Basic Mechanical Ventilation Knowledge Test

Instructions for answer the test

1. Only one alternative is correct.
2. If you have no idea of the answer, mark “I don’t know”.

Legend:
RR: respiratory rate; ER: Emergency Room; PCV: Pressure Controlled Ventilation; PEEP: Positive End-Expiratory Pressure; PSV: Pressure Support Ventilation; TV: Tidal Volume; VCV: Volume Controlled Ventilation.

Good test.

* Indica uma pergunta obrigatória

1. 1. Regarding the subphases, triggering, and cycling of the ventilatory cycle, it can be stated that: *

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- (A) Ventilation is controlled when the triggering is initiated by the inspiratory flow.
- (B) Volume-cycled inspiration ends when the pre-set tidal volume is reached.
- (C) In pressure cycling, inspiration ends when the predetermined tidal volume is reached.
- (D) In assisted or spontaneous modes, the mechanical ventilator operator needs to choose the triggering method, which can be pressure or time.
- (E) I do not know.

2. 2. Pressure Support Ventilation (PSV) is a modality: *

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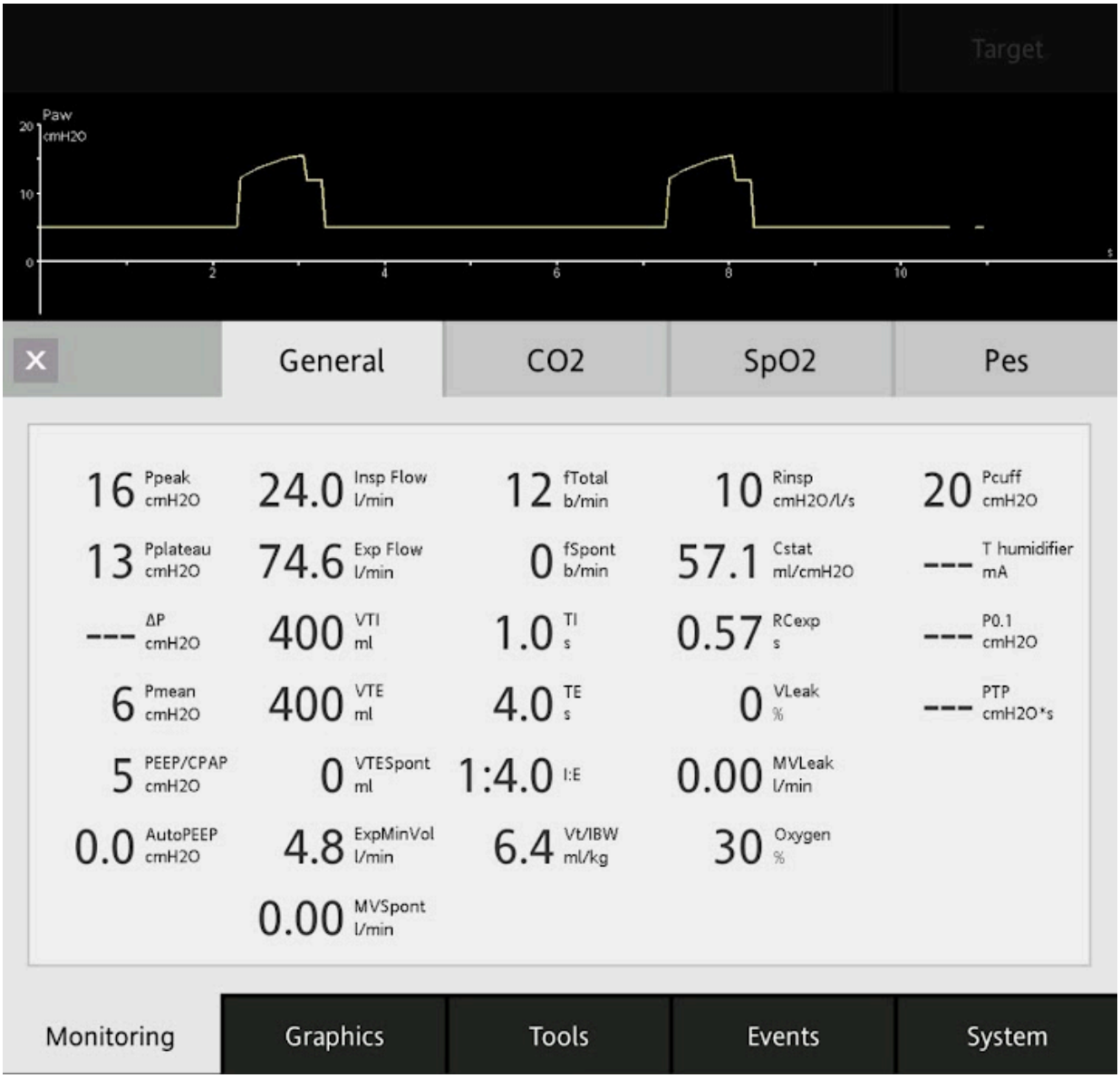
- (A) Controlled, time-triggered, flow-cycling and pressure-limited.
- (B) Spontaneous, patient-triggered by flow or pressure, cycling by flow and limited by pressure.
- (C) Assisted, time-triggered, flow-cycling and pressure-limited.
- (D) Spontaneous, patient-triggered by flow or pressure, pressure cycling and volume limited.
- (E) I do not know.

