

COVID-19 AND CRITICAL CARE: WHAT PROVIDERS NEED TO KNOW MAY 1, 2020 UPDATE

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





COVID-19 Keeping Up With A Moving Target

Now, Twice Every Week @ COVID19.DKBmed.com

Every Wednesday Evening

C**VID-19**
KEEPING UP WITH A MOVING TARGET


Dr. Paul Auwaerter
Clinical Director
Division of Infectious Disease
Johns Hopkins University

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Every Friday Morning

C**VID-19**
KEEPING UP WITH A MOVING TARGET


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CME Information

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Learning Objectives

- Describe two indications for mechanical ventilation
- Distinguish between commonly used modes of mechanical ventilation
- State two common ventilatory alarms and the causes for each.

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Thank You

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Ventilator Management for Beginners: Part I

Agenda

- Indications for mechanical ventilatory support
- Mechanical ventilation (MV) and common terminology
- Common modes & settings of mechanical ventilation
- Common ventilator alarms & monitoring parameters





MV in COVID-19

MV-320/5700 (12%)

Died- 553/5700 (21%)

MV + Died-88%

Outcomes										
Length of stay, median (IQR), d*	4.1 (2.3-6.8)	2.0 (1.7-2.8)	3.8 (2.3-6.2)	4.5 (2.7-7.2)	NA	5.5 (2.9-8.4)	4.4 (2.1-7.1)	4.0 (2.4-6.2)	4.8 (2.5-8.1)	4.4 (2.3-8.0)
Discharged alive	3.9 (2.4-6.7)									
Died	4.8 (2.3-7.4)									
Died	553 (21)	NA	NA	NA	NA	NA	NA	NA	NA	N/A
Died, of those who did not receive mechanical ventilation	271/2314 (11.7)	NA	NA	NA	NA	NA	NA	NA	NA	
Died, of those who did receive mechanical ventilation	282/320 (88.1)									
Readmitted ^e	45 (2.2)	1 (3.1)	22 (1.6)	22 (3.3)	NA	NA	NA	NA	NA	NA
Discharge disposition of 2081 patients discharged alive										
No.	2081									
Home	1959 (94.1)	32 (100)	1345 (98.0)	582 (86.1)	NA	NA	NA	NA	NA	NA
Facilities (ie, nursing home, rehab)	122 (5.9)	0	28 (2.0)	94 (13.9)	NA	NA	NA	NA	NA	NA

Richardson S et al., JAMA, 2020

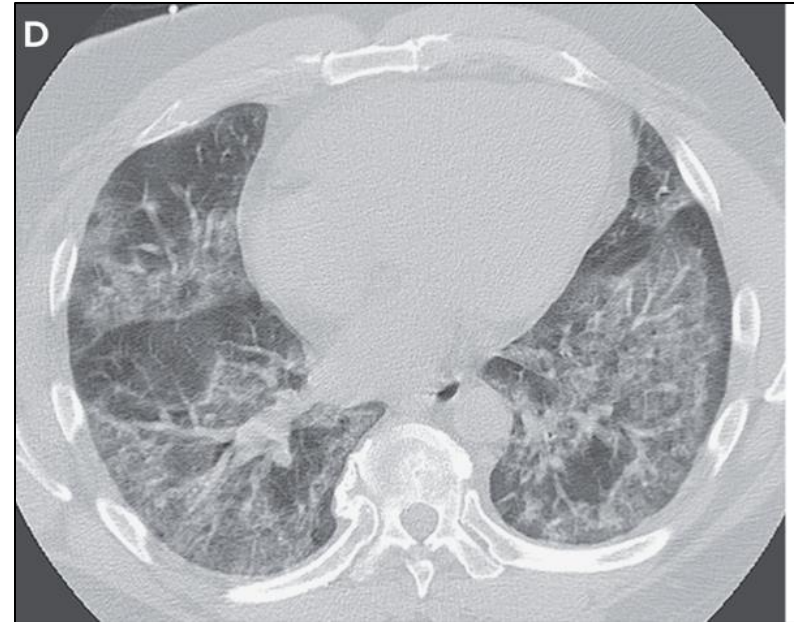
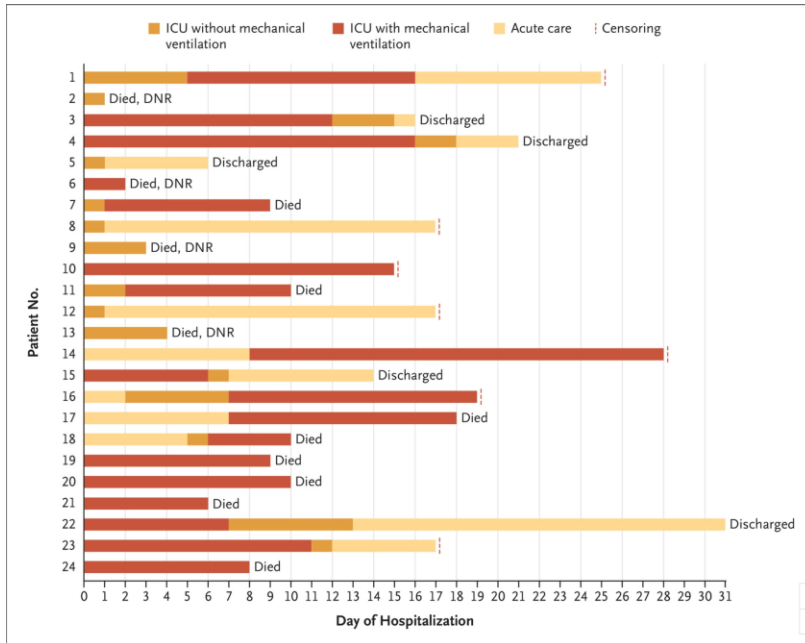
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MV in COVID-19



