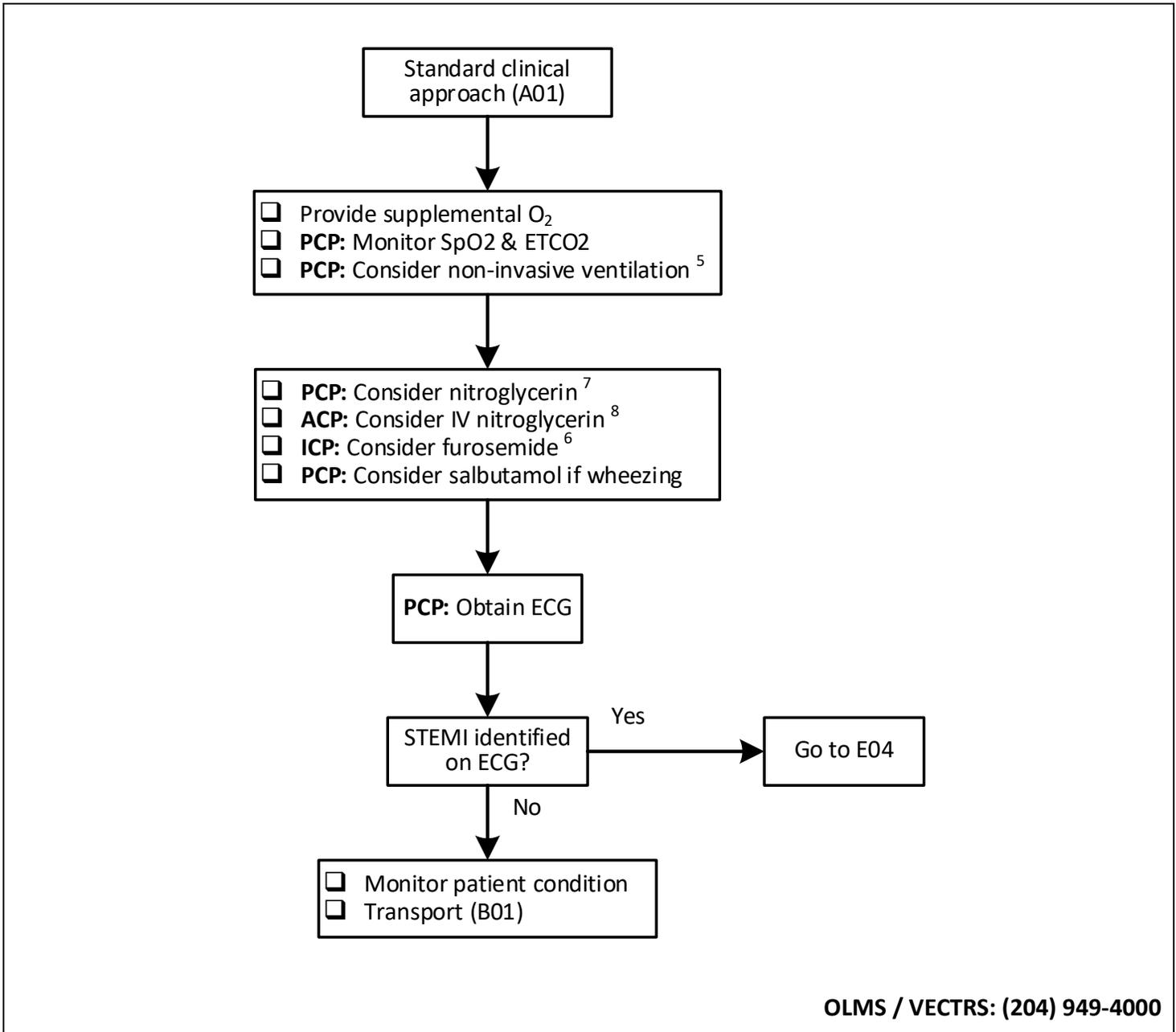


	E08 - HEART FAILURE & PULMONARY EDEMA (ADULT)		
	Version: 2025-03-19	Effective: 2025-04-30 (07:00)	
PCP = PCP = ACP	ICP = ICP & ACP	ACP = ACP only	None = EMR - PCP



