

# ACUTE HEART FAILURE

## (PULMONARY EDEMA)

HPI	Signs & Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> <li>Congestive heart failure</li> <li>Previous MI</li> <li>Medications: bumex, lasix</li> </ul>	<ul style="list-style-type: none"> <li>Shortness of breath</li> <li>Peripheral pitting edema</li> <li>Rales, ronchi</li> <li>Pink, frothy sputum</li> <li>Inability to speak complete sentences</li> <li>Jugular vein distension</li> <li>Chest pain</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Acute coronary syndrome</a></li> <li><a href="#">Asthma/COPD</a></li> <li>Pneumonia</li> <li>Aspiration/obstruction</li> </ul>

	EMR	EMT	PM
1. Provide <a href="#">Adult Routine Medical Care</a> - treat life threatening problems with airway, breathing circulation and disability	•	•	•
2. Obtain ECG and 12 lead, monitor Capnography		•	•

**UNSTABLE:** Altered Mental Status, MAP < 65 or SBP < 100

3. Treat dysrhythmias per protocol		•
4. See <a href="#">Cardiogenic Shock</a>		•

**UNSTABLE:** SBP > 160

3. <a href="#">NITROGLYCERIN</a> : 1.2 mg (3 tabs) SL initial dose 0.4 mg SL, repeat 5 min., no max.		•
4. CPAP: 5 cm PEEP, may increase, max. 10 cm PEEP	•	•

**STABLE:** GCS 15, MAP >65, SBP 100 - 160, skin warm/dry

3. CPAP: 5 cm PEEP, may increase, max. 10 cm PEEP	•	•
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**NOTE:**

- NITROGLYCERIN** should be withheld from patients who have taken erectile dysfunction or pulmonary hypertension medications in the last 48 hours such as Viagra, Levitra, Cialis.
- If during CPAP patient deteriorates, remove CPAP and consider advanced airway placement.

**PEARLS:**

- When assessing for cause of respiratory distress, CHF tends to be associated with lower levels of Capnography compared to COPD.
- NITROGLYCERIN** reduces left ventricular filling pressure primarily via venous dilation. At higher doses the drug variably lowers systemic afterload and increases stroke volume and cardiac output.

# ADULT DRUG ASSISTED INTUBATION

HPI	Signs & Symptoms	
<ul style="list-style-type: none"> <li>• Anaphylaxis</li> <li>• Asthma/COPD</li> <li>• CHF/Pulmonary edema</li> <li>• Trauma</li> <li>• Inhalation burns</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Failure to oxygenate /ventilate</li> <li>• Failure to maintain airway</li> <li>• Imminent loss of airway</li> <li>• Expected clinical course</li> <li>• Respiratory failure</li> </ul>	<ul style="list-style-type: none"> <li>• RR &lt; 10 or &gt; 40</li> <li>• Shallow/labored effort</li> <li>• SpO2 ≤ 92% on 100% O2</li> <li>• Airway edema</li> <li>• Soot in mouth/nares</li> <li>•</li> </ul>

## Considerations:

1. When less-invasive methods (two-person BVM with adjuncts) are ineffective or inappropriate, consider drug assisted endotracheal intubation to maintain oxygenation and/or ventilation.
2. Respiratory failure not responding to BLS interventions/treatment, consider drug assisted endotracheal intubation

	EMR	EMT	PM
1. Provide <a href="#">Adult Routine Medical</a> / <a href="#">Trauma Care</a> - treat life threatening problems with airway, breathing, circulation, and disability.	•	•	•
2. Obtain ECG, monitor Capnography (obtain 12 lead as able)		•	•
3. Pre-oxygenate 100% <b>OXYGEN</b> for 3 minutes, goal SpO2 100%	•	•	•
4. Assist ventilations 1 breath/6 sec. (10 breaths/min.)	•	•	•
5. Support blood pressure to achieve MAP > 65			•
6. Assess for positive gag reflex		•	•
7. <b>***Use ideal body weight chart below</b> <b>KETAMINE:</b> <u>Initial induction dose</u> , IVP/IO, slowly over 1 min, max single dose 300mg			•
8. After 1 minute, reassess gag reflex for therapeutic effects of Ketamine. If inadequate sedation <b>***Use ideal body weight chart below</b> <b>KETAMINE:</b> <u>Second induction dose</u> , IVP/IO, slowly over 1 min., max. total dose 450mg			•
9. Intubate. Verify placement with Capnography (continue to monitor throughout) <b>***if unable to intubate, consider alternative airway devices</b>			•
10. Secure tube. Place c-collar to maintain tube position			•
11. As needed, for post-intubation sedation: <b>***Use ideal body weight chart below</b> <b>KETAMINE:</b> <u>Post-intubation sedation dose</u> , IVP/IO, slowly over 1 min., may repeat 5 min., no max. dosage. Titrate to RASS -2 to -3			•

## PEARLS:

1. Patients with significant respiratory distress should have continuous pulse oximetry and waveform capnography monitoring for both assessment and for guiding therapy.
2. During respiratory failure, utilize BVM with patient's head elevated 30 degrees for optimal pre-oxygenation

- Optimize patient for first-pass success with pre-procedure preoxygenation, sniffing positioning, and sedatives and as indicated by patient presentation
- See [Drug Shortages](#) if Ketamine not stocked

**KETAMINE 500MG/10mL**

**IDEAL BODY WEIGHT**

<b>ADULT MALE:</b>			
Initial Induction Dose			
height	Kg	dose	vol.
< 5'6"	50 kg	100 mg	2 mL
5'6"-6"	63 kg	126 mg	2.5 mL
> 6'	75 kg	150 mg	3 mL

<b>ADULT FEMALE:</b>			
Initial Induction Dose			
height	Kg	dose	vol.
< 5'	45 kg	90 mg	1.8 mL
5'-5'6"	50 kg	100 mg	2 mL
> 5'6"	63 kg	126 mg	2.5 mL

Second Induction Dose			
height	Kg	dose	vol.
< 5'6"	50 kg	50 mg	1 mL
5'6"-6"	63 kg	63 mg	1.3 mL
> 6'	75 kg	75 mg	1.5 mL

Second Induction Dose			
height	Kg	dose	vol.
< 5'	45 kg	45 mg	0.9 mL
5'-5'6"	50 kg	50 mg	1 mL
> 5'6"	63 kg	63 mg	1.3 mL

Post-Intubation Sedation			
height	Kg	dose	vol.
< 5'6"	50 kg	25 mg	0.5 mL
5'6"-6"	63 kg	32 mg	0.6 mL
> 6'	75 kg	38 mg	0.8 mL

Post-Intubation Sedation			
height	Kg	dose	vol.
< 5'	45 kg	23 mg	0.5 mL
5'-5'6"	50 kg	25 mg	0.5 mL
> 5'6"	63 kg	32 mg	0.6 mL

Richmond Agitation Sedation Scale (RASS)		
4	Combative	Overtly combative, violent, immediate danger to staff
3	Very agitated	Pulls/removes tubes, aggressive
2	Agitated	Frequent non-purposeful movement
1	Restless	Anxious, non-aggressive/violent movement
0		Alert and calm
-1	Drowsy	Sustained awakening to voice (>10 sec)
-2	Light sedation	Briefly awakens with eye contact (< 10 sec)
-3	Moderate sedation	Movement/eye movement to voice, no eye contact
-4	Deep sedation	Movement/eye opening to physical stimulation
-5	Cannot be aroused	No response to voice/physical stimulation