- 18/24 (75%)
- 23% bilateral patchy infiltrates
- 21 % had ground glass opacities
- Day 1 FiO2-90%

- Duration of MV 10 days
- Mortality rate 12/24 (50%)
- Age > 65% = 62%

Bhatraju BK et al., *NEJM*, 2020



Indications

- Airway control
- Impaired oxygenation & ventilation
- Procedural
- Acute respiratory failure
 - Trauma
 - Cardiac arrest
- Chronic respiratory failure
 - Neuromuscular disorders
 - Central nervous system disorders/injuries
 - Pulmonary disorders



MV - It's All About The Pressures

- Normal physiologic breathing occurs through a negative pressure circuit: air is *pulled* into the lungs by pressure gradients
- Mechanical ventilation is completely opposite process
- Positive pressure system: air is forcefully *pushed* air into the lungs by a machine



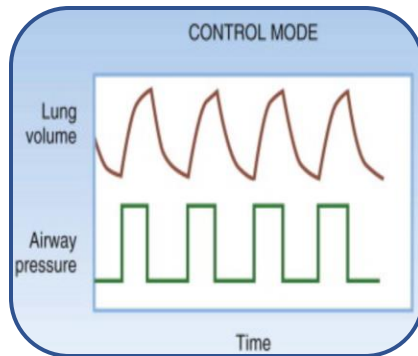
MV “Terminology”

- Mode ✓
- Respiratory rate (RR) ✓
- Tidal volume (V_t) ✓
- Minute ventilation (V_e)
- Plateau pressure (PP)
- Sensitivity ✓
- I:E ratio ✓
- FiO_2 ✓
- Positive end expiratory pressure (PEEP) ✓
- Compliance

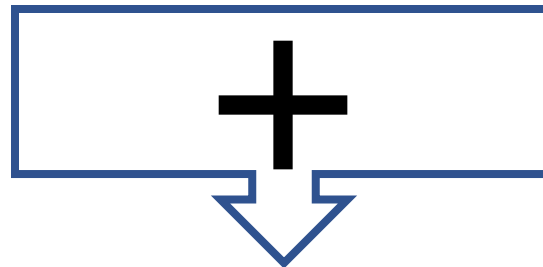
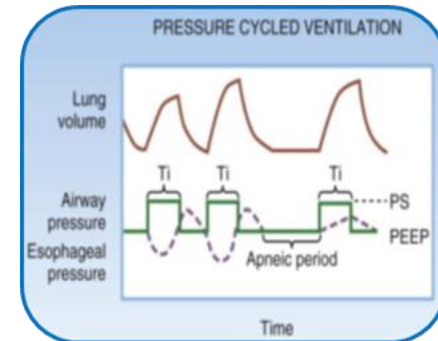


Modes of MV

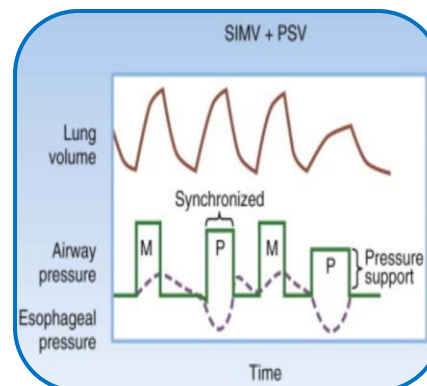
Volume Cycled (VC)
(Volume Control-CMV or AC)



Pressure Cycled (PC)
(Pressure Control-PC)



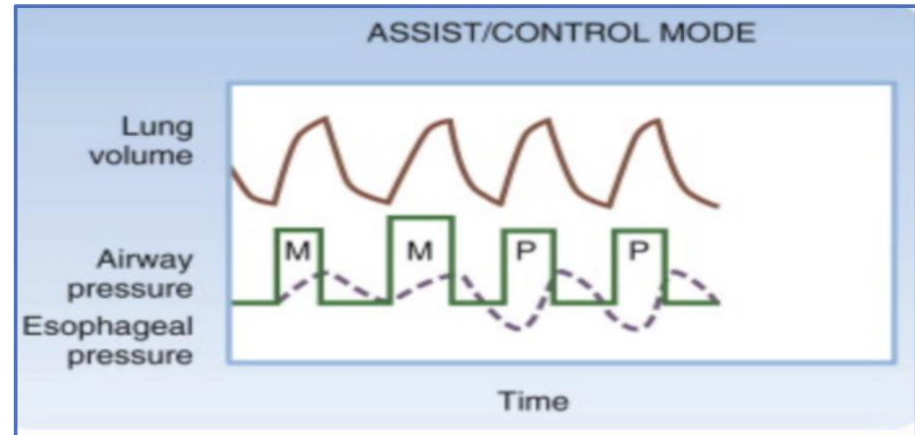
VC & PC
(SIMV + PS)