3. 3. Observe the image below obtained during the monitoring of the respiratory mechanics of a patient on invasive mechanical ventilation. Calculate the value of the driving pressure: *



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- (A) The driving pressure is 6 cmH2O.
- (B) The driving pressure is 8 cmH2O.
- (C) The driving pressure is 10 cmH2O.
- (D) The driving pressure is 11 cmH2O.
- (E) I do no know.

4. 4. A 60-year-old man on mechanical ventilation due to acute respiratory failure required analysis of respiratory mechanics in order to adjust ventilatory parameters to provide adequate ventilatory support. The ventilatory parameters at the time of analysis were: VCV mode, controlled mode, tidal volume of 500 mL, inspiratory flow of 30 L/min, constant flow wave type (square), PEEP of 8 cmH2O, respiratory rate of 12 bpm, FiO2 of 60%, peak pressure of 50 cmH2O and plateau pressure of 40 cmH2O. For this patient, it can be stated that the values of static compliance and airway resistance are, respectively: *

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- (A) 15,6 mL/cmH2O e 20 cmH2O/L/s.
- (B) 50 mL/cmH2O e 0,33 cmH2O/L/s.
- (C) 20 mL/cmH2O e 0,33 cmH2O/L/s.
- (D) 64 mL/cmH2O e 3 cmH2O/L/s.
- (E) I do no know.

5. 5. A 36-year-old male patient, 1.85 m tall, weighing 85 kg, was admitted to the ER due to a car accident. Due to a decreased level of consciousness (Glasgow 7), he was promptly placed on invasive mechanical ventilation. You were called to the emergency room to adapt the patient to a mechanical ventilator, opting for the VCV mode. What approximate tidal volume would you adjust to a volume of 6 ml/kg of this patient's predicted weight? *

