

POSTOPERATIVE VENTILATORY SUPPORT (NEW CONCEPTS)

Essay Submitted for Partial Fulfillment of The Master

Degree of Anaesthesiology

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ABSTRACT

Many factors can cause postoperative pulmonary dysfunction. Considering ventilation, oxygenation, and airway maintenance as separate pulmonary functions facilitates identification of causative factors and selection of treatment. Clinicians employ many schemes and devices to improve postoperative pulmonary function. However, the single most important aspect of postoperative pulmonary care is getting the patient out of bed, preferably walking, as soon as is feasible postoperatively. Most mechanically ventilated postoperative patients have their ventilatory support discontinued within a day or two after surgery. However, some patients develop difficulties during the weaning process and require prolonged ventilation. Much effort has been spent for a proper, easy and successful weaning after anaesthesia and surgery.

Key words:

Physiology – Pathology – Respiratory failure – preoperative evaluation – spirometry – blood gas analysis – Benzodiazepines – Narcotics – Neuromuscular blockade – Mechanical ventilation (modes, indications, monitoring, complications) – Extracorporeal oxygenation – Liquid ventilation – weaning – occlusion pressure.

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LIST OF ABBREVIATIONS

A-aDO ₂	Alveolar-arterial Oxygen Gradient
A/CMV	Assist-Control Mechanical Ventilation
APRV	Airway pressure Release Ventilation
ARDS	Adult Respiratory Distress Syndrome
ASB	Assisted Spontaneous Breathing
BIPAP	Biphasic Positive Airway pressure
CMV	Controlled Mechanical Ventilation
CO	Cardiac Output
COPD	Chronic Obstructive Pulmonary Disease
CPAP	Continuous Positive Airway Pressure
CPPV	Continuous Positive Pressure Ventilation
CVP	Central Venous Pressure
DLV	Differential Lung Ventilation
ECMO	Extracorporeal Membrane Oxygenation
ERV	Expiratory Reserve Volume
FEF25%-75%	Forced Expiratory Flow over the middle half of the forced Vital Capacity
FEV1	Forced Expiratory Volume in 1 Sec

fIMV	IMV frequency
FIO ₂	Fraction of inspired Oxygen
FRC	Functional Residual Capacity
FVC	Forced Vital Capacity
Hb	Haemoglobin
HFJV	High Frequency Jet Ventilation
HFO	High Frequency Oscillation
HFPPV	High Frequency Positive Pressure Ventilation
HFV	High Frequency Ventilation
I:E Ratio	Inspiratory Expiratory Ratio
IC	Inspiratory Capacity
IMV	Intermittent Mandatory Ventilation
IPPV	Intermittent Positive Pressure Ventilation
IRV	Inverse Ratio Ventilation
IRV	Inspiratory Reserve Volume
P 0.1	Airway Occlusion Pressure
P _A	Alveolar Pressure
P _a CO ₂	Arterial Carbondioxide Tension
P _A O ₂	Alveolar Oxygen Tension

P_aO_2	Arterial Oxygen Tension
PB	Barometric Pressure
PC-IRV	Pressure Controlled-Inverse Ratio Ventilation
PCV	Pressure Controlled Ventilation
PEEP	Positive end Expiratory Pressure
$P_{ET}CO_2$	Carbondioxide Concentration at End-Exhalation
PLV	Pressure Limited Ventilation
P_{max}	Maximum Inspiratory Pressure
PIO_2	Inspired Oxygen tension
P_{Pa}	Pressure in the Pulmonary Artery
P_{Pl}	Pleural Pressure
P_{Pv}	Pressure In The pulmonary Vein
PSV	Pressure Support Ventilation
Q_s	Venous Admixture
Q_s/Q_t	Venous Admixture as a Fraction of Total cardiac Output
Q_t	Cartiac Output
RV	Residual Volume
S_aO_2	Arterial Oxygen saturation

SIMV	Synchronized Intermittent Mandatory Ventilation
SVO ₂	Mixed Venous Oxygen Saturation
T _E	Expiratory Time
T _I	Inspiratory Time
TLC	Total Lung Capacity
V/Q	Ventilation Perfusion Ratio
V _A	Alveolar Ventilation
VC	Vital capacity
VD	Dead Space Volume
VT	Tidal Volume
Vtrap	Trapped Volume