INDICATIONS

- Patients with acute dyspnea, worsening of chronic dyspnea, respiratory distress, or respiratory failure due to heart failure or pulmonary edema

WARNINGS

- For cardiogenic shock refer to C07.3

NOTES

1. In the absence of arterial blood gas analysis, respiratory failure should be presumed with a pulse oximetry measurement of less than 90% on room air or a capnometry reading of greater than 45 mmHg. Patients with dyspnea or distress can *rapidly* progress to respiratory failure despite adequate initial readings. Continuous monitoring with oximetry, capnometry, electrocardiography and frequent blood pressure measurements is essential.

Agitation in a patient with respiratory distress is assumed to be due to hypoxemia until proven otherwise, while a decrease in level of consciousness may indicate progressing hypercapnia. **DO NOT SEDATE A PATIENT WITH RESPIRATORY DISTRESS OR FAILURE.**

2. **Acute decompensated heart failure (ADHF)** is a common cause of dyspnea and may be due to a variety of cardiac diseases. It may occur suddenly due to a new event (eg. ischemia, arrhythmia) or may represent a more gradual deterioration of the chronically failing heart (eg. disease progression, noncompliance). While commonly called congestive heart failure, it may or may not be accompanied by signs of congestion (i.e. fluid overload).

Acute cardiogenic pulmonary edema (ACPE) refers to heart failure causing fluid overload in the lungs (ie, respiratory distress, crackles, distended neck veins) and is often called *cardiogenic* pulmonary edema to differentiate it from noncardiac causes of increased lung fluid. In addition to crackles, wheezing due to edema in the bronchiolar walls may be present and work of breathing may improve with bronchodilator administration.

3. Non-invasive ventilation (NIV) with continuous positive airway pressure (CPAP) or bilevel positive airway pressure (BPAP) is a proven effective treatment for respiratory failure from acute cardiogenic pulmonary edema. It is an aerosol generating medical procedures (AGMP) and appropriate personnel protective equipment (PPE) is required (A09).
4. Vasodilators are effective for improving elevated filling pressures and reducing left ventricular (LV) afterload. They are particularly useful with severe hypertension and acute valvular insufficiency. They should be used with extreme caution in right ventricular ischemic dysfunction (RVID) and aortic stenosis. Hypotension must be assiduously avoided in acute myocardial infarction. They too are contraindicated in cardiogenic shock.

At lower doses, nitroglycerin produces more venous than arterial vasodilation which lowers LV filling pressure. At higher doses, it reduces systemic vascular resistance (SVR) which improves LV afterload. Where possible, the IV route is preferred due to its more rapid onset and ease of titration.
5. While IV nitroglycerin is most commonly administered by continuous infusion, in extremely time critical situations bolus nitroglycerin has been shown to be safe and effective.

6. Diuretics are effective for relieving volume overload in heart failure and pulmonary edema , and early administration is associated with reduced mortality. In acute mitral or aortic regurgitation or hypertensive emergency, pulmonary edema may be present without significant volume overload and intravenous (IV) furosemide is effective for improving oxygenation. Although the peak effect may take up to two hours, the onset of diuresis typically begins within 15 to 20 minutes.

Diuretics are contraindicated in cardiogenic shock.

7. Acute coronary syndrome (ACS) with myocardial ischemia or infarction may present as heart failure with minimal or no cardiac pain.

LINKS

- A01 - Standard Clinical approach
- A09 - Aerosol Generating Medical Procedures
- B01 - Standard Destination & Redirection
- C07.3 - Cardiogenic Shock
- E04 - ACS & STEMI & NSTEMI-ACS
- M09 - Furosemide
- M21 - Nitroglycerin

APPROVED BY



EMS Medical Director



EMS Associate Medical Director

VERSION CHANGES (REFER TO X05 FOR CHANGE TRACKING)

- Retitled
- Addition of ACP work scope & IV nitroglycerin