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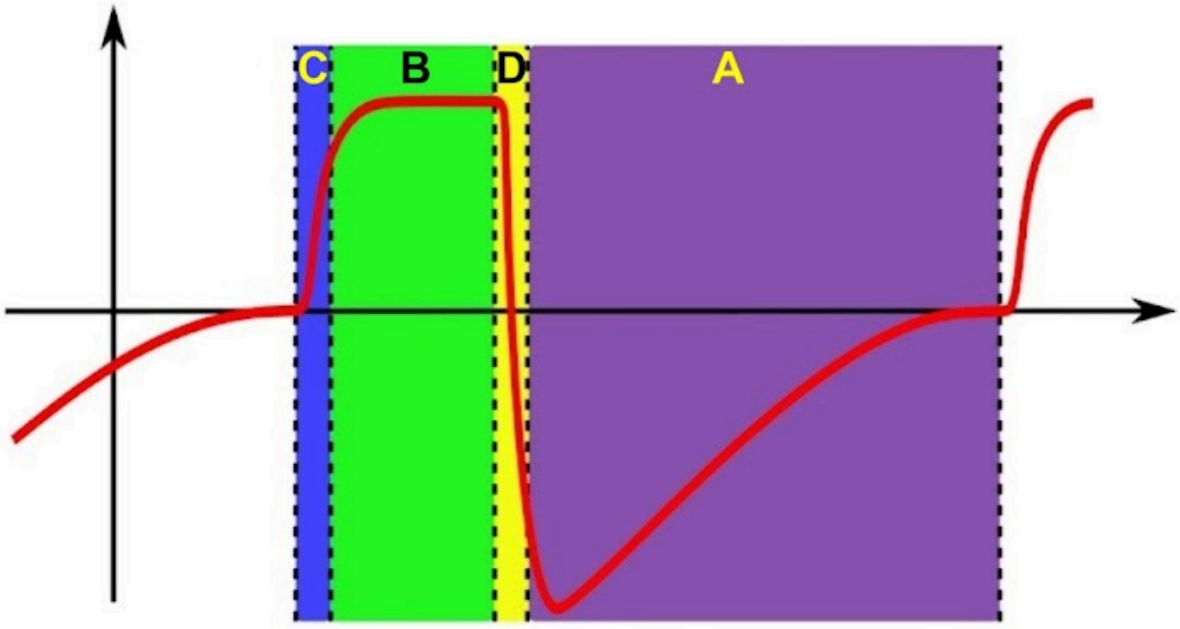
- (A) 310 ml.
- (B) 480 ml.
- (C) 540 ml
- (D) 600 ml.
- (E) I do not know.

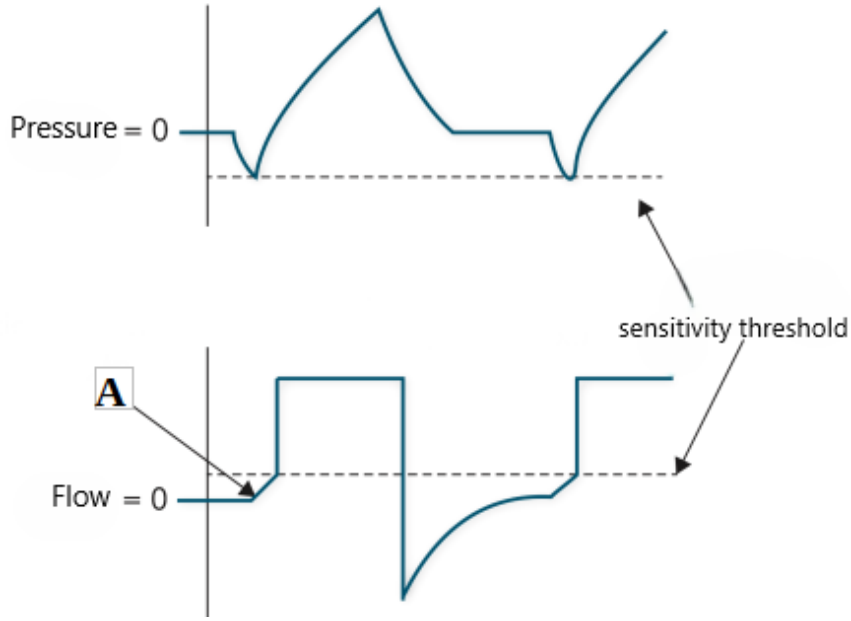
6. 6. The image below shows the Flow x Time graph and the phases of a ventilatory cycle that are separated by colors. According to the image, which letters correspond to the cycling and triggering of the mechanical ventilator, respectively? *



Marcar apenas uma oval.

