**BUN/Creatinine Ratio**

**Interpretive Summary**

**Description:** The BUN/Creatinine Ratio is the blood urea nitrogen (BUN) divided by the creatinine. It is of limited use in determining whether azotemia is renal or pre renal in origin.

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**Decreased BUN/Creatinine Ratio**

**Common Causes**

- Decreased BUN with normal creatinine
  - Liver insufficiency/failure
  - Low protein diet
  - Severe polyuria/polydipsia (PU/PD)
    - Cushing’s disease
    - Diabetes mellitus
    - Diabetes insipidus

**Uncommon Causes**

- Increased creatinine with normal BUN
  - Acute myositis
  - Severe muscle trauma
  - Artifact (analyzer measures noncreatinine chromogens)
    - Ascorbic acid (Vitamin C)
    - Uric acid
    - Cephalosporins

**Related Findings**

- Liver insufficiency/failure
  - Decreased albumin, cholesterol, and glucose
  - Increased bilirubin, increased liver enzymes (e.g. ALT, AST, ALP, GGT)
  - Increased bile acid stimulation test/fasting ammonia
- Severe polyuria/polydipsia
  - Decreased urine specific gravity (isosthenuria, hyposthenuria)
  - Abnormal adrenal function tests (Cushing’s disease)
  - Glucose in urine (diabetes mellitus, renal tubular disease)
- Myositis/severe muscle trauma
  - Increased creatine kinase (CK)
  - Increased ALT/AST
  - Myoglobin in urine

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**Increased BUN/Creatinine Ratio**

**Common Causes**

- Increased BUN with normal creatinine
  - Early or mild prerenal azotemia (dogs and cats)
  - Gastrointestinal (GI) hemorrhage
  - High protein diet
  - Fever
Drugs (tetracyclines, corticosteroids)

- Decreased creatinine with normal BUN
  - Decreased muscle mass
    - Neonates
    - Severe cachexia

Related findings

- Early or mild prerenal azotemia
  - Increased urine specific gravity
  - Increased hematocrit
  - May have high normal sodium, chloride, total protein and creatinine
- Gastrointestinal hemorrhage
  - Non-regenerative anemia may be seen with chronic GI blood loss
  - Regenerative anemia is seen with GI blood loss until iron deficiency develops
  - Positive fecal occult blood

Additional Information

Physiology

- The ratio of BUN to creatinine will change with increases or decreases in either component (see also BUN and creatinine interpretive guides).
- The BUN/Creatinine ratio originally was thought to be of value in discriminating between renal and pre-renal azotemia but there is significant overlap in values for the ratio in these two conditions.
- There are too many variables for the ratio itself to be used as a critical diagnostic parameter. If the ratio is abnormal the clinician should evaluate each individual parameter to determine the reason
- In dogs and cats, BUN may be more influenced by pre-renal effects on tubular reabsorption and diffusion rate, and effects of diet and protein metabolism than is creatinine. This does not apply to horses.

References


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