Nursing care on pulmonary edema

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Definition:
Pulmonary edema is an accumulation of fluid in the alveoli and interstitial spaces of the lungs.
Types:

Cardiogenic pulmonary edema

Non cardiogenic pulmonary edema
<table>
<thead>
<tr>
<th><strong>Cardiogenic pulmonary edema</strong></th>
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<tbody>
<tr>
<td><strong>Causes</strong></td>
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<tr>
<td>Congestive heart failure</td>
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<tr>
<td>Severe arrhythmias</td>
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<tr>
<td>Hypertensive crisis</td>
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<tr>
<td>Fluid overload due to kidney failure</td>
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<td>or intravenous therapy</td>
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Cardiogenic pulmonary edema is either due to direct damage to cardiac tissue or a result of inadequate functioning of the heart or circulatory system.

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<th><strong>Non cardiogenic pulmonary edema</strong></th>
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<td><strong>Causes</strong></td>
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<tr>
<td>Inhalation of toxic gases</td>
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<tr>
<td>Aspiration e.g. Gastric fluid or incase drowning</td>
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<td>Multiple blood transfusions</td>
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<tr>
<td>Severe infection</td>
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Defined as the radiographic evidence of alveolar fluid accumulation without hemodynamic evidence to suggest cardiogenic etiology.
**Clinical Manifestations**

- Coughing and restlessness during sleep (premonitory symptoms).
- Sudden onset of dyspnea
- Severe anxiety, restlessness, irritability
- Cool, moist skin
- Tachycardia
- Orthopnea
- Distended Jugular veins
- Noisy, wet respirations that do not clear with coughing
  Cough with frothy, blood-tinged sputum.

**Diagnostic Evaluation**

* Clinical findings on assessment
* Oxymetry or ABG Values
* Chest X-ray (may reveal fluid in/around lung space or enlarged heart)
* Echocardiogram to detect valvular disease
* Measurement of pulmonary artery wedge pressure by swan-ganz catheter
* Blood culture in suspected infection
* Cardiac markers in suspected MI
Management

The immediate objective of treatment is to improve oxygenation and reduce pulmonary congestion.

Medical treatment for Pulmonary Edema is considered an emergency.

If possible, find and treat the underlying cause of Pulmonary Edema.

Identification and correction of precipitating factors and underlying conditions are then necessary to prevent recurrence.

Cont’d .Management

**Oxygen therapy** : high flow either by non rebreathe mask or ETT intubation and mechanical ventilation.

**High fowlers position** (HOB 90 degrees)

**Morphine** Reduces Anxiety and reduces resistance which the heart must pump.

**Diuretic therapy (Lasix)** reduces fluid overload and pulmonary congestion by producing diuresis.

**Vasodilator therapy (Nitroglycerin)**: Reduces the amount of blood returning to the heart and reduces resistance which the heart must pump.
Cont’d. Management

**Contractility enhancement therapy** (digoxin [Lanoxin], dopamine [Intropin], dobutamine [Dobutrex])

Improves the ability of the heart muscle to pump more effectively, allowing for complete emptying of blood from the ventricle and subsequent decrease in fluid backing up into the lungs.

**Aminophylline** may prevent bronchospasm associated with pulmonary congestion. Use with caution because it may also increase heart rate and induce tachydysrhythmias.

Complications

**Dysrrhythmias**

**Respiratory failure**
**NURSING ALERT**

Acute pulmonary edema is a true medical emergency; it is a *life-threatening* condition.

Act promptly to assess patient and notify health care provider of findings

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**Nursing Diagnosis**

- Impaired Gas Exchange related to excess fluid in the lungs
- Anxiety related to sensation of suffocation and fear
Initial Nursing Management ER

- Supplementary oxygen with face
- Elevate the head side or keep in sitting posture
- Monitor Vital Signs
- I/v line
- Catheterization
- Cardiac monitoring
- ECG
- Pulse oxymetry

NURSING INTERVENTION

- Help the patient relax to promote oxygenation
- Place the patient in high Fowler’s position to enhance lung expansion
- Administer oxygen as ordered
- Carefully record the time morphine is given and the amount administered
- Assess the patient’s condition frequently
- Be alert to development of a new nonproductive cough.
- Auscultate the lung fields for breath sounds and be alert for crackles (Rales)
- Watch for complications of treatment such as electrolyte depletion
- Monitor oxymetry and report the findings of <92% to the AP

- Monitor ABG results for presence of hypoxemia (decrease PaO2) and hypercapnia (increase PcO2)
- Assess for signs of hypoxia: restlessness, confusion, headache
- Monitor ECG for dysrrhythmia development that may be related to hypoxemia, acid-base imbalance, or ventricular irritability
- Kept ready the emergency equipments (Airway, Ambu bag, Intubation tray)
Closely monitor I/O chart

Record weight daily and report if steady gaining. Monitor vital signs every 15 to 30 minutes or more often as indicated

Provide frequent mouth care to reduce dryness of mucous membrane.

Keep environment calm and quiet.

Be alert for signs of increasing respiratory distress

Assess for edema especially in dependent areas such as the ankles and sacrum

Patient Education and Health Maintenance

Teach the patient about early symptoms before onset of acute pulmonary edema. If coughing develops (a wet cough), sit with legs dangling over side of bed

Teach the patient to take slow and deep breath to increase the oxygenation.

Teach the patient to take sodium restricted diet

Watch for gain weight
Outcome Criteria

- RR 12 to 20 breaths/min
- Eupnea
- Lungs clear to auscultation
- pH 7.35 to 7.45
- Pao2 80 to 100 mm Hg
- Paco2 35 to 45 mm Hg
- O2 sat > 95%
- Appears calm; rests comfortably

Thank you