- (A) A e C.
- (B) D e C.
- (C) B e A.
- (D) C e B.
- (E) I do not know.

7. 7. The figure below demonstrates pressure triggering and flow triggering. After analyzing the graphs, mark the alternative that corresponds to what the letter “A” represents. *



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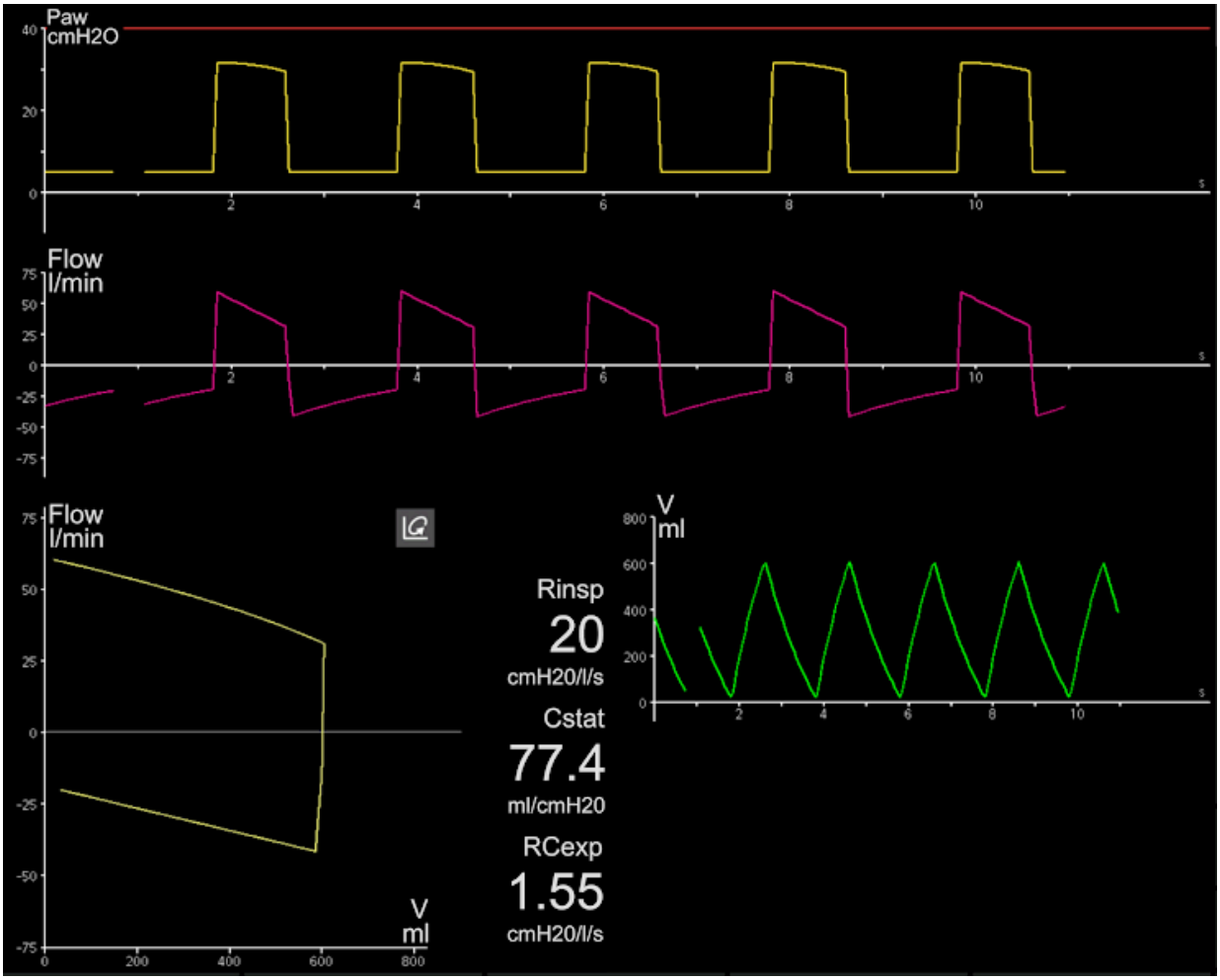
- (A) End of expiratory phase.
- (B) Beginning of patient effort.
- (C) Flow trigger.
- (D) Flow cycling.
- (E) I do not know.

