BASE EXCESS (DEFICIT)

The net metabolic component of the pH change in an arterial blood gas.

Step #1: How much of the pH change is due to the change in PCO_2?

For each change in PCO_2 of 10 mmHg, the pH will change by 0.08.

Step #2: Calculate expected pH from PCO_2 change and subtract from observed pH.

If > 0 → net metabolic alkalosis
If = 0 → no net metabolic component
If < 0 → net metabolic acidosis

Step #3: How much HCO_3 is needed to explain the difference between expected and observed pH?

For each change in HCO_3^- of 10 mEq/L, the pH will change by 0.15.

Example: ABG: pH = 7.28 PCO_2 = 30 PO_2 = 100

Step #1 ↓ PCO_2 of 10 mmHg → ↑ PH of .08

Step #2 Expected pH = 7.40 + .08 = 7.48
Observed pH - expected pH = 7.28 - 7.48 = -.20
→ net metabolic acidosis

Step #3 ↓ pH of .15 → ↓ HCO_3^- of 10 mEq/L
↓ pH of .20 → ↓ HCO_3^- of 13 mEq/L

→ Base Deficit = 13 mEq/L

NOTE: Easy short cut: It is calculated for you by the blood gas machine!

The Base Excess (or deficit) estimates the net metabolic component. It is NOT a good method to identify the presence of acid/base disturbances.

An equally severe metabolic acidosis and metabolic alkalosis will have a base excess of zero!

Usually there are more ABG's than SMA6's measured in ICU's. The Base Excess can help identify trends and may also help flag lab errors. A large change in Base Excess should trigger further evaluation, not necessarily treatment.