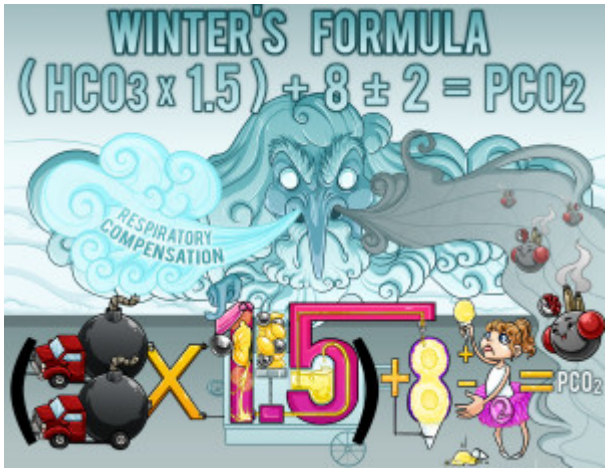
Winter's Formula

Winter's Formula is used to evaluate respiratory compensation when metabolic acidosis is present in a patient. This is used to give an expected value for the patient's PCO2, which helps to assess whether or not the patient is adequately compensating for their acidotic state. Winter's formula yields the expected PCO2 = (HCO3 x 1.5) + 8 ± 2.



PLAY PICMONIC

Evaluates Respiratory Compensation
Respiration Compensation
In cases of metabolic acidosis, the body should normally compensate physiologically. The normal PCO2 range is from 35-45, however, in cases of metabolic acidosis, it should change depending on the patient's bicarbonate (HCO3) level. Thus, the expected compensation can be calculated with this formula.

Used in Metabolic Acidosis
Metal-ball Acidic-lemon
Winter's Formula is primarily used in metabolic acidosis, and uses the patient's bicarbonate level (HCO3) to help calculate what the appropriate respiratory compensation should be.

Equation

(HCO3 x 1.5) + 8 plus-minus 2 = PCO2
Bi-car-bomb x 1.5 + 8 ± (2) Tutu = CO2-exhaust
Winter's Formula calculates the expected PCO2 value with respiratory compensation in cases of metabolic acidosis. The formula is (HCO3 x 1.5) + 8 ± 2, which yields the expected PCO2 value.

Steps

Bicarbonate (HCO3) x 1.5
Bi-car-bomb x 1.5
Initially the bicarbonate is multiplied by 1.5.

+ 8
+ 8 snow cone
Next, 8 is added to the value.

± 2
± (2) Tutu
This calculation is then given a range of ± 2.

= Expected Value for PCO2
CO2-exhaust
This should yield the expected value for PCO2 in a normal response to metabolic acidosis. This value should be compared to the patient's PCO2 value from their arterial-blood gas (ABG) analysis.