

HFOV: CO₂ removal

There is an inverse relationship between frequency (F) and tidal volume (TV):

$$F \approx 1/TV \rightarrow F \approx 1/\text{Amplitude}$$

Increasing frequency decreases amplitude → decrease in TV

Decreasing frequency increases amplitude → increase in TV

Pearl: HFOV differs from volume or pressure mode ventilation in that increases in respiratory rate decrease alveolar ventilation. Therefore, CO₂ elimination during HFOV will be improved by decreasing frequency.

Question:

Which of the following improves CO₂ elimination during high-frequency oscillatory ventilation?

- a. Absence of a cuff leak
- b. Decrease amplitude
- c. Decrease frequency
- d. Shorter inspiratory time

Answer: C - HFOV differs from volume or pressure mode ventilation in that increases in respiratory rate decrease alveolar ventilation. Therefore, CO₂ elimination during HFOV will be improved by decreasing frequency