What Do You NEED to Diagnose and Monitor Chronic Kidney Disease in Dogs and Cats

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There is no single test that alone accurately diagnoses chronic kidney disease (CKD). When evaluating a patient for chronic kidney disease it is important to consider ALL of the following information:

**Signalment & History**
History can provide indicators that renal failure may be occurring.
- 55% of cats 5-20 years of age are positive for chronic kidney disease, based on IRIS guidelines.¹,²
- Changes in water intake and urine output
- Body weight changes
- Alterations in appetite and activity levels
- Vomiting, constipation or diarrhea

**Physical Examination**
- Assess renal size, symmetry and shape
- Perform preventive blood pressure screening, especially in older cats and dogs.

**Laboratory Testing**
Annual or semi-annual preventive blood testing should be performed, especially in senior/geriatric patients, regardless of history or physical exam findings.

**Creatinine (Cr):** may be influenced by the animal’s muscle mass
- Small changes in creatinine can be significant. For this reason patient trending for kidney values throughout the animal’s life can be very useful in detecting early CKD.
- Trending Cr values is important, as small changes, if performed by the same laboratory equipment, may indicate a significant change in kidney function.
- IRIS recommends evaluating Cr >1.1 in dogs or >1.6 in cats for chronic kidney disease.³
- Creatinine normal reference ranges can be interpreted differently for senior or geriatric patients:
  - Feline: from 0.3-2.1 mg/dl à 0.3 to 1.5 mg/dl ⁴
  - Canine: from 0.3-1.4 mg/dl à 0.3 to 1.3 mg/dl ⁴

**Blood Urea Nitrogen (BUN):** is a non-toxic form of ammonia.
- Not influenced by muscle mass
- Can be decreased with concurrent liver disease or increased with high protein diet, gastrointestinal bleeding

**Phosphorus**: studies have shown keeping phosphorus <4.7ug/dl helps slow the progression of CKD. Phosphorus >4.7ug/dl supports progression of CKD.⁵

**Electrolytes:** can become abnormal and require correction with fluid therapy

**Ionized Calcium (iCa):** useful for monitoring/treating secondary hyperparathyroidism, seen with CKD.

**Urinalysis:**
- Should be performed anytime a chemistry profile is being performed.
- A USG <1.030 in dogs and <1.035 in cats with azotemia (BUN and/or Cr elevated) is indicative for CKD.⁶
  - Monitoring serial USG changes can help catch early CKD, sometimes prior to serum BUN or Cr elevations.
- Urine sediment evaluation may provide information regarding concurrent or underlying disease, such as a urinary tract infection.

**Urine Protein:Creatinine Ratio (UPC):** helps classify IRIS stage of CKD.

**Microalbuminuria:** highly sensitive indicator of early glomerular damage. If elevated, monitor and evaluate UPC and pre and post-renal causes of proteinuria.

**Abdominal Imaging**
**Algorithm for Monitoring Renal Disease**

1. Evaluate patient with an in-house Complete Blood Count, Chemistry and Urinalysis

2. Is Creatinine > 1.1 (Canine) or 1.6 (Feline)?
   - No: No evidence of early kidney changes, recommend re-evaluation in next 6-12 months unless physical symptoms change
   - Yes: Concerns of early kidney disease (IRIS Stage 2) – 40% loss of renal function.
     - Recommend evaluating:
       - Blood Pressure
       - Urine Protein / Creatinine Ratio

3. Is USG < 1.030 (Canine) or 1.035 (Feline)?
   - No: Kidney disease may still be present (especially in felines)
     - Recommend to evaluate renal function again in next 60-90 days
     - If values are still increasing, recommend abdominal radiographs to evaluate for kidney stones
   - Yes: Urine is still concentrating

**Plan:**
- Continue to monitor renal function at regular intervals
- Consider low Phosphorus diet
- Treat if patient if hypertensive or has significant protein loss in the urine

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1. IRIS is the International Renal Interest Society. They provide guidelines for diagnosis and monitoring of chronic kidney disease in dogs and cats.
3. Laboratory values provided are for guideline purposes only. Exact values/ranges may differ depending on the manufacturer of laboratory equipment used to measure biochemical analytes.
4. Ranges listed are specific to the Abaxis VetScan VS2, as they relate to IRIS staging guidelines. Exact values/ranges may differ depending on the manufacturer of laboratory equipment.