CHF | Acute Pulmonary Edema

Medical History Indications

- Hx of CHF, MI, AFib, Renal Failure
- Use of diuretics
- New or increasing dyspnea on exertion (DOE)
- Increasing Pillow orthopnea
- Paroxysmal Nocturnal Dyspnea
- Prior Intubation

Physical Exam Indications

- Dyspnea
- Cough with sputum
- JVD at 30° elevation
- Lower extremity edema
- Rales / Rhonchi
- Tachycardia
- Hepatojugular Reflux[1]

Routine Medical Care

Early **CPAP** 5-10cm H_2O

Blood Pressure
and
12-Lead EKG
to assess for STEMI[2]

SBP ≥ 100mmHg and severe respiratory distress

[3] **SL Nitroglycerin** 0.4mg q5min prn for dyspnea
no max dose if SB ≥ 100mmHg
ALSO
NTG Paste 1 inch TD may be used to supplement NTG SL PRN SBP >100mmHG
*If symptoms persist and systolic BP >180mmHg
Consider **Nitroglycerin IV**
400mcg IV/IO every 2min,repeat as needed to improve respiratory status or until systolic BP is 140 systolic, then consider infusion, if IV pump is available.
Start **Nitrogylcerin Infusion** at 50 mcg/min, increase 5 mcg/min every 5 minutes as systolic allows.
Goal is to improve the respiratory status , but not drop systolic blood pressure below 140.

For Anxiolysis -A level of sedation in which a person is very relaxed and may be awake
Midazolam 2.5 mg IV/IO/IM

If failing above therapy:

- Discontinue CPAP and ventilate using BVM with PEEP valve
- Consider/prepare for advanced airway
- Consider potential CHF complications and alternative diagnoses (e.g. equipment failure, pneumothorax, shock)

Recycle and record BP q2-5min

NTG Contraindications

- SBP < 100mmHg
- Recent use of erectile dysfunction medication (Viagra/Levitra within 24 hours, Cialis within 48 hrs)

Suspected RV infarct[3] is a relative contraindication (monitor for hypotension)

[4]Consider **Push Dose Epinephrine** while preparing vasopressor infusion

Mix in syringe 1ml of 0.1mg/ml (1:10,000) Epinephrine with 9 ml of NS (syringe = 10mcg/ml of Epi)

Give 1ml IV/IO q3-5 min prn

Contact **Medical Control** for additional orders or consultation

SBP < 100mmHg and severe respiratory distress (RR30)

[4]Initiate Vasopressor Infusion:
Norepinephrine 2-12 mcg/min
or
Epinephrine 2-20 mcg/min
*titrate to MAP ≥ 65mmHg

- Discontinue CPAP if SBP < 90mmHg and patient is showing signs of deterioration (e.g. worsening dyspnea, sustained hypotension, declining mental status)

Prepare for advanced airway as outlined in **Airway Management (2 of 3)** protocol - **Can't Ventilate & Can Intubate**

Recycle and record BP q2-5min

[1] Hepatojugular reflux indicates right sided heart failure. With the patient sitting at a 30° angle, lightly palpate the abdomen over the liver. If the jugular veins rise ≈ 4cm = positive reflux.

[2] Consider myocardial infarction as a cause of pulmonary edema – transport to a facility with a cardiac catheterization lab if needed.

[3] Repeated doses of SL Nitroglycerin should be prioritized over topical nitroglycerin which takes at least 10 minutes to take effect. Diuretics have little value in treating acute pulmonary edema and are no longer considered first-line treatment.

[4] Consider an RV infarct in all inferior STEMIs (leads II, III, AvF) with hypotension. ST elevation in lead V4R (obtain a right sided EKG) helps to make this diagnosis. Hypotension and bradycardia are common.