8. 8. The figure below shows the screen of the mechanical ventilator of a patient admitted * to the Intensive Care Unit, intubated and mechanically ventilated. From careful observation of the adjusted ventilatory parameters and the scalar graphs, identify the ventilatory modality used in this patient.

Marcar apenas uma oval.

- (A) VCV, pressure cycled and fixed tidal volume.
- (B) PCV, time-cycled, limited to pressure and free tidal volume.
- (C) PSV, pressure cycled, flow limited and fixed tidal volume.
- (D) VCV, time-cycled, with fixed tidal volume and inspiratory flow.
- (E) I do not know.

9. 9. The figure below shows the scalar and loop graphs of Flow x Volume of an intubated patient on invasive mechanical ventilation. Based on the information provided by the graphs, it can be stated that there is the presence of: *



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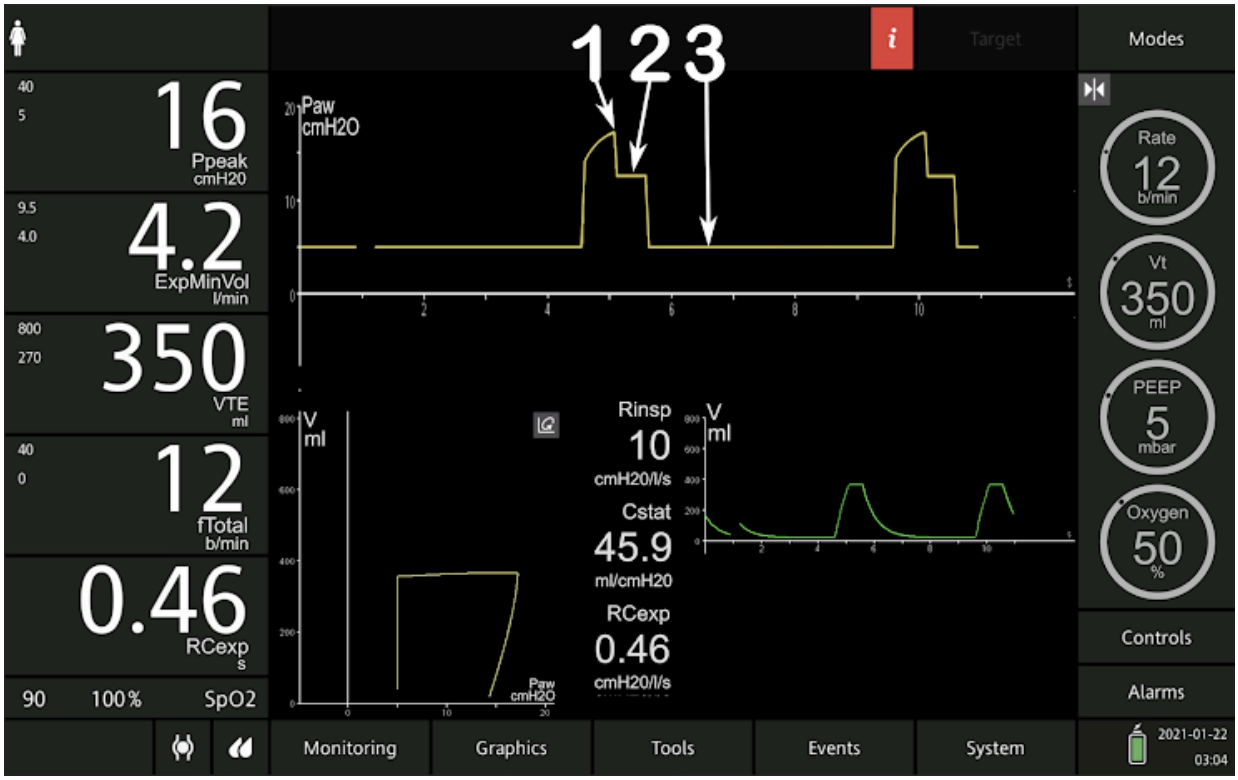
- (A) Intrinsec PEEP.
- (B) False trigger.
- (C)Air scape.
- (D) Ineffective triggering.
- (E) I do not know.

