



Analytes

ALT, BUN, CL⁻, CRE, GLU, K⁺, NA⁺ and tCO₂

Ideal For

Serial testing, rechecks, fluid therapy and monitoring hospitalized patients

Used For

- Hospitalized patient monitoring
- An alternative panel to the Prep Profile II rotor for lower-cost pre-anesthetic testing
- Recheck panel for cases such as hyperadrenocorticism, diabetes and renal disease
- Early diagnostic information regarding acid-base status

The Value of tCO₂

Total carbon dioxide (tCO₂) measured in venous blood is equivalent levels of bicarbonate (HCO₃⁻) with a minor contribution from the ventilatory component. The clinician will gain a deeper understanding of the acid-base status of the patient without additional analyzers.

Acid-Base Analysis and the Interpretation of tCO₂

tCO₂ should be interpreted in light of history, signalment, physical examination, clinical signs and other laboratory data. A tCO₂ value outside the reference range is equivalent to a bicarbonate level outside the normal range. In general, this can be interpreted as:

tCO ₂ Decreased	Consistent with Metabolic Acidosis
tCO ₂ Increased	Consistent with Metabolic Alkalosis

If tCO₂ is abnormal, the clinician must determine whether complete acid-base analysis is warranted (measurement of pH, pCO₂, HCO₃⁻, Anion Gap, +/- Base Excess) or if the patient should be treated based on tCO₂ alone. This depends on availability of additional tests, patient condition, economics, original diagnosis, etc.

Many other entities, including electrolytes, proteins, ketones, lactic acid, uremic acids, and metabolites of ethylene glycol and HCO₃⁻ can affect the acid-base status of the patient. Additionally, the calculation of the anion gap can indicate the presence or absence of these entities.

$$\text{Anion Gap} = (\text{Na}^+ + \text{K}^+) - (\text{CL}^- + \text{tCO}_2)$$

An increased anion gap is most often seen with metabolic acidosis due to lactic, keto-, or uremic acids or the presence of other metabolites (ethylene glycol). A decreased anion gap is uncommon, and seen most frequently with hypoalbuminemia.

Rotor Utilization

Hospitalized Patient Monitoring

Hospitalized patients requiring fluid therapy benefit from a monitoring regimen that includes the critical care rotor because of the acid-base values and complete electrolyte profile. Examples include patients with renal disease and diabetic ketoacidosis where renal (BUN and CRE) and electrolyte (Na⁺, K⁺ and CL⁻) values along with understanding of the acid-base status are important. The rotor also allows evaluation of other important analytes such as GLU and ALT to monitor hepatic changes. The rotor can be used alone or in combination with other panels based on the clinician's judgment, clinical signs and laboratory results.

The economic benefits of the Critical Care Plus rotor allow for daily serial testing of hospitalized patients, and when used in combination with the Comprehensive Diagnostic Profile clinicians can monitor the patient with regard to the most necessary medical analytes.

Recheck and Follow-Up Examinations

Due to the lower cost of the profile, it can be used as a full-panel alternative to perform recheck examinations for certain conditions. For example, many clinicians perform annual or semiannual recheck evaluations on chronically ill patients with the Comprehensive Diagnostic Profile. Addition of the Critical Care Plus rotor in between those examinations provides an increased level of patient care at a more affordable cost to the client. Now you can obtain important values every 2-3 months to better monitor conditions that can rapidly change or deteriorate. For example:

- Renal disease
 - It is highly recommended by associations such as the American Association of Feline Practitioners¹ that acidosis is monitored in chronic renal disease patients. The availability of tCO₂ on this rotor fulfills this recommendation while monitoring other important values.
- Diabetes mellitus
- Addison's disease
- Cushing's disease
- Idiopathic hypokalemia (feline)

Pre-Anesthetic Evaluation

Many pre-anesthetic blood testing protocols include a chemistry panel that provides 6-chemistry-analyte testing. Replacement of that panel with the Critical Care Plus rotor provides additional values important to the anesthetic patient, such as electrolytes and tCO₂.

Young, healthy patients often have mild elevations in ALP due to the bone isoenzyme. Therefore, if elevated ALP is found with a normal ALT, it is not usually diagnostically relevant. The advantages of additional testing included on the Critical Care Plus profile are:

- Electrolytes Na⁺, K⁺, CL⁻ and blood gas tCO₂
- Metabolism
- Fluid balance and choice of fluid therapy
- Acid-base status
- Baseline for cardiac and/or respiratory emergency glucose
- Screen for hypoglycemia, especially in small, immature patients
- Screen for diabetes: GLU
- Screen for renal insufficiency: BUN and CRE
- Screen for underlying hepatopathy: ALT

¹American Association of Feline Practitioners Senior Care Guidelines—Revised 2008