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Choice of Ventilator Strategy for Different Patients

Essay

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Haidy Waheeb Fahmi

CONTENT

List of figure

List of table

Abbrevation

A/C	assist/control mode ventilation
ALI	acute lung injury
APC	adaptive pressure control
APRV	Airway pressure-release ventilation
ARDS	acute respiratory distress syndrome
ARF	Acute Respiratory Failure
ASV	Adaptive support ventilation
ATC	automatic tube compensation
BIPAP	biphasic positive airway pressure
C	Compliance
CBV	cerebral blood volume
Ccw	compliances of chest wall
Cdyn	the dynamic compliance
Cl	compliances of lung
CMV	controlled mandatory ventilation
CPAP	Continuous Positive Airway Pressure
CPP	cerebral perfusion pressure
Crs	compliances of the respiratory system
EAdi	electrical activity of the diaphragm
ECMO	Extracorporeal membrane oxygenation
EPAP	expiratory positive airway pressure
FEFx	forced expiratory flow

FEV_1	Forced expiratory volume in one second
FiO_2	fraction of inspired oxygen
FVC	Forced vital capacity
GCS	Glasgow Score
HFOV	High-frequency oscillatory ventilation
ICP	intracranial pressure
IMV	intermittent mandatory ventilation
iNO	Inhaled nitric oxide
IPAP	inspiratory positive airway pressure
IRV	Inverse ratio ventilation
ITP	intra thoracic pressure
MAP	mean arterial pressure
MEFx	Maximum expiratory flow
MIP or PImax	The maximal inspiratory pressure
MOF	Multiple Organ Failure
NAVA	Neural adjusted ventilator assist
NIV	noninvasive ventilation
NMBAs	Neuromuscular blocking agents
NPPV	Noninvasive positive pressure ventilation
OLDs	obstructive lung diseases
$PaCO_2$	Arterial CO_2 tension
PaO_2	arterial oxygen tension
PAV	proportional assist ventilation

PC	Pressure control mode
PEA	pulseless electrical activity
PEEP	Positive End Expiratory Pressure
PEF	Peak expiratory flow
PEF	peak expiratory flow
PH	Pulmonary hypertension
PL-IRV	pressure-limited ventilation inverse ratio ventilation
PS	Pressure support
RICUs	Respiratory intermediate care units
RSBI	The rapid shallow breathing index
SBTs	Spontaneous breathing trials
SIMV	synchronized intermittent mandatory ventilation
SpO_2	oxyhemoglobin saturation
TNF	Tumor Necrosis Factor
TV	Tidal Volume
VAP	Ventilator Associated pneumonia
VC	Vital capacity
VL-IRV	volume-limited ventilation inverse ratio ventilation
WCs	weaning centers
WOB	work of breathing

Introduction

Introduction

Respiratory gas exchange is limited by the ability of the respiratory muscles to ventilate the lungs, and ventilation fails when the muscles cannot cope with the load imposed by the mechanics of the pulmonary system. It is important to understand the mechanics of breathing, not only to diagnose how the system has failed, and prescribe the correct treatment for the failure, but also to be able to provide the most effective temporary respiratory support using a mechanical ventilator **(Polese et al.,2012).**

There are many methods by which the patient and ventilator interact to perform the ventilatory cycle.These variable techniques are called modes of mechanical ventilation. They are volume targeted modes and pressure-targeted modes **(Bozyk et al., 2010).**

New modes of ventilation promote better oxygenation and faster weaning and be easier to use **(Eduardo et al., 2009).**

The physiology of patients with obstructive lung disease exacerbations presents a unique and complex challenge when these patients are placed on mechanical ventilation. Therefore, ventilator strategies that reduce hyperinflation are crucial **(Lougheed et al.,2006).**