10. 10. Observe the adjusted ventilation parameters and the Pressure x Time graph in the image below. Then, select the alternative that correctly corresponds to the ventilation mode and the points indicated by numbers 1, 2 and 3, respectively: *



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- (A) VCV. 1 = Peak Pressure; 2 = Plateau Pressure; 3 = PEEP.
- (B) PCV. 1 = Plateau Pressure; 2 = Peak Pressure; 3 = Driving Pressure.
- (C) PSV. 1 = PEEP; 2 = Plateau Pressure; 3 = Driving Pressure.
- (D)VCV. 1 = Peak Pressure; Driving Pressure; 3 = PEEP.
- (E) I do not know.

11. 11. A patient with a predicted weight of 73 kg is intubated and being mechanically ventilated in VCV mode, with the following parameters: 620 ml tidal volume, RR of 15 bpm, flow of 40 L/min, PEEP of 5 cmH2O and FiO2 of 35%. Peak pressure of 40 cmH2O, plateau pressure of 35 cmH2O and absence of Intrinsic PEEP. Select the alternative that presents the appropriate change in a ventilatory parameter: *

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- (A) Increase PEEP.
- (B) Decrease inspiratory flow.
- (C) Increase respiratory rate.
- (D) Decrease tidal volume.
- (E) I do not know.

12. 12. A female patient, 1.62 m tall, 37 years old and weighing 64 kg, was intubated due to exacerbation and decompensation of a chronic lung disease. On the 3rd day of mechanical ventilation in the VCV mode, the following programmed variables were observed: TV: 330 ml, RR: 30 bpm, inspiratory time of 1s, extrinsic PEEP: 5 cmH2O, FiO2: 40% and intrinsic PEEP of 2 cmH2O was monitored. What is the appropriate conduct to correct intrinsic PEEP in this situation? *

