



Non Invasive Ventilation (NIV)

Answers

1) A

By definition, NIV means there is no artificial airway needed like an endotracheal or tracheostomy tubes. NIV can be delivered via different interfaces like full face mask, nasal mask or prongs, or helmet.

2) C

Most of the contraindications for NIV are relative, however it is usually not recommended to use NIV in facial trauma, vomiting, hemodynamic instability, esophageal surgeries, severe agitation, or comatose state.

3) C

The indications for NIV have markedly expanded over the last decade to include various disease states including post operative respiratory failure, post extubation failure, post extubation prophylaxis in high risk patients, do not intubate orders.

However, the strongest evidence that is included in most guidelines are for acute exacerbations of COPD and acute cardiogenic pulmonary edema.

4) A

Reduced risk of ventilator associated pneumonia secondary to the artificial airway, the less requirement for sedation, and the use of NIV outside the ICU are amongst the most important benefits of NIV compared to invasive mechanical ventilation.

5) D

The benefits of NIV in acute cardiogenic pulmonary edema include improved FRC, reduced alveolar flooding, decreased preload and after load.

6) B

Oral diet or tube feeding are not contraindicated during NIV. The esophageo-gastric sphincter usually requires more than 25 cmH₂O pressure to open and cause reflux and vomiting. Though air can go to the stomach during NIV, it is usually with much less pressure, additionally the pressures used in NIV are less than 25 cmH₂O.

7) B

Most new generation critical care ventilators nowadays allow NIV as a separate mode. Older studies showed that dedicated NIV ventilators perform better in leak compensation, however, newer studies showed that critical care ventilator software might be at least equivalent if not superior to dedicated NIV machines.

8) B

Unfortunately, the nomenclature is not the same during NIV, and different ventilators settings might be different and it is crucial to know the machine you are using.

5/5 on some machines mean 0 pressure support (IPAP) and 5 cmH₂O PEEP (EPAP) resulting in Peak inspiratory pressure of 5 cmH₂O (basically CPAP 5), while on others it means 5 cmH₂O of pressure support (Δ pressure) and 5 cmH₂O, resulting in Peak inspiratory pressure of 10 cmH₂O.

9) B

Most of the spontaneous breaths during NIV are flow cycled, however in the S/T (Spontaneous/Time) mode or backup breath, if the patients' spontaneous respiratory rate falls below the minimum dialed, the breaths become controlled one with a certain inspiratory time (I-Time) thus a time cycled breath.

10) B

Asynchronies remain common during NIV and can lead to increased work of breathing, patient discomfort and failure of NIV.

Main reasons for asynchronies are due to uncompensated air leaks, auto-PEEP, high levels of pressure support and tidal volumes.