postcardiac surgery is a multistep process that starts before surgery and continues during both the operative and postoperative phases. Different pulmonary protection strategies have evolved over the years; however, the wide acceptance and clinical application of such techniques remain hindered by the poor level of evidence or the sample size of the studies. A better understanding of available modalities and/or combinations can result in the development of customised strategies for the different cohorts of patients with the potential to hence maximise patients and institutes benefits.

Respiratory care in cardiac surgery involves proactive, team-based management-including physiotherapy, incentive spirometry, and early mobilization-to prevent pulmonary complications like atelectasis and pneumonia. Key interventions focus on clearing secretions, supporting lung expansion through deep breathing exercises, early extubation, and oxygen therapy.

Causes of Respiratory Dysfunction after Cardiac Surgery

* Decreased central respiratory drive
* General anesthesia, narcotics
* Neurologic injury
* Decreased respiratory muscle function
* Residual effect of muscle relaxants
* Pain, chest drainage tubes
* Poor cardiac function
* Severe obesity
* Diaphragm dysfunction (unilateral or bilateral)
* Exa('t'rbation of COPD
* Increased airway resistance
* Worsened bronchitis
* Alveolar diseases
* Pulmonary edema
* Cardiogenic
* Noncardiogenic
* Atelectasis
* Pneumonia

Preoperative Care

* Breathing Exercises: Patients are taught deep breathing, coughing techniques, and how to use an incentive spirometer to increase lung volume.
* Smoking Cessation: Encouraged to improve lung function and reduce mucus production.
* Education: Instruction on using

Postoperative Care (ICU and Ward)

* Mechanical Ventilation & Extubation: Early extubation (removing the breathing tube) is a priority to reduce risk of ventilator-associated pneumonia.
* Oxygen Therapy: Administered via nasal catheter or mask based on oxygen saturation levels.
* Hyperinflation Therapy: Use of incentive spirometry (10 deep breaths per hour) and positive end-expiratory pressure (PEEP) to keep airways open.
* Airway Clearance: Coughing exercises, often using a "huff" technique, supported by a pillow over the sternal incision.
* Physiotherapy: Early mobilization (getting out of bed) and chest physiotherapy to improve lung volume and prevent secretion buildup.
* Pain Management: Essential to enable effective coughing and deep breathing.

Common Complications and Mitigation

* Atelectasis: Collapse of lung tissue caused by shallow breathing is prevented by frequent incentive spirometry and movement.
* Pulmonary Embolism: Risk reduced by early mobilization to prevent blood clots.
* Fluid Management: Diuretic therapy is used to reduce fluid accumulation in the lungs.

Key Techniques

* Deep Breathing: Inhaling deeply, holding for 3 seconds, and exhaling slowly, repeated 5-10 times hourly.
* Incentive Spirometry: Using a device to encourage deep, sustained inhalation.
* Huff Coughing: A forced exhalation technique that helps move mucus without excessive strain

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