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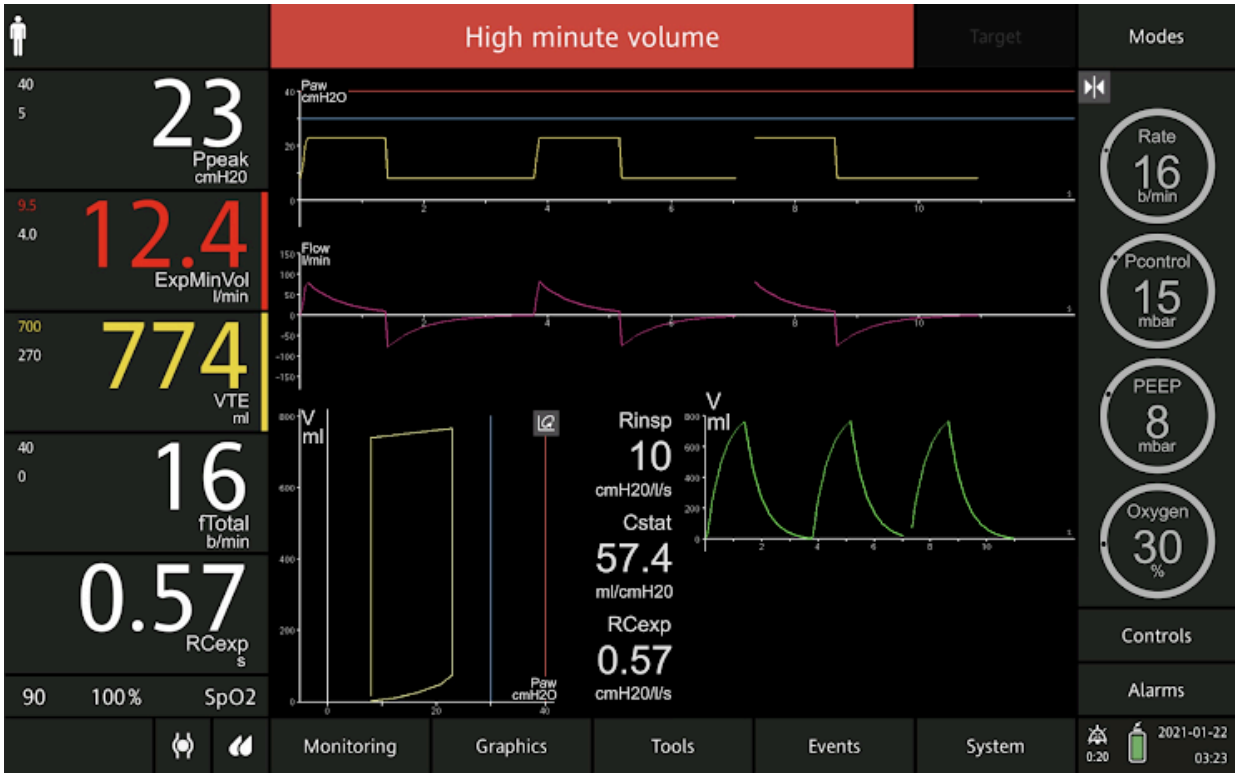
- (A) Decrease the RR.
- (B) Increase the TV.
- (C) Decrease PEEP.
- (D) Increase inspiratory time.
- (E) I do not know.

13. 13. Male patient, 1.80 m tall, weighing 90 kg, being mechanically ventilated in VCV mode, with the following parameters: TV: 450 ml, RR: 10 irpm, inspiratory flow: 40 L/min, Ti: 1.2 s and PEEP: 5 cmH2O. The I:E ratio was observed to be 1:4. To change the I:E ratio to approximately 1:2, it is necessary to: *

Marcar apenas uma oval.

- (A) Decrease the tidal volume to 400 ml.
- (B) Decrease the inspiratory time to 1s.
- (C) Increase the inspiratory flow to 50 l/min.
- (D) Increase the respiratory rate to 16 breaths per minute.
- (E) I do not know

14. 14. A 63-year-old male patient, 1.66 m tall, is being mechanically ventilated in PCV mode and in controlled mode. At a given moment, the ventilator begins to alarm, showing high minute and tidal volumes, as shown in the figure below. What is the appropriate conduct for this situation? *



Marcar apenas uma oval.

- (A) Decrease FiO2.
- (B) Increase RR.
- (C) Decrease delta pressure.
- (D) Increase inspiratory time.
- (E) I do not know.

15. 15. A 78-year-old male patient with a predicted weight of 72 kg was the victim of a domestic accident when he fell down a ladder, resulting in head trauma. The patient is sedated and mechanically ventilated in VCV mode, with: TV = 430 mL, RR = 15 bpm, Inspiratory flow = 30 L/min, PEEP = 5 cmH2O and FiO2 = 50%. His arterial blood gas analysis reveals PaO2 = 90 mmHg, PaCO2 = 40 mmHg and SaO2 = 96%. In order to reduce ICP (intracranial pressure), the physical therapist on duty needs to adjust a ventilatory parameter in order to reduce PaCO2 to approximately 35 mmHg. Select the option that indicates the change that should be made: *

Marcar apenas uma oval.

- (A) Decrease inspiratory flow.
- (B) Increase RR.
- (C) Decrease PEEP.
- (D) Decrease TV..
- (E) I do not know