



Common presenting features of acute heart failure are anxiety, breathlessness and tachycardia. Examination will reveal a raised respiratory rate, respiratory distress (use of accessory muscles and sub-costal recession), and auscultation of the chest will reveal widespread crepitations.

The commonest cause likely to be encountered by HEMS crews is an acute cardiac syndrome, namely STEMI or NSTEMI, or an acute dysrhythmia, including uncontrolled atrial fibrillation, ventricular tachycardia and complete heart block.

For acute respiratory distress associated with trauma refer to the chest injury SOP.

Severe cases will be complicated by cardiogenic shock with a systolic BP < 80mmHg.

Management of acute heart failure is both general, aimed at improving oxygen delivery to the tissues and relieving the distressing symptoms the patient will be experiencing and specific to the underlying cause of the failure.

### General Measures

1. Reassure the patient
2. Sit the patient upright and transfer in this position
3. Administer high flow **oxygen** via non-rebreathing mask
4. Assess the patient fully, including taking a 12-lead ECG
5. Titrate **morphine** 10mg/10ml to effect, even if there is no pain. (End point is relief of distress). Morphine acts as a peripheral dilator, reducing cardiac preload as well as effectively managing the symptoms of drowning that are associated with acute LVF.
6. Administer **furosemide** 50mg IV for acute pulmonary oedema

7. There is growing evidence of the benefit of nitrates especially in the presence of chest pain for patients with pulmonary oedema. In addition to furosemide, administer 2mg **buccal GTN** tablet if systolic BP > 100mm Hg
8. Consider use of **CPAP** during transfer. CPAP valves are carried in the breathing drawer in the aircraft and require a high flow (>15L/min) of oxygen for use.
9. Closely monitor the patient during transfer and prepare for possibility of cardiac or respiratory arrest.

### Specific Measures

1. If arrhythmia is identified, manage as per ALS guidelines as far as able in the pre-hospital environment. GNNAS does not currently carry facilities for external pacing and sedation for elective defibrillation is hazardous. The patient should be stabilised as well as possible and then rapidly transferred to hospital.
2. If STEMI is identified, manage as per chest pain/STEMI SOP.

### Time Critical Features

1. Extreme breathing difficulty
2. Hypoxia despite supplementary oxygen ( $O_2 < 95\%$ )
3. Exhaustion
4. Decreased conscious level
5. Systolic BP <90mmHg
6. Tachycardia greater than systolic BP

The following features are indicative of a time-critical condition. Patients with these features should be evacuated rapidly to a unit with a catheter facility (JCUH and LGI in GNAAS area). Note that these patients fall outside of the STEMI protocol unless STEMI is identified during assessment. If JCUH or LGI is not the nearest hospital, each case should be discussed with the cardiology team on duty before lifting with the patient and a pre-alert sent if appropriate.