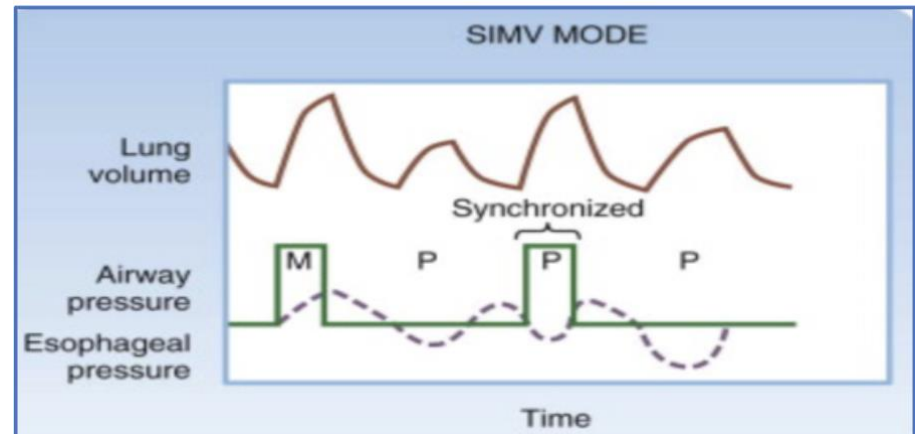


Common Modes of MV

Assist Control (AC)



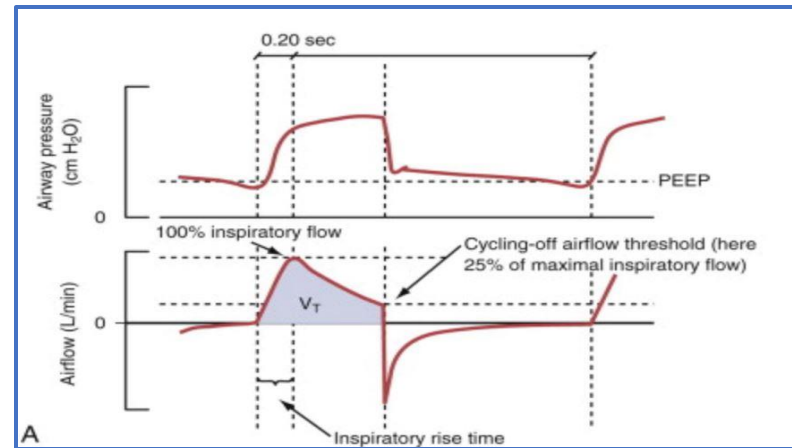
Synchronized
Intermittent
Mandatory
Ventilation (SIMV)



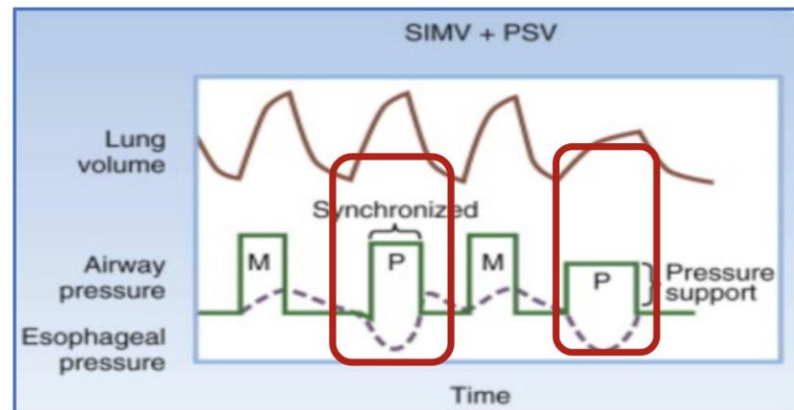


Common Modes of MV

Pressure Support Ventilation (PSV)



SIMV + PS





Common Ventilator Alarms

- High peak pressure
- Low peak pressure
- Low exhaled V_t
- High minute ventilation (V_e)
- Dislodgement
- Obstruction
- Pneumothorax
- Equipment failure



Monitoring Parameters

- Compliance
- Plateau Pressures (Pplat)
- Work of breathing (WOB)
- P/F ratio
- Driving pressure-(ΔP)
- Peak airway pressure-(PAP)



To submit your own question for Sue, please email
QA@dkbmed.com



What are major complications associated with mechanical ventilation in COVID patients?



**What can be done to prevent
ventilator-associated pneumonia?**



How are patients moved to and from operating rooms in crisis situations while using mechanical ventilation?



Can we use pressure control mode (PRVC) on the ventilator when proning COVID-19 patients?



What are the disadvantages of using pressure control mode (PRVC)?



**What are the advantages of using
ACVC mode for COVID-19 patients?**



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To ask your own question to Sue:

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